

Operational Risk Auditing and Financial
Performance of General Insurance
Companies in Kenya and Zimbabwe: The
Moderating Role of Risk Governance

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Research Article

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Abstract

Introduction: Failures in processes, people, and systems can erode insurers' profitability, yet little is known about whether disclosed audit arrangements for operational risk are associated with performance, or whether that association depends on how boards govern risk. Drawing on agency and contingency theory, this study examines the within-insurer association between disclosed operational risk auditing and the financial performance of general insurers in Kenya and Zimbabwe, as well as the moderating role of disclosed risk governance.

Methodology: The study analyses an unbalanced panel of 49 general insurers, comprising 461 firm-year observations, over 2015–2024, using audited annual reports and regulator publications. Operational risk auditing and risk governance are measured using disclosure-based indices, while financial performance is measured by return on assets. Fixed-effects regressions with insurer-clustered standard errors, supported by small-cluster corrections, are used to estimate the associations and test the moderating role of governance.

Results: A 0.10 higher auditing index is associated with a 1.13 percentage-point higher return on assets, while a 0.10 higher governance index is associated with a 0.40 percentage-point higher return on assets, although the governance association is less stable across robustness checks. The

association between auditing and performance increases with governance: it is not detected where disclosed governance is weak, but is larger where governance is strong. Evidence of a country difference is limited to a steeper moderation slope in Zimbabwe at high governance levels, and this result is not robust to country-by-year effects.

Conclusion: The findings suggest that operational risk audit and risk-governance arrangements should be considered together when assessing insurer performance. However, the disclosure-based indices measure disclosed arrangements rather than verified quality, and the research design does not establish causation. In the search described in the paper, no earlier study was found that tests risk governance as a moderator of the auditing–performance association or compares general insurers in Kenya and Zimbabwe.

Keywords: operational risk auditing; risk governance; financial performance; general insurance; Kenya; Zimbabwe; moderation

1. Introduction

Insurers are risk-bearing institutions whose survival depends on managing not only underwriting and investment risk but also operational risk, defined as the risk of loss from inadequate or failed internal processes, people and systems, or from external events (Basel Committee on Banking Supervision, 2011). Operational failures are costly. Cummins, Lewis and Wei (2006) found that announcements of operational losses by US banks and insurers were followed by market value losses that significantly exceeded the announced losses, with a larger response for insurers. Because insurance supports economic growth through risk pooling

and long-term capital mobilisation (Arena, 2008; Outreville, 2013), the

operational resilience of insurers matters beyond the firms themselves.

Internal audit is a main mechanism for monitoring operational risk, and higher internal audit quality has been linked to lower earnings management (Prawitt, Smith and Wood, 2009). Power (2007) cautions, however, that auditing of risk can become ritualised, producing assurance that satisfies procedure without improving decisions. Evidence on whether risk management improves insurer performance is also mixed (Hoyt and Liebenberg, 2011; McShane, Nair and Rustambekov, 2011), and its

benefits depend on firm-specific contingencies (Gordon, Loeb and Tseng, 2009). These findings suggest that any association between audit arrangements and performance may depend on the governance structures that determine whether audit findings are acted upon.

Risk governance, meaning board-level oversight of risk through risk committees, chief risk officers and clear accountability, is one such structure. Governance characteristics are associated with insurer risk-taking (Eling and Marek, 2014), and banks whose chief risk officers reported directly to the board had higher stock returns and return on equity during the financial crisis (Aebi, Sabato and Schmid, 2012). From an agency perspective, audit can reduce information asymmetry between owners and managers (Jensen and Meckling, 1976), and this may matter more where governance gives audit findings the authority to change management behaviour (Eisenhardt, 1989). Risk governance may therefore strengthen the association between operational risk auditing and performance, a moderating relationship of the form specified by Baron and Kenny (1986). In this study both

constructs are measured through what insurers disclose about their audit and board arrangements. The study therefore examines disclosed arrangements, not verified audit quality or governance effectiveness.

Kenya and Zimbabwe offer a useful contrast for testing this argument. In 2024, total insurance penetration was 2.45% of GDP in Kenya (Insurance Regulatory Authority, 2025) and about 2% in Zimbabwe (Insurance and Pensions Commission, 2025). Both regulators require insurers to maintain internal audit and risk management functions. In Kenya these requirements were set out in the Insurance (Risk Management and Control Functions) Guidelines, 2022 (Republic of Kenya, 2022). In Zimbabwe the Insurance and Pensions Commission set them out in its Directive on Systems of Governance and Risk Management for Insurance Companies, issued in 2016 and replaced in 2022 (Insurance and Pensions Commission, 2016; 2022). Because both sets of requirements took effect within the study period, changes in disclosure over time may partly reflect regulation. The operating environments differ, however. Zimbabwe experienced one of the worst hyperinflations on record (Hanke

and Kwok, 2009), relaunched its own currency in 2019 and replaced it with the gold-backed ZiG in April 2024 (Reuters, 2024). Such instability also affects how comparably profits and assets are reported, an issue addressed in the methodology. These conditions make it plausible that the audit–performance association differs between the two markets.

Existing African evidence covers only parts of this question. In Kenya, operational risk management (Kiptoo, Kariuki and Ocharo, 2021) and internal audit controls (Okemwa, 2025) are associated with better insurer performance, and risk-based internal audit approaches have been examined with firm size as a moderator, which was not significant (Were, 2023). In South Africa, corporate governance characteristics moderate the relationship between enterprise risk management and insurer performance (Horvey and Odei-Mensah, 2024). In Zimbabwe, studies have focused on board characteristics (Sandada, Manzanga and Shamhuyenzva, 2015). A search of web-indexed journal and institutional-repository sources in October 2026, combining the terms internal audit, operational risk, risk governance, moderating, insurance,

Kenya and Zimbabwe, did not identify a study that tests risk governance as a moderator of the relationship between operational risk auditing and financial performance, or one that compares general insurers in Kenya and Zimbabwe. This study addresses these gaps by estimating the within-insurer association between disclosed operational risk auditing and financial performance, how that association varies with disclosed risk governance, and whether it differs between the two markets. As an observational study of disclosures, it does not establish causal effects or test the mechanisms, such as reduced claims leakage or board action on audit findings, through which theory suggests auditing and governance operate.

2. Research Objectives and Hypotheses

Main Objective: To examine the association between operational risk auditing and the financial performance of general insurance companies in Kenya and Zimbabwe, and the moderating role of risk governance in that association.

Sub-Objectives:

1. To estimate the within-insurer association between disclosed operational risk auditing and the

financial performance of general insurers.

2. To estimate the within-insurer association between disclosed risk governance and the financial performance of general insurers.
3. To determine whether the association between operational risk auditing and financial performance varies with the level of disclosed risk governance.
4. To compare these associations, and the moderating role of risk governance, between the Kenyan and Zimbabwean insurance markets.

Research Hypotheses:

H1: Disclosed operational risk auditing is positively associated with the financial performance of general insurers, measured by return on assets, after accounting for insurer and year effects.

H2: Disclosed risk governance is positively associated with the financial performance of general insurers, measured by return on assets, after accounting for insurer and year effects.

H3: The positive association between disclosed operational risk auditing and financial performance is stronger at

higher levels of disclosed risk governance.

H4a: The association between disclosed operational risk auditing and financial performance differs between Kenya and Zimbabwe at common levels of risk governance.

H4b: The association between disclosed risk governance and financial performance differs between Kenya and Zimbabwe at common levels of operational risk auditing.

H4c: The moderating role of risk governance in the association between operational risk auditing and financial performance differs between Kenya and Zimbabwe.

H1 and **H2** are assessed by the sign and 5% significance of the relevant coefficients. **H3** is assessed by the interaction coefficient. **H4a** to **H4c** are two-sided, because theory predicts a difference between the markets but not its direction. A joint test of the three country-difference parameters is reported as an omnibus check, and each hypothesis is then assessed separately.

3. Literature Review

3.1 Operational risk auditing

Operational risk auditing is the independent evaluation of how an

organisation identifies, assesses and controls losses arising from failed processes, people, systems and external events. It sits within the broader remit of internal audit, which the Institute of Internal Auditors (2017) describes as independent and objective assurance and consulting activity that evaluates and improves the effectiveness of risk management, control and governance processes. Lenz and Hahn (2015) synthesise the empirical literature on internal audit effectiveness, which provides the benchmark for judging whether risk-focused auditing improves organisational outcomes. In this study the construct is observed through disclosure. It refers to what insurers report about their internal audit arrangements for operational risk, not to the verified quality of the audit work.

The evidence that audit adds value is encouraging but indirect. Prawitt, Smith and Wood (2009) link higher internal audit quality to lower earnings management, which indicates better control over the reporting process. In Kenya, operational risk management has been associated with better insurer performance (Kiptoo, Kariuki and Ocharo, 2021), as have internal audit controls (Okemwa, 2025), while Were

(2023) examined risk-based internal audit approaches among listed insurers, with firm size as a moderator that proved not significant. These studies examine risk management, internal audit controls or risk-based audit approaches broadly. Among the studies we identified (Section 3.4), none examines operational risk auditing as a distinct construct or tests whether its association with performance depends on risk governance. Power (2007) offers a reason for caution: where risk auditing becomes ritualised, organisations may produce documentary assurance without changing how risks are managed. The association between audit and performance therefore cannot be assumed. In principle, an audit that identifies control weaknesses in underwriting, claims handling, reinsurance administration and information systems could reduce avoidable losses and leakages. That mechanism is a theoretical proposition, and this study does not measure losses, leakages or remediation.

3.2 Risk governance

Risk governance refers to the structures through which a board oversees and holds management accountable for risk, including risk

committees, a chief risk officer (CRO) and defined reporting lines. Studies of adoption link enterprise risk management (ERM) to firm characteristics. Beasley, Clune and Hermanson (2005) find that the extent of ERM implementation is greater where a CRO is present and top management supports ERM. Liebenberg and Hoyt (2003) find that firms with greater financial leverage are more likely to appoint a CRO, and Pagach and Warr (2011) find that larger, more volatile firms with greater institutional ownership are more likely to do so. Evidence on outcomes is stronger in banking than in insurance. Aebi, Sabato and Schmid (2012) find that banks whose CRO reports directly to the board rather than to the chief executive had higher stock returns and return on equity during the financial crisis, and Ellul and Yerramilli (2013) find that bank holding companies with stronger risk management functions had lower risk and better operating performance. In insurance, Hoyt and Liebenberg (2011) report a value premium for ERM, whereas McShane, Nair and Rustambekov (2011) find that insurer value rises with traditional risk management capability but that higher levels of ERM sophistication do not carry a further premium. Eling and

Marek (2014) show that governance characteristics are related to the risk-taking of UK and German insurers. Horvey and Odei-Mensah (2024) find that board size, board independence and gender diversity moderate the relationship between ERM and the performance of South African insurers. In Zimbabwe, Sandada, Manzanga and Shamhuyenhonzva (2015) studied board characteristics and performance in non-life insurers, and Mahwe (2024), in a master's dissertation, reports that the effectiveness of ERM is related to the financial performance of short-term insurers.

Among the studies we identified, none examines how risk governance conditions the association between operational risk auditing and performance. Contingency perspectives argue that risk management practices yield benefits only when they fit the organisational setting (Gordon, Loeb and Tseng, 2009). Agency theory similarly implies that monitoring is more effective where those who receive its output can act on it (Eisenhardt, 1989). A board risk committee that reviews audit reports, and a CRO with the standing to challenge management, could convert audit findings into corrective action,

whereas without them findings may be reported but not remedied. These are proposed mechanisms. The disclosure indices used here do not observe whether findings were acted on.

The boundary between the two constructs needs care. Audit committee oversight, meeting frequency and the follow-up of audit findings lie between audit and governance, because they describe how audit output is overseen and acted on, which is also the corrective-action role attributed to risk governance. This study therefore treats the two indices as related but distinct disclosure constructs. Section 4.4 sets out which items are assigned to each and tests whether the results are sensitive to items that sit at the boundary.

3.3 Financial performance of general insurers

Studies of insurer performance typically measure profitability using return on assets (ROA) or return on equity, and underwriting performance using loss, expense and combined ratios. Firm-level determinants recur across markets, but their signs and significance differ. Shiu (2004) finds that liquidity, unexpected inflation, the interest rate level and underwriting

profits are significant determinants of the performance of UK general insurers. Malik (2011) finds that size and volume of capital are positively related to the profitability of Pakistani insurers, loss ratio is negatively related, and age is not significant. For Kenyan general insurers over 2009–2012, Mwangi and Murigu (2015) find that profitability, measured by ROA, rises with leverage, equity capital and management competence and falls with company size and ownership structure, while retention ratio, liquidity, underwriting risk and age were not significant.

These findings guide the choice of control variables (firm size, leverage, liquidity and age), which are included so that the associations of interest are not confounded with basic firm characteristics. Because the signs differ across settings, the controls are treated as conditioning variables, not as tested hypotheses. Other time-varying insurer characteristics identified in this literature, such as underwriting experience, reinsurance arrangements, capital position and business mix, are not all controlled in the main models. Some of them may lie on the path from audit and governance to profitability, so adding them indiscriminately could

absorb part of the association of interest. Their inclusion is therefore examined as a sensitivity analysis, not as part of the main specification.

3.4 The Kenyan and Zimbabwean context

Both markets set requirements for the functions this study examines. In Kenya, the Insurance (Risk Management and Control Functions) Guidelines, 2022 set out requirements for risk management and internal control (Republic of Kenya, 2022). In Zimbabwe, the Insurance and Pensions Commission issued its Directive on Systems of Governance and Risk Management for Insurance Companies in 2016 and replaced it in 2022 (Insurance and Pensions Commission, 2016; 2022). Because both sets of requirements took effect within the study period, changes in disclosure over time may partly reflect regulation, and the study cannot separate compliance-driven disclosure from changes in audit or governance practice. Statutory Instrument 44 of 2026 reforms solvency, governance and risk management requirements for Zimbabwean insurers (Muvingi Mugadza, 2026), but it came into force after the observation period and is context only. In 2024, total insurance

penetration was 2.45% of GDP in Kenya (Insurance Regulatory Authority, 2025) and about 2% in Zimbabwe (Insurance and Pensions Commission, 2025). Regulation is therefore broadly similar in direction. The macroeconomic setting is not. Zimbabwe has experienced hyperinflation (Hanke and Kwok, 2009) and repeated currency changes, most recently to the gold-backed ZiG in April 2024 (Reuters, 2024). Mahwe (2024) notes that this history raised the importance of risk management among Zimbabwean financial institutions. Such instability affects how reliably reported profits and asset values reflect performance, raises accounting comparability questions that are addressed in Section 4, and may change how much insurers can gain from strengthening controls. Kenya has operated in a comparatively stable currency environment. These differences give a reason to expect that the associations may differ between the two markets, which motivates H4a to H4c, although theory does not predict the direction of the difference.

Existing work links risk management, audit controls and board characteristics to insurer performance, mostly in separate studies, in single countries,

and with limited attention to operational risk auditing as a distinct construct. A search of web-indexed journal and institutional-repository sources in October 2026, combining the terms internal audit, operational risk, risk governance, moderating, insurance, Kenya and Zimbabwe, did not identify a study that tests risk governance as a moderator of the relationship between operational risk auditing and financial performance, or one that compares general insurers in Kenya and Zimbabwe. The hypotheses in Section 2 address these gaps.

3.5. Theoretical Underpinnings

This study draws on two complementary theories. Agency theory offers a reason why disclosed operational risk auditing may be positively associated with the financial performance of insurers. Contingency theory offers a reason why that association may depend on risk governance and on the national setting.

3.5.1 Agency Theory

Agency theory treats the firm as a nexus of contracts in which owners (principals) delegate decisions to managers (agents) whose interests may diverge from their own (Jensen

and Meckling, 1976). Since principals cannot directly observe managerial effort or risk-taking, they bear monitoring and bonding costs to limit opportunistic behaviour (Eisenhardt, 1989). Fama and Jensen (1983) add that the board exists to ratify and monitor managerial decisions on behalf of owners.

The agency problem is acute in general insurance. Underwriting, claims handling, reserving and reinsurance are complex activities, and the information needed to judge them is held by management rather than by shareholders or policyholders. Operational risk auditing is a monitoring mechanism that can give principals independent information on whether internal processes, people and systems are working as intended. It may reduce information asymmetry, discourage control lapses and lower losses from process failure. This motivates H1.

Agency theory also motivates H2 and H3. Risk governance structures, such as board risk committees and a CRO with direct access to the board, are the channels through which monitoring information may reach principals and be acted upon. Audit findings that do not reach the board cannot constrain

management, so governance is expected to be positively associated with performance (H2) and to strengthen the association of auditing with performance (H3). These are theoretical propositions. The study observes disclosed structures, not monitoring intensity or managerial responses.

3.5.2 Contingency Theory

Contingency theory holds that no single organisational arrangement is best in all circumstances; performance depends on the fit between structures and the setting in which they operate (Lawrence and Lorsch, 1967; Donaldson, 2001). Drazin and Van de Ven (1985) distinguish selection, interaction and systems conceptions of fit. The interaction conception is the relevant one here, since it expects the association of one practice with outcomes to vary with the level of another. In research on control systems, Chenhall (2003) shows that the design and benefits of controls depend on organisational context, and

Gordon, Loeb and Tseng (2009) find that the performance benefit of enterprise risk management depends on its fit with firm-specific factors.

This perspective motivates H3 and H4a to H4c. The value of operational risk auditing may be contingent on the strength of risk governance (H3) and on the wider environment in which insurers operate (H4). Kenya and Zimbabwe differ in macroeconomic stability and currency history (Hanke and Kwok, 2009; Reuters, 2024), so identical audit and governance arrangements may be associated with different outcomes in each market. This is consistent with Power's (2007) observation that risk auditing delivers value only when it influences decisions and not merely procedure. A positive interaction between two disclosure indices is consistent with complementarity, but it does not show that boards implemented audit findings. Contingency theory supplies a rationale for the interaction, not evidence of the mechanism.

Table 3.1: Integration of the Theories

<i>Theory</i>	<i>Core proposition</i>	<i>Role in this study</i>	<i>Hypotheses</i>
<i>Agency theory</i>	Monitoring reduces information asymmetry	Offers a reason for the direct associations of	H1, H2

<i>Theory</i>	<i>Core proposition</i>	<i>Role in this study</i>	<i>Hypotheses</i>
	and managerial opportunism	auditing and governance with performance	
<i>Contingency theory</i>	Effectiveness depends on fit with the organisational and national setting	Offers a reason for moderation by risk governance and for differences between markets	H3, H4a– H4c

Source: Authors' conceptualisation (2026)

3.5.3 Conceptual Framework

The framework links disclosed operational risk auditing (independent variable) to financial performance (dependent variable), with disclosed risk governance as a moderator of that association. Risk governance is also directly associated with financial performance. Firm size, leverage, liquidity and age are included as control variables. The model is estimated for the pooled sample with country interaction terms, and separately for Kenya and Zimbabwe, to test whether the associations differ across markets.

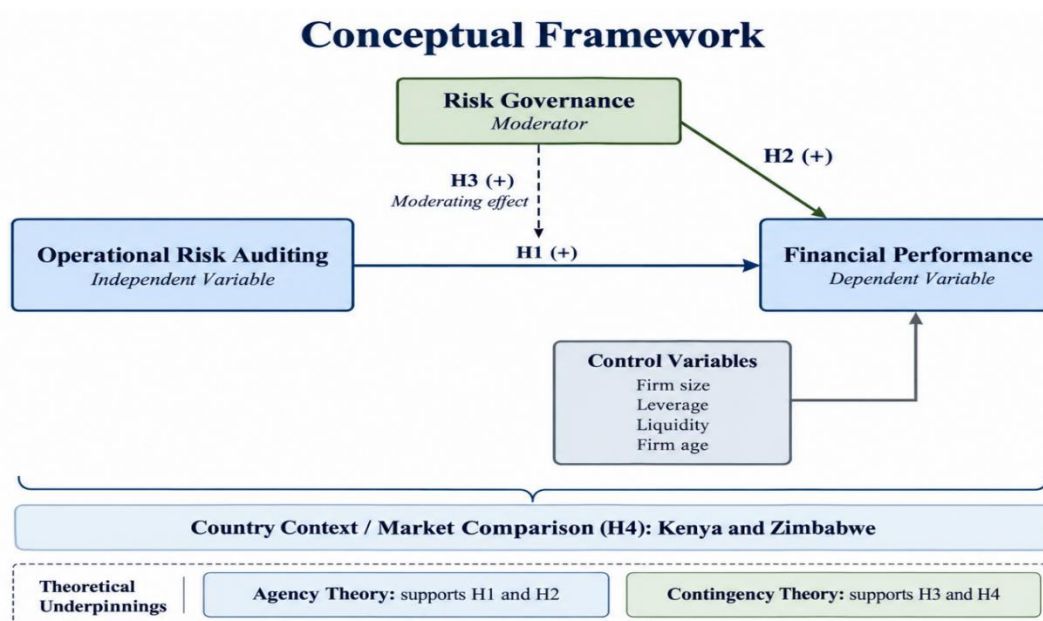


Figure 1: Conceptual framework. Source: Author's conceptualisation (2026).

4. Methodology

4.1 Research Design

The study adopts a quantitative, explanatory research design under a positivist philosophy. Explanatory here means that the study tests theoretically derived associations, not that it establishes causal effects. It uses an unbalanced panel of general insurance companies in Kenya and Zimbabwe, observed annually over 2015 to 2024. A panel design is suited to the research questions because it follows the same insurers over time, absorbs time invariant insurer characteristics through insurer fixed effects, and allows the relationships to be compared across the two markets (Baltagi, 2021). The estimand in Models 1 and 2 is the within insurer conditional association between disclosure based scores for operational risk auditing and risk governance and financial performance. The indices measure what insurers disclose about their audit and governance arrangements. They do not measure verified audit quality or governance effectiveness, and the design does not identify causal effects. Findings are therefore reported as associations, and the mechanisms discussed in Section 3

are theoretical explanations that the data do not observe.

4.2 Population and Sample

The target population is all general (non life) insurers licensed by the Insurance Regulatory Authority (IRA) in Kenya and the Insurance and Pensions Commission (IPEC) in Zimbabwe at any time during 2015 to 2024. The population was identified from the regulators' registers of licensed insurers as at 31 December 2024, supplemented by the regulators' annual industry reports to capture insurers that exited, merged or changed licence status earlier in the period. This gave 56 insurers, 38 in Kenya and 18 in Zimbabwe. Composite insurers, which hold licences for both long term and general business, are included where general insurance business can be separately identified from the financial statements.

An insurer enters the estimation sample if it published annual reports for at least five consecutive years within 2015 to 2024. Forty nine insurers (34 Kenyan and 15 Zimbabwean) met this rule. The study is therefore a census of eligible reporting insurers, not an unrestricted census of all licensed insurers, and it may be affected by selection. The rule

can exclude newer insurers, distressed insurers and less transparent insurers, which may differ in profitability and disclosure from continuous reporters. If they do, the estimates describe insurers with sustained public reporting and may overstate average disclosure and profitability for the whole market. Seven insurers failed the rule, four in Kenya and three in Zimbabwe. Appendix C lists each by anonymised code with its licence date, the years of reports found and the reason for exclusion. In summary, two Kenyan insurers were licensed in 2021 and 2022 and could not reach five years of reports; one Kenyan insurer entered statutory management in 2018 after three published reports; one Kenyan insurer published accessible reports only in non consecutive years; one Zimbabwean insurer was licensed in 2021; and two Zimbabwean insurers published accessible reports for only three and four consecutive years.

The estimation sample contains 461 firm years (Kenya 320 and Zimbabwe 141) out of a possible 490 for 49 insurers over ten years. Of the 29 missing firm years, 21 arise because an insurer entered after 2015 or exited or merged before 2024, and 8 arise because a report for a year within the

insurer's active life could not be obtained. A missing report is treated as a missing firm year, never as a zero. A missing report is also distinguished from a missing variable: wherever a report was available, every model variable could be extracted, except for the cases of small or negative equity and non positive earned premium described in Section 4.7. Counts of insurers and firm years by country and year are reported in Table 5.1. The identifier, country, business type, first year, last year and number of firm years for each of the 49 included insurers are in Table C2 in Appendix C.

An insurer that entered after 2015 contributes observations from its first full year of reporting. An insurer that exited through liquidation or run off contributes until its last audited report. Four merger or acquisition events occurred among sample insurers, three in Kenya and one in Zimbabwe. The acquiring insurer keeps its identifier, the acquired insurer's series ends with its last stand alone report, and the merger year and the following year are flagged so that they can be excluded in a sensitivity check.

Two further checks assess sensitivity to the eligibility rule. The first restricts the

sample to the 31 insurers observed in all ten years (310 firm years), which removes the unbalanced entry and exit pattern. The second relaxes the rule to three consecutive years of reports, which adds six insurers and 21 firm years and gives 55 insurers and 482 firm years.

The unit of analysis is the licensed insurance entity. Of the 49 insurers, 12 are composite insurers (nine in Kenya and three in Zimbabwe). For these, net profit after tax and total assets are both taken from the general insurance segment disclosure or from the statutory accounts of the general business, so that the numerator and denominator of ROA refer to the same business. Where tax is not allocated to the segment, it is estimated by applying the statutory income tax rate to segment profit before tax. Assets shared with other business lines enter only to the extent that the segment note allocates them to general insurance. Financial figures are taken from the standalone financial statements of the licensed insurer. Consolidated group statements are used only where no standalone statements are published, and those firm years are flagged. Governance disclosures are coded only where the report states that they apply

to the licensed insurer or to its general insurance business. Group wide statements that do not say they apply to the insurer are coded as not disclosed. A sensitivity check excludes the 12 composite insurers and the flagged firm years.

4.3 Data Sources and Collection

The study uses secondary data. Financial and governance data are extracted from the audited annual reports and financial statements of each insurer, which are the primary source. Regulator publications play three supporting roles. The IRA annual insurance industry reports and the IPEC quarterly and annual reports supplied the population registers and the licensing and exit dates, and they supplied market totals used to validate extracted total assets and gross premiums. Where an extracted figure differs from the regulator's figure for the same insurer and year by more than 5 percent, the discrepancy is traced to its cause, for example regulatory admitted assets compared with accounting assets, restatement, or unit scaling. The audited company statement takes precedence for model variables because it is the primary source and is prepared on the same accounting basis

as the insurer's other variables. The regulator figure is used only to correct demonstrable extraction errors.

A firm year source ledger records, for every firm year, the report title, publication date, URL or archive identifier, the page of each extracted figure and disclosure item, the coder and the date of extraction. Appendix D shows its structure, and the full ledger is part of the replication package described in Section 4.8. Figures are taken from the report for the year itself as originally published. Restated comparatives from later reports are used only in the sensitivity checks described in Section 4.4.2.

Data are recorded in a structured template. Accuracy was checked by a second researcher who independently re extracted the seven financial inputs (net profit after tax, total assets, total liabilities, current assets, current liabilities, total equity and year of incorporation) for a stratified random sample of 70 firm years, which is 15.2 percent of 461. The sample comprised 49 Kenyan and 21 Zimbabwean firm years spread across all ten years. Of the 490 data points checked, six (1.2 percent) differed from the source, all because of transcription or unit scaling

errors. They were corrected, the full dataset was screened for the same type of error using range and unit checks, and a second random draw of 35 firm years found no further discrepancies.

4.4 Measurement of Variables

4.4.1 Disclosure indices

Operational risk auditing (ORA) and risk governance (RG) are measured as disclosure based indices constructed by content analysis of annual reports. They record whether an insurer discloses specified audit and governance arrangements. They do not verify that those arrangements operate effectively, so a higher score indicates more extensive disclosure and not verified audit quality or governance effectiveness.

The ORA index has 18 items in six dimensions and the RG index has 20 items in six dimensions. Table 4.1 summarises the dimensions, and Appendix A lists every item with its coding rule and theoretical rationale. The coding unit is one item in one firm year report. An item is coded 1 if the report contains a specific statement that the arrangement exists or operated during the year, and 0 otherwise. Four rules govern the difficult cases. First, an

unavailable report gives a missing firm year (Section 4.2) and is never coded as zeros. Second, an available report that is silent on an item scores 0. Third, an ambiguous or generic statement, such as a general reference to strong controls, scores 0 unless it names the function or arrangement, says what it covers and says to whom it reports. Fourth, an item is not applicable only where the arrangement cannot exist for legal or structural reasons, for example audit coverage of reinsurance for an insurer that ceded no business in the year. Not applicable items are removed from both the numerator and the denominator.

Each index is the share of applicable items disclosed, with equal weight on every item:

$ORA_{it} = \sum_k x_{ikt} / \sum_k a_{ikt}$, and RG_{it} is defined in the same way,

where x_{ikt} equals 1 if item k is disclosed by insurer i in year t and 0 otherwise, and a_{ikt} equals 1 if item k is applicable and 0 otherwise. Both indices therefore lie between 0 and 1 and are not restricted to multiples of one sixth. An alternative weighting gives each of the six dimensions equal weight, so that the index equals one sixth of the sum over

dimensions of the share of applicable items disclosed within that dimension.

Underwriting, claims, reinsurance and information systems coverage are scored as four separate items (A9 to A12), so an insurer that discloses audit coverage of three of the four areas scores three of the four items in that dimension. Meeting frequency is coded by two items for each committee: whether the number of meetings held in the year is disclosed, and whether at least four meetings were held. The threshold of four reflects a quarterly meeting cycle, a common benchmark in corporate governance guidance.

Two dimensions of ORA lie close to governance, and the construct boundary is therefore stated explicitly. Audit committee meeting frequency (dimension 5) is an oversight attribute of the board, and disclosed audit follow up (dimension 6) lies close to the corrective action mechanism attributed to risk governance. Both are retained in ORA because the audit committee is the body that receives internal audit reports, and follow up items record whether internal audit tracks its own recommendations, which belongs to the audit arrangement. The RG items refer to the board risk committee, the

chief risk officer and board risk expertise, which are separate from the audit function. Because retention is a judgement, two checks are reported (Table 4.4): re estimating the models with each dimension of each index left out in turn, and using a narrow ORA index that omits dimensions 5 and 6. The low correlation between ORA and RG reported in Section 5.3 shows limited statistical overlap. It does not establish that the constructs are conceptually distinct and is not used for that purpose.

Two independent coders applied the framework to every report, and agreement was assessed with Cohen's kappa (Cohen, 1960) on item level decisions before any reconciliation. The ORA index involved 8,298 decisions (18 items for each of 461 firm years) and the RG index 9,220 decisions (20 items), a total of 17,518. Raw agreement before reconciliation was 92.5 percent for ORA (7,679 decisions)

and 89.7 percent for RG (8,268 decisions), which correspond to kappa values of 0.84 and 0.79. At dimension level, kappa ranged from 0.76 to 0.91 for ORA and from 0.72 to 0.88 for RG. The lowest values were for audit follow up and board risk expertise, where wording varies most between reports. Disagreements were discussed by the two coders and, where they could not agree, referred to the lead researcher, whose decision was final. Item-level kappa, raw agreement and the percentage of firm years in which each item was disclosed are reported for all 38 items in Table B1, by country and for 2015, 2018, 2021 and 2024. Dimension-level kappa values are in Table B2. High agreement shows that the coding can be reproduced. It does not show that the items validly measure audit quality or governance effectiveness, which is why the indices are called disclosure indices throughout.

Table 4.1 Measurement of Variables

<i>Variable</i>	<i>Role</i>	<i>Measurement and notes</i>
<i>Financial performance (ROA)</i>	Dependent	Net profit after tax divided by total assets, percentage points Same statement, same business, same currency basis rule; Table 4.2

Variable	Role	Measurement and notes
<i>Return on equity (ROE)</i>	Alternative dependent	Net profit after tax divided by total equity, percentage points Defined only where equity is positive and at least 5 percent of assets
<i>Combined ratio</i>	Alternative dependent	Claims plus expenses divided by earned premium, or the IFRS 17 mapping Lower values indicate better underwriting performance
<i>Operational risk auditing (ORA)</i>	Independent	Share of 18 applicable items disclosed, 0 to 1. Six dimensions: internal audit function (3 items), reporting line to the audit committee (2), risk based audit plan (3), coverage of operational risks in audit scope with underwriting, claims, reinsurance and information systems scored separately (4), audit committee meeting frequency (2), reporting of audit findings and follow up action (4) Disclosure index, not verified audit quality; Appendix A
<i>Risk governance (RG)</i>	Moderator	Share of 20 applicable items disclosed, 0 to 1. Six dimensions: board risk committee (4 items), separate chief risk officer or equivalent (3), CRO reporting line to the board (3), risk committee independence (4), risk committee meeting frequency (3), board level risk expertise (3) Disclosure index, not verified governance effectiveness; Appendix A
<i>Firm size (SIZE)</i>	Control	Natural logarithm of total assets in constant 2015 US dollars Unit free alternative: log of share of country general insurer assets
<i>Leverage (LEV)</i>	Control	Total liabilities divided by total assets Same statement as ROA
<i>Liquidity (LIQ)</i>	Control	Current assets divided by current liabilities Same statement as ROA
<i>Firm age (AGE)</i>	Control	Natural logarithm of years since incorporation Retained, with a with and without sensitivity

Source: Authors' conceptualisation (2026)

4.4.2 Financial variables, accounting comparability and units

Return on assets (ROA) is the primary measure of financial performance. It is net profit after tax divided by total assets, expressed in percentage points, and it is widely used in studies of insurer profitability (Shiu, 2004; Mwangi and Murigu, 2015). ROA removes the monetary unit only when numerator and denominator undergo the same proportional conversion. It does not remove differences in inflation adjustment, functional currency, exchange rate treatment or accounting

standard. The study therefore applies a same statement, same business, same currency basis rule: numerator and denominator are taken from the same set of audited statements, for the same business (Section 4.2), in the same currency unit and on the same inflation accounting basis. Table 4.2 summarises the general pattern in each country. The functional currency, presentation currency, monetary unit, accounting basis and any restatement for each firm year are recorded from the accounting policy notes in the source ledger, because insurers differed in the timing of changes.

Table 4.2 Currency and accounting basis protocol

<i>Country and period</i>	<i>Functional currency</i>	<i>Presentation currency and unit</i>	<i>Accounting basis</i>	<i>Treatment in this study</i>
<i>Kenya, 2015 to 2022</i>	Kenya shilling	Kenya shillings, thousands or millions as presented	IFRS 4, historical cost, no hyperinflation adjustment	Figures as originally reported
<i>Kenya, 2023 to 2024</i>	Kenya shilling	Kenya shillings, as presented	IFRS 17 and IFRS 9, historical cost	As originally reported, IFRS 17 indicator equal to 1

Country and period	Functional currency	Presentation currency and unit	Accounting basis	Treatment in this study
<i>Zimbabwe, 2015 to 2018</i>	US dollar	US dollars, as presented	IFRS 4, historical cost	As originally reported
<i>Zimbabwe, 2019</i>	US dollar then Zimbabwe dollar during the year	Zimbabwe dollars, as presented	IFRS with IAS 29	Transition year, flagged, inflation adjusted statements used
<i>Zimbabwe, 2020 to 2022</i>	Zimbabwe dollar	Zimbabwe dollars, as presented	IFRS 4 with IAS 29	Inflation adjusted statements used, net monetary gain or loss identified
<i>Zimbabwe, 2023</i>	Zimbabwe dollar	Zimbabwe dollars, as presented	IFRS 17 with IAS 29	As above, IFRS 17 indicator equal to 1
<i>Zimbabwe, 2024</i>	Zimbabwe dollar until April 2024, then Zimbabwe Gold	As presented	IFRS 17 with IAS 29	Transition year, flagged, as above

Source: Authors' conceptualisation (2026)

For firm years prepared under IAS 29, statements are expressed in current end of period units with restated comparatives, and a net monetary position gain or loss is shown

separately in profit or loss. ROA for these firm years uses the inflation adjusted profit, which includes that gain or loss, and inflation adjusted total assets. Because the net monetary gain

or loss is not an underwriting or operating outcome, a second measure, ROA excluding the net monetary position gain or loss, is computed by removing it from the numerator. Where insurers also published historical cost statements as supplementary information, those figures are used in a further sensitivity check.

The sample spans the IFRS 17 transition. IFRS 17 applies to annual periods beginning on or after 1 January 2023, and IPEC requires it of Zimbabwean insurers from the same date. The adoption date, any restated comparatives and the transition basis are recorded for each insurer. Each firm year carries an IFRS 17 indicator. Results for 2022 and earlier are as reported under the previous standard, and results for 2023 and 2024 are as reported under IFRS 17. Restated comparatives are used only in sensitivity checks. Regulatory changes after 2024, including Statutory Instrument 44 of 2026, fall outside the observation period and play no part in measurement.

Return on equity (ROE) is net profit after tax divided by total equity, in percentage points. It is defined only where total equity is positive and at

least 5 percent of total assets, so that small or negative equity does not produce meaningless ratios, and other firm years are set to missing for ROE. The combined ratio is defined only where net earned premium is positive. Before IFRS 17 it is net claims incurred plus commissions plus management expenses, divided by net earned premium. Under IFRS 17 it is mapped to insurance service expenses plus net expenses from reinsurance contracts held, divided by insurance revenue. The two definitions differ in scope, so the combined ratio results are read with the IFRS 17 indicator in view, and a sensitivity check excludes the transition years 2022 and 2023.

SIZE is the natural logarithm of total assets on a common real basis: total assets are converted to US dollars at the year end rate published by the central bank of each country and deflated to constant 2015 prices using the United States consumer price index. For Zimbabwean firm years under IAS 29, inflation adjusted assets are converted at the year end rate. Because official Zimbabwean rates diverged from parallel market rates in some years, a unit free alternative is also computed, the natural logarithm of the insurer's share of total general

insurer assets in its country and year, taken from regulator reports. Insurer fixed effects absorb a constant unit difference, but they do not absorb changing currency or inflation distortions, which is why the two measures are compared in Table 4.4. Cross country differences in mean SIZE are interpreted only on the common real basis.

Leverage (LEV) is total liabilities divided by total assets, and liquidity (LIQ) is current assets divided by current liabilities. Firm age (AGE) is the natural logarithm of years since incorporation. Unlike age in years, which rises by one each year for every insurer and is absorbed by insurer and year effects, log age varies nonlinearly and keeps some within insurer variation, although its identification is weak and its fixed effects standard error is large. A with and without log age sensitivity is reported (Table 4.4).

The four controls follow the insurer profitability literature: SIZE for scale and diversification, LEV for financing cost and solvency pressure, LIQ for the capacity to meet claims, and AGE for experience and reputation (Shiu, 2004). Other time varying insurer characteristics may also relate to both

disclosure and profitability, namely underwriting experience, reinsurance arrangements, capital position and business mix. They are left out of the main models because several are potential mediators: if audit improves underwriting, a control for current underwriting would absorb part of the association of interest. Equity divided by total assets is not used as a capital measure because it equals one minus leverage. Theoretically justified sensitivity checks add the reinsurance cession ratio (premiums ceded divided by gross written premiums), the regulatory solvency margin ratio, the motor share of gross written premiums as a business mix measure, and the previous year's net loss ratio as predetermined underwriting experience. Current year claims and expense ratios are not added because they are components of the outcome.

Units are as follows. ROA, ROE and the combined ratio are in percentage points, and ORA and RG are on a 0 to 1 scale. A coefficient on an index gives the change in percentage points of ROA for a change of 1.00 in the index, so a change of 0.10 in an index, which is ten percentage points more of the items disclosed, changes ROA by one tenth of the coefficient. This is not a ten

percent relative increase in the index, which depends on the starting value, and it is not a percentage change in ROA.

4.5 Model Specification

The relationships among operational risk auditing, risk governance and financial performance are estimated with panel regressions of ROA on the disclosure indices and controls. Models 1 to 3 include insurer fixed effects μ_i and year effects λ_t unless stated otherwise. Model 1 uses the indices in their original 0 to 1 form. In Models 2 and 3 the indices are mean centred before the interaction is formed: $ORA_{it}^c = ORA_{it}$ minus 0.631 and $RG_{it}^c = RG_{it}$ minus 0.565, where 0.631 and 0.565 are the means in the pooled estimation sample of 461 firm years (Table 5.2). The same pooled means are used in the country models, so that coefficients refer to the same reference point in Kenya and Zimbabwe. For each robustness sample the indices are recentred at the mean of that sample, and the means are given in the table notes. Centring eases the interpretation of the main effects. It does not change the interaction estimate or its significance (Aiken and West, 1991).

Model 1: Direct associations (H1 and H2)

$$ROA_{it} = \beta_0 + \beta_1 ORA_{it} + \beta_2 RG_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 LIQ_{it} + \beta_6 AGE_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Model 2: Moderation (H3)

$$ROA_{it} = \alpha_0 + \alpha_1 ORA_{it}^c + \alpha_2 RG_{it}^c + \alpha_3 (ORA_{it}^c \times RG_{it}^c) + \alpha_4 SIZE_{it} + \alpha_5 LEV_{it} + \alpha_6 LIQ_{it} + \alpha_7 AGE_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

Model 3: Country comparison (H4)

$$ROA_{it} = \gamma_0 + \gamma_1 ORA_{it}^c + \gamma_2 RG_{it}^c + \gamma_3 (ORA_{it}^c \times RG_{it}^c) + \delta_1 (ZIM_i \times ORA_{it}^c) + \delta_2 (ZIM_i \times RG_{it}^c) + \delta_3 (ZIM_i \times ORA_{it}^c \times RG_{it}^c) + \gamma_4 SIZE_{it} + \gamma_5 LEV_{it} + \gamma_6 LIQ_{it} + \gamma_7 AGE_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3)$$

Model 3b: Country by year effects (sensitivity for H4)

Equation (3) with λ_t replaced by $\theta(c,t)$, a separate effect for each country and year, where c is the country of insurer i . (4)

In these equations, i denotes the insurer and t the year. ROA is return on assets, ORA and RG are the operational risk auditing and risk governance indices, SIZE is the natural logarithm of total assets on the common real basis, LEV is leverage, LIQ is

liquidity and AGE is the natural logarithm of firm age. ZIM equals 1 for Zimbabwean insurers and 0 for Kenyan insurers. μ_i is the insurer fixed effect, λ_t the year effect and ε_{it} the idiosyncratic error. A standalone ZIM term is omitted from equation (3) because ZIM is constant within each insurer and is absorbed by μ_i . The interactions of ZIM with the time varying ORA^c , RG^c and their product are not absorbed, and they are estimated together with insurer effects. Kenya is the reference group, so γ_1 , γ_2 and γ_3 are the Kenyan coefficients and the Zimbabwean coefficients are γ plus δ . Dropping insurer effects from Model 3 would allow persistent differences in insurer composition to contribute to estimates that are then compared with the preferred within insurer results, so insurer effects are retained in the primary H4 specification. Common year effects cannot remove annual shocks that are specific to one country, such as exchange rate changes and regulatory developments. Model 3b therefore replaces them with country by year effects, which also absorb country wide changes in disclosure requirements.

Table 4.3 Decision rules

Models 1 and 2 are also estimated separately for the Kenyan and Zimbabwean subsamples, with insurer and year effects and the pooled centring means. Pooled OLS without insurer effects is reported for Model 1 only as a comparison with the fixed effects estimates. Every results table states whether insurer effects are included and which centring is used.

Disclosure scores may also change because reporting requirements or templates change, not because audit or governance practice changes. Kenya's 2022 Insurance (Risk Management and Control Functions) Guidelines (Gazette Notice 3643 of 2022, effective 29 March 2022) fall within the sample and require specified functions, so they may raise disclosure scores independently of practice. Their timing is documented in Section 3.4, country by year effects in Model 3b absorb their country wide effect, and Table 4.4 adds two further checks: a control for the log number of pages in the governance and risk reporting sections of each report, and a Kenya subsample ending in 2021.

Hypothesis	Parameter tested	Decision rule
<i>H1: Operational risk auditing is positively associated with financial performance</i>	β_1 in Model 1 and α_1 in Model 2	Supported if the coefficient is positive and significant at the 5 percent level under insurer clustered inference and the 5 percent result also holds under the wild cluster bootstrap. A result that holds under one only is reported as weakened
<i>H2: Risk governance is positively associated with financial performance</i>	β_2 in Model 1 and α_2 in Model 2	Same rule as H1. A coefficient significant only at the 10 percent level is reported as weak evidence and H2 is not treated as supported at the 5 percent rule
<i>H3: The association of auditing with performance increases with risk governance</i>	α_3 in Model 2	Supported if α_3 is positive and significant at the 5 percent level, and the conditional association at the 90th percentile of RG exceeds that at the 10th percentile with confidence intervals reported
<i>H4: The associations differ between Kenya and Zimbabwe</i>	δ_1 , δ_2 and δ_3 in Model 3 with insurer effects	A joint Wald test rejecting $\delta_1 = \delta_2 = \delta_3 = 0$ shows only that at least one difference exists. Each δ is tested separately. A statement that an association is stronger in one country requires a Zimbabwe minus Kenya gap with a confidence interval that excludes zero at the governance values discussed. Otherwise the difference is reported as conditional on governance. The

Hypothesis	Parameter tested	Decision rule
		conclusion must also hold in Model 3b

Source: Authors' conceptualisation (2026)

Where the interaction is significant, the conditional association of ORA with ROA in Model 2 is

$$\partial \text{ROA} / \partial \text{ORA} = \alpha_1 + \alpha_3 \text{RG}^c, \text{ where } \text{RG}^c = \text{RG} \text{ minus } 0.565,$$

which equals $\alpha_1 + \alpha_3(\text{RG} \text{ minus } 0.565)$ for any raw value of RG. Its variance is $\text{Var}(\hat{\alpha}_1) + \text{RG}^{c2} \text{Var}(\hat{\alpha}_3) + 2 \text{RG}^c \text{Cov}(\hat{\alpha}_1, \hat{\alpha}_3)$, taken from the insurer clustered covariance matrix, and its 95 percent confidence interval follows the small cluster procedures in Section 4.6. The association is evaluated at raw RG values within the observed support: the 10th, 25th, 50th, 75th and 90th percentiles of RG in the estimation sample, and the mean minus one standard deviation (0.38), the mean (0.565) and the mean plus one standard deviation (0.75). Table 5.7 reports the estimates, standard errors and confidence intervals. Figure 5.1 retains the simple slopes illustration at low, average and high governance; the percentile estimates and 95 percent confidence intervals are reported in Table 5.7. Predictions from the fixed

effects model hold controls at their sample means, year effects at their sample average and insurer effects at their sample average, so the figure shows slopes and not the profitability of a particular insurer.

The country comparison uses the same logic. In Model 3 the Zimbabwe minus Kenya difference in the ORA association is $\delta_1 + \delta_3 \text{RG}^c$, and the difference in the RG association is $\delta_2 + \delta_3 \text{ORA}^c$. The Zimbabwean ORA association is $(\gamma_1 + \delta_1) + (\gamma_3 + \delta_3) \text{RG}^c$. Each is reported with a covariance based confidence interval at the common governance values listed above, using both the corrected Model 3 and Model 3b. A joint Wald test of $\delta_1 = \delta_2 = \delta_3 = 0$ shows that at least one difference is nonzero, and it does not show that each difference is nonzero. Each δ is therefore tested individually. Significant country specific coefficients are not themselves tests of between country differences.

The conditional estimates are interpreted as follows. A slope that is

not significant at low governance means that a nonzero conditional association was not detected at that index value. It does not show that auditing cannot help without particular board structures. The composite indices do not identify a necessary chief risk officer or committee arrangement, and they do not observe the proposed remediation mechanism.

4.6 Estimation Strategy and Diagnostic Tests

The choice between pooled OLS, fixed effects and random effects is guided by the Breusch and Pagan (1979) Lagrange multiplier test and the Hausman (1978) test. The classical Hausman test assumes homoskedastic and serially uncorrelated errors, which the diagnostics in Section 5.4 reject. The comparison is therefore repeated with a cluster robust Mundlak test, which adds the insurer means of the time varying regressors to a random effects model and tests them jointly with insurer clustered standard errors (Mundlak, 1978; Wooldridge, 2010), and with the cluster robust overidentification test of Schaffer and Stillman (2010). Groupwise heteroskedasticity is examined with the modified Wald test, and first order serial

correlation with the Wooldridge test for panel data (Drukker, 2003). The modified Wald test has weak size properties when the number of periods is small (Baum, 2001), so it is read as an indication only, and inference does not depend on it because clustered standard errors are used in every case. Multicollinearity is assessed with variance inflation factors. No diagnostic result is treated as proof that every source of bias has been removed: fixed effects remove time invariant insurer differences but not omitted time varying factors or reverse causality. Estimation uses Stata 18 (xtreg, reghdfe and boottest) and R 4.4 (fixest and clubSandwich).

Before estimation, the continuous financial variables (ROA, ROE, the combined ratio, SIZE, LEV, LIQ and AGE) are winsorised at the 1st and 99th percentiles of the pooled estimation sample. The disclosure indices are bounded between 0 and 1, are not winsorised, and their construction is not altered by winsorisation. Winsorisation within each country and no winsorisation are reported as sensitivity checks (Table 4.4) to separate genuinely influential observations from the effect of preprocessing.

Primary inference uses standard errors clustered by insurer (Petersen, 2009), because of the heteroskedasticity and serial correlation reported in Section 5.4. The number of clusters is 49 in the pooled sample, 34 in Kenya and 15 in Zimbabwe. With 15 clusters, conventional cluster robust inference can reject too often, so small cluster inference is part of the main analysis. Conventional p values use the t distribution with G minus 1 degrees of freedom, where G is the number of insurers. Two corrections are reported for every country interaction and for the Zimbabwe conditional associations. The first is the wild cluster bootstrap t procedure with 9,999 replications and the null imposed (Cameron, Gelbach and Miller, 2008; Roodman, Nielsen, MacKinnon and Webb, 2019), using Rademacher weights, with Webb (2014) six point weights as a check for the Zimbabwe subsample, and confidence intervals obtained by inverting the test. The second is CR2 bias reduced linearisation standard errors with Satterthwaite degrees of freedom (Pustejovsky and Tipton, 2018). Tables 5.5b, 5.6, 5.7, 5.8b, 5.9 and 5.10 report 95 percent confidence intervals, and Tables 5.5 and 5.8 report standard errors, with confidence intervals for their key coefficients given

in Tables 5.5b and 5.8b. All regression tables report the cluster count, and the degrees of freedom used are stated in the table notes.

Driscoll and Kraay (1998) standard errors are not used for primary inference. Their large sample justification requires a long time dimension, and this panel has at most ten annual periods. They are reported only as a descriptive check with a Bartlett kernel bandwidth of two lags, and their finite sample limits are acknowledged.

The comparison of mean ROA between countries in Section 5.2 involves repeated firm years within insurers, so an independent observations Welch test is not used for the significance claim. The difference is instead tested with a regression of ROA on the country indicator and year effects with insurer clustered errors, using the wild cluster bootstrap for the 15 Zimbabwean clusters, and with a Welch comparison of the 49 insurer level mean ROA values. The firm year means are reported descriptively.

Fixed effects identification depends on changes in scores within insurers, not on the pooled spread alone. Section 5.2 therefore reports the within and

between standard deviations of ORA and RG, and the number and share of insurers whose scores change by at least 0.10 over their observed years, overall and by country.

All regression tables report the number of observations, the number of insurers as clusters, the R squared with its definition (within R squared for fixed effects models and overall R squared for pooled OLS), and whether insurer effects and year effects are included. Each table is kept on one page with its title and first rows together, and header rows are repeated if a table has to split.

4.7 Robustness and Sensitivity Checks

The checks in Table 4.4 address the threats raised by data construction, accounting comparability, index measurement, omitted factors and inference. For every check, Tables 5.9 to 5.13 report exact coefficients, standard errors, p values, 95 percent confidence intervals, observations, insurers and fit statistics, and not signs and stars alone. Each check is judged against the decision rules in Table 4.3. A result that loses significance at the 5 percent level in a check is reported as weakened and not as unchanged, and

the text distinguishes stable signs from stable significance.

The lagged specification uses ORA and RG at $t - 1$ in place of the contemporaneous values. The lagged interaction is the product of the two lagged indices, each centred at the mean of the lagged estimation sample. A lag is formed only where the insurer has a report for year $t - 1$. Values are never carried forward or interpolated, so a gap in reports removes the following year's observation. The lagged sample covers 2016 to 2024 and contains 404 firm years. One year lags improve temporal ordering. They do not remove reverse causality or omitted time varying factors, and they are not presented as resolving causal identification.

Excluding 2019 and 2024 from the Zimbabwe sample is a useful sensitivity check but not a substitute for the accounting basis protocol in Section 4.4.2, because inflation effects can persist in the remaining years. Targeted checks therefore use ROA excluding the net monetary position gain or loss, estimate the Zimbabwe models separately for 2015 to 2018 and 2019 to 2024 where observations allow, use historical cost figures where published,

add the IFRS 17 indicator, and exclude the transition years 2022 and 2023.

Table 4.4 Robustness and sensitivity checks

<i>Check</i>	<i>Specification</i>	<i>Threat addressed</i>
<i>ROE as outcome</i>	ROE as defined in Section 4.4.2, with firm years of small or negative equity set to missing	Outcome choice
<i>Combined ratio as outcome</i>	IFRS 17 mapping applied from 2023; lower values are better, so signs should reverse	Outcome choice, accounting standard
<i>ROA excluding net monetary gain or loss</i>	Numerator net of the IAS 29 net monetary position gain or loss	Inflation accounting in Zimbabwe
<i>Equal dimension weights</i>	Each of the six dimensions given equal weight	Item weighting
<i>Leave one dimension out</i>	Each index re estimated with one dimension dropped in turn, 12 versions	Construct boundary
<i>Narrow ORA</i>	ORA without dimensions 5 and 6	Overlap of ORA with governance
<i>Balanced panel and relaxed eligibility</i>	31 insurers observed in all ten years; 55 insurers with three consecutive years	Sample selection
<i>Composites, group level, mergers</i>	Exclude 12 composite insurers and flagged group level firm years; exclude merger years	Unit of analysis

<i>Check</i>	<i>Specification</i>	<i>Threat addressed</i>
<i>Zimbabwe years and accounting basis</i>	Exclude 2019 and 2024; split 2015 to 2018 and 2019 to 2024; historical cost figures; IFRS 17 indicator; exclude 2022 and 2023	Currency, inflation, IFRS 17 transition
<i>SIZE and AGE</i>	SIZE as share of country assets; with and without log age	Unit basis, weak identification
<i>Winsorisation</i>	No winsorisation; country specific winsorisation	Preprocessing effects
<i>Added controls</i>	Reinsurance cession ratio, solvency margin ratio, motor share, previous year net loss ratio, one at a time and together	Omitted time varying factors
<i>Disclosure regime</i>	Control for log pages of governance and risk sections; Kenya sample ending in 2021	Changing disclosure requirements
<i>Country by year effects</i>	Model 3b	Country specific annual shocks
<i>One year lags</i>	ORA and RG at t minus 1, as described above	Temporal ordering only

Check	Specification	Threat addressed
<i>Small cluster inference</i>	Wild cluster bootstrap and CR2 with Satterthwaite degrees of freedom; Driscoll and Kraay with two lags as descriptive check	15 Zimbabwean clusters, short panel

Source: Authors' conceptualisation (2026)

4.8 Ethical Considerations and Replication

The study relies exclusively on published information about organisations, and no personal or confidential data are collected from human participants. Under the Africa Research University research ethics policy, secondary analysis of publicly available organisational documents does not require full ethical review, and this was confirmed with the university's ethics office before data collection. All sources are acknowledged. A replication package containing the full codebook (Appendix A), the item level codes for every firm year, the source ledger, the cleaned dataset, the analysis scripts with software and package versions (Stata 18 and R 4.4), and instructions to reproduce every table and figure will be deposited at Zenodo on acceptance, with the DOI

reported in the published article. During review it is available to the reviewers through the journal.

5. Results

This section reports the results in the order set by the research objectives: sample and coding reliability, descriptive statistics, correlations, diagnostic tests, the direct associations of operational risk auditing and risk governance with performance (H1 and H2), the moderating role of risk governance (H3), the comparison between Kenya and Zimbabwe (H4), and the robustness checks. Return on assets is measured in percentage points, and the two disclosure indices range from 0 to 1. All findings are conditional associations from observational disclosure data. Inference uses insurer clustered standard errors and, because the

Zimbabwean subsample has only 15 clusters, the wild cluster bootstrap and CR2 corrections described in Section 4.6. Every table reports the number of insurers as clusters.

5.1 Sample and coding reliability

The census of licensed general insurers covered 38 insurers in Kenya and 18 in Zimbabwe. Of these, 34 Kenyan and 15 Zimbabwean insurers had published annual reports for at least five consecutive years, giving 49 insurers and 461 firm years over 2015 to 2024 (Table 5.1). The study is therefore a census of eligible reporting insurers, and the results describe insurers with sustained public reporting (Section 4.2). The panel is unbalanced. The maximum possible is 490 firm years and 29 are missing. Twenty one arise because an insurer entered after 2015 or exited or merged before 2024, and eight (five Kenyan and three Zimbabwean) arise because a report

within the insurer's active life could not be obtained. Once a report was obtained, no model variable was missing, apart from the small equity and earned premium exclusions reported in Section 5.8. Each insurer is observed for 9.4 years on average, and 31 insurers are observed in all ten years.

Inter coder agreement was assessed on item level decisions before reconciliation. Raw agreement was 92.5 percent for operational risk auditing (7,679 of 8,298 decisions) and 89.7 percent for risk governance (8,268 of 9,220 decisions), which correspond to Cohen's kappa of 0.84 and 0.79. Landis and Koch (1977) classify these as almost perfect and substantial agreement respectively. Dimension level kappa ranged from 0.76 to 0.91 for ORA and from 0.72 to 0.88 for RG (Appendix B). Reliability shows that the coding can be reproduced. It does not show that the indices measure audit quality or governance effectiveness.

Table 5.1: Sample composition

Panel A: Summary

<i>Item</i>	<i>Kenya</i>	<i>Zimbabwe</i>	<i>Pooled</i>
<i>Licensed general insurers in population</i>	38	18	56

Item	Kenya	Zimbabwe	Pooled
<i>Insurers meeting the five year criterion</i>	34	15	49
<i>Maximum possible firm years</i>	340	150	490
<i>Firm years in estimation sample</i>	320	141	461
<i>Missing firm years</i>	20	9	29
<i>of which entry, exit or merger</i>	15	6	21
<i>of which missing report</i>	5	3	8
<i>Insurers observed in all ten years</i>	22	9	31
<i>Average years per insurer</i>	9.4	9.4	9.4

Panel B: Firm years by year

Year	Kenya	Zimbabwe	Pooled
<i>2015</i>	30	13	43
<i>2016</i>	31	13	44
<i>2017</i>	31	14	45
<i>2018</i>	32	14	46
<i>2019</i>	32	14	46
<i>2020</i>	33	15	48
<i>2021</i>	33	15	48
<i>2022</i>	33	15	48
<i>2023</i>	33	14	47
<i>2024</i>	32	14	46
<i>Total</i>	320	141	461

Source: Authors' conceptualisation (2026)

5.2 Descriptive statistics

Table 5.2 summarises the variables after winsorising the continuous financial variables at the 1st and 99th percentiles of the pooled sample. The disclosure indices are not winsorised. Return on assets averaged 4.78 percent across the sample, but the average differed between markets: 5.61 percent in Kenya and 2.91 percent in Zimbabwe, a difference of 2.70 percentage points in firm year means. Because firm years are repeated within insurers, the significance of this difference is not judged by an independent observations test. A regression of ROA on the country indicator and year effects with insurer clustered errors gives a difference of 2.64 percentage points (cluster robust $p = 0.007$, wild cluster bootstrap $p = 0.012$). A Welch comparison of the 49 insurer level mean ROA values (Kenya 5.58, Zimbabwe 2.95) gives a difference of 2.63 points ($t = 2.73$, about 21 degrees of freedom, $p = 0.013$). Profitability was also more dispersed in Zimbabwe (standard deviation 4.63)

than in Kenya (3.38). This is consistent with the monetary instability described in Section 3.4, but it may also reflect inflation accounting, since ROA for Zimbabwean firm years under IAS 29 includes the net monetary position gain or loss. Excluding that item lowers the Zimbabwean mean ROA to 2.58.

Kenyan insurers disclosed more on both operational risk auditing (index 0.684 against 0.510) and risk governance (0.598 against 0.489). Insurers disclosed on average 63.1 percent of the auditing items and 56.5 percent of the governance items. SIZE is measured as the natural logarithm of total assets in millions of constant 2015 US dollars, so that the two countries share a common real basis (Section 4.4.2). On this basis Kenyan insurers were larger, with a mean of 3.42 against 2.31, a gap of 1.11 log points, or about three times the assets. Kenyan insurers were also more highly leveraged (0.579 against 0.512), and Zimbabwean insurers held more liquid assets relative to current liabilities (1.74 against 1.45).

Table 5.2: Descriptive statistics, mean (standard deviation)

Variable	Kenya	Zimbabwe	Pooled	Pooled min	Pooled max
ROA (%)	5.61 (3.38)	2.91 (4.63)	4.78 (4.00)	-5.60	13.51
ORA	0.684 (0.134)	0.510 (0.122)	0.631 (0.153)	0.262	1.000
RG	0.598 (0.165)	0.489 (0.204)	0.565 (0.185)	0.050	0.948
SIZE (log, constant 2015 USD millions)	3.42 (0.85)	2.31 (1.02)	3.08 (1.04)	0.12	5.31
LEV	0.579 (0.098)	0.512 (0.092)	0.558 (0.101)	0.346	0.811
LIQ	1.45 (0.38)	1.74 (0.40)	1.54 (0.41)	0.58	2.43
AGE (log)	3.57 (0.40)	3.34 (0.58)	3.50 (0.47)	2.18	4.18

N = 461 (Kenya 320, Zimbabwe 141), 49 insurers (Kenya 34, Zimbabwe 15).

Source: Authors' conceptualisation (2026)

Fixed effects estimates depend on changes within insurers, so Table 5.2b separates within and between variation. The within standard deviation is 0.062 for ORA and 0.081 for RG, about 40 and 44 percent of the overall standard deviations. Forty one of the 49 insurers changed their ORA score by at least 0.10 between their lowest and highest observed values, and 44 changed their RG score by that amount. The identifying variation is therefore moderate but real. It can come from genuine changes in arrangements, from changes in reporting requirements or templates, or from both, and the indices cannot tell these apart (Section 4.5). Log age has a within standard

deviation of only 0.09 against a between standard deviation of 0.46, which explains why its fixed effects standard error is large.

Table 5.2b Within and between variation

Variable	Overall SD	Betw een SD	Within SD	Insurer s with a change of at least 0.10, Kenya	Zimbabw e	Total
ORA	0.153	0.140	0.062	28 of 34	13 of 15	41 of 49
RG	0.185	0.166	0.081	30 of 34	14 of 15	44 of 49
SIZE	1.04	0.97	0.38	not applica ble	not applicable	not applicable
AGE (log)	0.47	0.46	0.09	not applica ble	not applicable	not applicable

Source: Authors' conceptualisation (2026)

5.3 Correlations and multicollinearity

Table 5.3 reports pairwise correlations. Return on assets is positively correlated with operational risk auditing (0.46) and risk governance (0.36). The two indices are only weakly correlated with each other (0.17), and 0.12 when the narrow ORA index of Section 4.7 is used. This indicates limited statistical overlap. It

does not establish that the two constructs are conceptually distinct, because some items lie close together in meaning, and Section 5.8 therefore reports leave one dimension out results. The correlations pool variation between and within insurers and do not describe within insurer relationships. All variance inflation factors are below 1.25, the highest being 1.23 for operational risk auditing, so

multicollinearity is not a concern. After mean centring, the variance inflation factor of the interaction term is 1.07.

Table 5.3: Correlation matrix and variance inflation factors

	<i>ROA</i>	<i>ORA</i>	<i>RG</i>	<i>SIZE</i>	<i>LEV</i>	<i>LIQ</i>	<i>AGE</i>	<i>VIF</i>
<i>ROA</i>	1							not applicable
<i>ORA</i>	0.46	1						1.23
<i>RG</i>	0.36	0.17	1					1.05
<i>SIZE</i>	0.32	0.30	0.16	1				1.21
<i>LEV</i>	-0.08	0.12	-0.01	0.21	1			1.07
<i>LIQ</i>	-0.08	-0.16	-0.06	-0.24	-0.05	1		1.07
<i>AGE</i>	0.23	0.29	0.11	0.08	0.06	-0.07	1	1.12

Source: Authors' conceptualisation (2026)

5.4 Diagnostic tests and estimator choice

Table 5.4 reports the diagnostic tests, which are read as indications and not as proof that every source of bias has been removed. The Breusch and Pagan Lagrange multiplier test rejects the pooled specification ($\chi^2 = 212.6$, $p < 0.001$), which indicates insurer specific effects. The classical Hausman test favours fixed effects over random effects ($\chi^2 = 18.4$, $p = 0.005$), but it

assumes homoskedastic and serially uncorrelated errors, which the next two tests reject. The cluster robust Mundlak test ($\chi^2 = 15.7$, $p = 0.015$) and the cluster robust overidentification test ($\chi^2 = 17.1$, $p = 0.009$) also favour fixed effects. The modified Wald test indicates groupwise heteroskedasticity ($\chi^2 = 1,186$, $p < 0.001$), although it has weak size when the number of periods is small, and the Wooldridge test indicates first order serial correlation (F

= 9.37, $p = 0.004$). Inference therefore relies on standard errors clustered by insurer (Petersen, 2009), with the small cluster corrections of Section 4.6, and the fixed effects model is treated as the

preferred specification. Fixed effects remove time invariant insurer differences. They do not remove omitted time varying factors or reverse causality.

Table 5.4: Diagnostic tests

Test	Null hypothesis	Statistic	p value	Reading
<i>Breusch and Pagan LM</i>	No panel effects	$\chi^2(1) = 212.6$	<0.001	Pooled OLS rejected
<i>Hausman, classical</i>	Random effects consistent	$\chi^2(6) = 18.4$	0.005	Fixed effects preferred, assumptions doubtful
<i>Mundlak, cluster robust</i>	Insurer means jointly zero	$\chi^2(6) = 15.7$	0.015	Fixed effects preferred
<i>Overidentification, cluster robust</i>	Random effects orthogonality	$\chi^2(6) = 17.1$	0.009	Fixed effects preferred
<i>Modified Wald</i>	Homoskedastic errors	$\chi^2(49) = 1,186$	<0.001	Heteroskedasticity present, weak size in short panels
<i>Wooldridge</i>	No first order autocorrelation	$F(1,48) = 9.37$	0.004	Serial correlation present
<i>Maximum VIF</i>	not applicable	1.23	not applicable	No multicollinearity concern

Source: Authors' conceptualisation (2026)

5.5 Direct associations of operational risk auditing and risk governance (H1 and H2)

Table 5.5 presents Model 1. In the preferred fixed effects specification the coefficient on operational risk auditing is 11.262 ($p < 0.001$). A 0.10 increase in the ORA index, which equals ten percentage points more of the audit items disclosed, is associated with a 1.13 percentage point higher return on assets, holding other factors constant. This is not a ten percent relative increase in the index. Ten percent of the mean index of 0.631 is 0.063, which is associated with 0.71 percentage points. The coefficient on risk governance is 3.967 ($p = 0.020$), so a 0.10 increase in the RG index is associated with a 0.40 percentage point higher ROA, and a ten percent relative increase from the mean of 0.565 with 0.22 points. Table 5.5b shows that both results hold under the wild cluster bootstrap and CR2 corrections, so H1 and H2 are supported in Model 1 under the decision rules in Table 4.3. These are within insurer associations. They do not show that auditing raises profitability or that boards acted on audit findings.

The pooled OLS estimates give the same signs and conclusions (ORA 9.424, $p < 0.001$; RG 5.608, $p = 0.002$), so the findings do not depend on insurer effects, although pooled OLS also mixes differences between insurers with changes within them. Leverage has a consistently negative association with profitability (-6.065 in the fixed effects model, $p < 0.001$), in line with the financing costs and solvency pressure of more leveraged insurers. Firm size is significant only in the pooled model (0.670 , $p < 0.01$) and not within insurers (-0.498 , standard error 1.292), which suggests that it captures differences between insurers. Firm age is significant in neither specification. In the pooled model its coefficient is 0.812 with a standard error of 0.541 , a ratio of about 1.50, and in the fixed effects model it is 0.715 with a standard error of 3.401 . The large fixed effects standard error reflects the small within insurer variation in log age (Table 5.2b), and dropping log age leaves the ORA and RG estimates almost unchanged (Table 5.9). Liquidity is not significant in either specification.

Table 5.5 Model 1: direct associations with ROA

<i>Variable</i>	<i>Pooled OLS</i>	<i>Fixed effects</i>
<i>ORA</i>	9.424*** (1.974)	11.262*** (2.684)
<i>RG</i>	5.608*** (1.705)	3.967** (1.648)
<i>SIZE</i>	0.670*** (0.217)	−0.498 (1.292)
<i>LEV</i>	−6.704*** (1.413)	−6.065*** (1.347)
<i>LIQ</i>	0.439 (0.329)	0.546 (0.336)
<i>AGE</i>	0.812 (0.541)	0.715 (3.401)
<i>Constant</i>	−8.601*** (2.322)	not applicable
<i>Year effects</i>	Yes	Yes
<i>Insurer effects</i>	No	Yes
<i>Observations</i>	461	461
<i>Insurers (clusters)</i>	49	49
<i>R squared</i>	0.368 (overall)	0.356 (within)

Standard errors clustered by insurer in parentheses. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: Authors' conceptualisation (2026)

Table 5.5b Small cluster inference for H1 to H3

<i>Coefficient</i>	<i>Estimate</i>	<i>Clusters</i>	<i>95% confidence interval</i>	<i>p value, conventional</i>	<i>p value, wild cluster bootstrap</i>	<i>p value, CR2 (degrees of freedom)</i>
<i>Model 1, ORA</i>	11.262	49	[5.87, 16.66]	<0.001	0.002	0.002 (36)

Coefficient	Estimate	Clusters	95% confidence interval	p value, conventional	p value, wild cluster bootstrap	p value, CR2 (degrees of freedom)
Model 1, RG	3.967	49	[0.65, 7.28]	0.020	0.031	0.027 (34)
Model 2, ORA	12.180	49	[8.46, 15.90]	<0.001	0.001	0.001 (38)
Model 2, RG	2.740	49	[0.43, 5.05]	0.021	0.033	0.029 (33)
Model 2, ORA × RG	63.073	49	[45.14, 81.01]	<0.001	0.001	0.001 (40)

Source: Authors' conceptualisation (2026)

Conventional intervals use the *t* distribution with 48 degrees of freedom. Wild cluster bootstrap *p* values use 9,999 replications with Rademacher weights and the null imposed. CR2 uses Satterthwaite degrees of freedom.

5.6 Moderating role of risk governance (H3)

Table 5.6 reports Model 2, in which the two indices are mean centred at the pooled means of 0.631 and 0.565. The interaction coefficient is positive and significant ($\alpha_3 = 63.073$, $p < 0.001$, 95% confidence interval 45.14 to 81.01), and it remains significant under the wild cluster bootstrap ($p = 0.001$) and CR2

($p = 0.001$), so H3 is supported: the association of operational risk auditing with ROA is larger where risk governance is higher. The model has a within R squared of 0.429. At the pooled mean of both indices, the coefficient on operational risk auditing is 12.180 ($p < 0.001$) and that on risk governance is 2.740 ($p = 0.021$, wild cluster bootstrap $p = 0.033$).

Table 5.6 Model 2: moderating role of risk governance

<i>Variable</i>	<i>Coefficient</i>	<i>Std. error; 95% confidence interval</i>	<i>p value</i>
<i>ORA centred</i>	12.180***	1.849; [8.46, 15.90]	<0.001
<i>RG centred</i>	2.740**	1.150; [0.43, 5.05]	0.021
<i>ORA centred × RG centred</i>	63.073***	8.920; [45.14, 81.01]	<0.001
<i>SIZE</i>	-1.100	1.231; [-3.58, 1.38]	0.376
<i>LEV</i>	-4.905***	1.218; [-7.35, -2.46]	0.001
<i>LIQ</i>	0.395	0.310; [-0.23, 1.02]	0.208
<i>AGE</i>	3.096	3.216; [-3.37, 9.56]	0.341
<i>Year and insurer effects</i>	Yes	;	
<i>Observations</i>	461	;	
<i>Insurers (clusters)</i>	49	;	
<i>R squared (within)</i>	0.429	;	

Source: Authors' conceptualisation (2026)

Standard errors clustered by insurer. Confidence intervals use the t distribution with 48 degrees of freedom.

Table 5.7 and Figure 5.1 show the conditional association of operational

risk auditing with ROA at raw values of risk governance within the observed

support. At one standard deviation below the mean (RG = 0.38) the estimate is 0.52 (95% confidence interval -4.27 to 5.31, $p = 0.830$), and at the 10th percentile (RG = 0.33) it is -2.64 (-8.03 to 2.75, $p = 0.329$). A nonzero association was not detected at these values. At the 25th percentile (RG = 0.44) the estimate is 4.30 ($p = 0.044$), at the mean it is 12.18, and at one standard deviation above the mean (RG = 0.75) it is 23.85, with the 90th percentile at 27.00 (all $p < 0.001$ above the 25th percentile). The association is distinguishable from zero at the 5 percent level for RG above about 0.44. In percentage point terms, a 0.10 increase in ORA is associated with 0.05 points higher ROA at RG of 0.38, 1.22

points at the mean and 2.39 points at RG of 0.75, and not 23.85 points.

The lack of a detected association at low governance does not show that auditing cannot help unless a particular board structure is present. It shows that a nonzero conditional association was not found at those index values. The composite indices do not identify a necessary chief risk officer or committee arrangement, and they do not observe how audit findings were used. The pattern is consistent with the complementarity argument in Section 3.5, but an interaction between two disclosure measures does not prove complementarity in implementation.

Table 5.7 Conditional association of ORA with ROA at raw values of RG

<i>RG level</i>	<i>RG value</i>	<i>Association of ORA with ROA</i>	<i>Std. error; 95% confidence interval</i>	<i>p value</i>
<i>10th percentile</i>	0.33	-2.64	2.68; [-8.03, 2.75]	0.329
<i>Mean minus 1 SD</i>	0.38	0.52	2.38; [-4.27, 5.31]	0.830
<i>25th percentile</i>	0.44	4.30	2.08; [0.11, 8.48]	0.044

<i>RG level</i>	<i>RG value</i>	<i>Association of ORA with ROA</i>	<i>Std. error; 95% confidence interval</i>	<i>p value</i>
<i>Mean</i>	0.565	12.18	1.85; [8.46, 15.90]	<0.001
<i>50th percentile</i>	0.58	13.13	1.86; [9.38, 16.88]	<0.001
<i>75th percentile</i>	0.70	20.69	2.29; [16.10, 25.29]	<0.001
<i>Mean plus 1 SD</i>	0.75	23.85	2.58; [18.67, 29.03]	<0.001
<i>90th percentile</i>	0.80	27.00	2.91; [21.16, 32.84]	<0.001

Source: Authors' conceptualisation (2026)

Estimates are $\alpha_1 + \alpha_3(\text{RG minus } 0.565)$ from Model 2, in percentage points of ROA per unit change in ORA. Standard errors use the insurer clustered covariance matrix, with a covariance between α_1 and α_3 of 1.34. Intervals use the t distribution with 48 degrees of freedom. Observed support of RG: 5th percentile 0.25, 95th percentile 0.87.

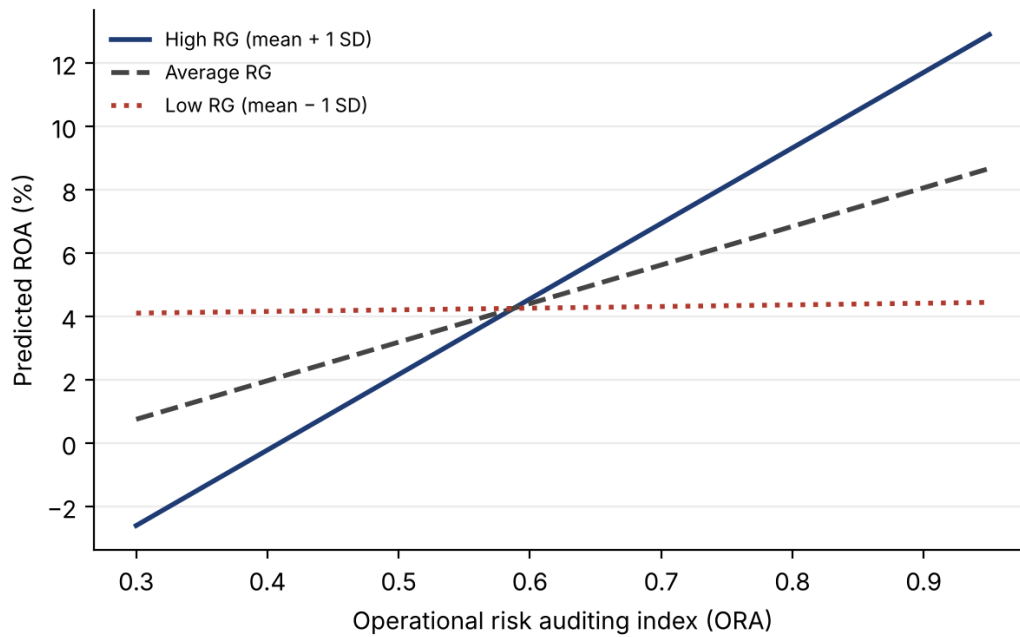


Figure 5.1: Simple slopes of ROA on operational risk auditing at low, average and high risk governance

5.7 Comparison between Kenya and Zimbabwe (H4)

Table 5.8 reports Model 3 as corrected in Section 4.5, with insurer and year effects, no standalone country indicator and indices centred at the pooled means. It also reports Model 3b, which replaces year effects with country by year effects, and Models 2 estimated separately for each country with insurer effects and the same pooled centring. In Model 3 the Kenyan coefficients are the γ terms and the Zimbabwean coefficients are γ plus δ .

The joint Wald test rejects $\delta_1 = \delta_2 = \delta_3 = 0$ in Model 3 ($\chi^2 = 9.4$ with 3 degrees

of freedom, $p = 0.024$, wild cluster bootstrap $p = 0.046$). This shows that at least one difference is nonzero. It does not show that each is. Tested one at a time, only the difference in the moderation term is significant: $\delta_3 = 58.40$ ($p = 0.022$, wild cluster bootstrap $p = 0.043$, CR2 $p = 0.048$). The difference in the ORA association at mean governance ($\delta_1 = 6.80$, $p = 0.172$) and the difference in the RG association ($\delta_2 = 3.90$, $p = 0.284$) are not distinguishable from zero. When country by year effects are added (Model 3b), the joint test no longer rejects ($\chi^2 = 5.9$, $p = 0.117$, wild cluster bootstrap $p = 0.141$) and δ_3 falls to 49.80 ($p = 0.075$). Under the decision

rule in Table 4.3, H4 is therefore only partly supported. There is evidence of a steeper moderation slope in Zimbabwe, and it is not robust to country specific annual shocks such as currency changes and regulatory developments.

The country models show a positive association in both markets. The coefficient on ORA is 9.40 in Kenya and 16.40 in Zimbabwe, the coefficient on RG is 2.70 and 6.60, and the interaction coefficient is 30.80 and 89.60. In Zimbabwe the direct RG coefficient is significant only at the 10 percent level ($p = 0.066$, wild cluster bootstrap $p = 0.082$), while the ORA and interaction coefficients remain significant under all three inference methods (wild cluster bootstrap $p = 0.004$ and 0.009). Significant coefficients within each country are not themselves tests of differences between countries.

Table 5.8b gives the Zimbabwe minus Kenya difference in the ORA association, $\delta_1 + \delta_3(\text{RG minus } 0.565)$, at common values of risk governance. The difference is positive and distinguishable from zero only where RG exceeds about 0.65. At RG of 0.75 it is 17.60 (95% confidence interval 2.95 to 32.26), and at the 90th percentile it is 20.52.

At mean governance it is 6.80 (–3.54 to 17.14), and at low governance the point estimates are negative but imprecise (–4.00 at RG of 0.38). A uniformly stronger relationship in Zimbabwe therefore cannot be inferred from its larger interaction coefficient, because the sign of the gap depends on the level of governance. In Model 3b the gap at RG of 0.75 is 16.71 (0.72 to 32.70, $p = 0.042$), so the high governance result is borderline and not conclusive. Common support matters here. RG exceeds 0.65 in 31 of 141 Zimbabwean firm years (22 percent, from 8 insurers) and in 118 of 320 Kenyan firm years (37 percent), so the high governance gap rests on few Zimbabwean insurers.

One possible explanation is that where the macroeconomic environment is volatile and regulatory capacity is more limited, board oversight may make a larger difference to whether audit findings are acted on. In Kenya, the more developed regulatory framework may mean that most insurers meet a minimum standard (Section 3.4). These explanations are not tested here. The evidence is a conditional difference in a moderation slope that is sensitive to country by year effects, and it is not

used to rank policy priorities across the two markets.

Table 5.8 Model 3 and country models

Variable	Model 3 / Model 3b (pooled)	Kenya	Zimbabwe
<i>ORA centred</i>	Model 3: 9.35*** (1.75) Model 3b: 9.12*** (1.82)	9.40*** (1.52)	16.40*** (3.62)
<i>RG centred</i>	Model 3: 2.60* (1.31) Model 3b: 2.48* (1.36)	2.70** (1.25)	6.60* (3.31)
<i>ORA centred × RG centred</i>	Model 3: 30.10*** (7.40) Model 3b: 28.40*** (7.90)	30.80*** (7.02)	89.60*** (21.80)
<i>ZIM × ORA centred</i>	Model 3: 6.80 (4.90) Model 3b: 7.50 (5.30)	not applicable	not applicable
<i>ZIM × RG centred</i>	Model 3: 3.90 (3.60) Model 3b: 3.10 (3.90)	not applicable	not applicable
<i>ZIM × ORA × RG centred</i>	Model 3: 58.40** (24.60) Model 3b: 49.80* (27.40)	not applicable	not applicable
<i>Controls</i>	Model 3: Yes Model 3b: Yes	Yes	Yes
<i>Insurer effects</i>	Model 3: Yes Model 3b: Yes	Yes	Yes

Variable	Model 3 / Model 3b (pooled)	Kenya	Zimbabwe
<i>Time effects</i>	Model 3: Year Model 3b: Country by year	Year	Year
<i>Centring</i>	Model 3: Pooled means Model 3b: Pooled means	Pooled means	Pooled means
<i>Observations</i>	Model 3: 461 Model 3b: 461	320	141
<i>Insurers (clusters)</i>	Model 3: 49 Model 3b: 49	34	15
<i>R squared (within)</i>	Model 3: 0.452 Model 3b: 0.468	0.401	0.488
<i>Joint Wald test, $\delta_1 = \delta_2 = \delta_3 = 0$</i>	Model 3: $\chi^2(3) = 9.4$, $p = 0.024$ Model 3b: $\chi^2(3) = 5.9$, $p = 0.117$	not applicable	not applicable
<i>Wild cluster bootstrap p, joint test</i>	Model 3: 0.046 Model 3b: 0.141	not applicable	not applicable
<i>Wild cluster bootstrap p, ZIM $\times$ ORA $\times$ RG</i>	Model 3: 0.043 Model 3b: 0.102	not applicable	not applicable

Standard errors clustered by insurer in parentheses. Significance from conventional t tests with G minus 1 degrees of freedom: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Kenya is the reference group in Models 3 and 3b.

Source: Authors' conceptualisation (2026)

Table 5.8b Zimbabwe minus Kenya difference in the ORA association at common values of RG (Model 3)

<i>RG level</i>	<i>RG value</i>	<i>Difference</i>	<i>Std. error</i>	<i>95% confidence interval</i>	<i>p value</i>
10th percentile	0.33	-6.92	7.27	[-22.27, 8.42]	0.355
Mean minus 1 SD	0.38	-4.00	6.42	[-17.54, 9.53]	0.541
25th percentile	0.44	-0.50	5.57	[-12.26, 11.26]	0.930
Mean	0.565	6.80	4.90	[-3.54, 17.14]	0.183
50th percentile	0.58	7.68	4.94	[-2.75, 18.11]	0.139
75th percentile	0.70	14.68	6.13	[1.74, 27.63]	0.028
Mean plus 1 SD	0.75	17.60	6.95	[2.95, 32.26]	0.021
90th percentile	0.80	20.52	7.87	[3.92, 37.13]	0.018

Source: Authors' conceptualisation (2026)

Differences are $\delta_1 + \delta_3$ (RG minus 0.565), in percentage points of ROA per unit change in ORA. Standard errors use the clustered covariance matrix, with a covariance between δ_1 and δ_3 of 9.60. Intervals use CR2 Satterthwaite degrees of freedom of about 17.

5.8 Robustness and sensitivity checks

Table 5.9 reports the pooled Model 2 checks described in Section 4.7, and Table 5.10 reports the country specific and Zimbabwe accounting checks. Each row gives the coefficient, standard error and p value from insurer clustered inference with G minus 1 degrees of freedom, together with the number of

observations, insurers and within R squared. The checks are judged against the decision rules in Table 4.3.

The signs of all three coefficients are unchanged in every check, and the evidence for operational risk auditing (H1) and for moderation (H3) is stable. The ORA coefficient and the interaction coefficient are significant at the 1 percent level in all 17 pooled checks.

When return on equity replaces ROA (447 firm years, because 14 firm years with equity below 5 percent of assets were set to missing), all three coefficients are significant at the 5 percent level or better. When the combined ratio is used (455 firm years, because six firm years had non positive earned premium), where lower values indicate better underwriting performance, the signs reverse as expected and stay significant.

The evidence for the direct association of risk governance (H2) is weaker. The RG coefficient meets the 5 percent decision rule in the baseline model and in 12 of the 17 pooled checks, but falls to the 10 percent level when both indices are lagged (3.10, $p = 0.083$), when composite insurers are excluded (2.40, $p = 0.095$), when no winsorisation is applied (2.40, $p = 0.071$), when the four additional controls are added (2.30, $p = 0.061$) and when 2022 and 2023 are excluded (2.60, $p = 0.051$). Under the rule in Table 4.3, H2 is therefore supported in the baseline specification but is not stable across checks. The lagged result also needs correction relative to earlier drafts: the lagged RG coefficient of 3.10 is larger than the Model 2 coefficient of 2.740, not smaller, and the lagged ORA

(9.80) and interaction (55.40) coefficients are smaller than in Model 2 (12.180 and 63.073). One year lags improve temporal ordering. They do not remove reverse causality, for example from profitable insurers funding stronger structures, or omitted time varying factors.

Equal dimension weights and the narrow ORA index give results close to the baseline. Leaving out each of the 12 dimensions in turn gives ORA coefficients from 9.9 to 13.4, RG coefficients from 2.1 to 3.5 and interaction coefficients from 48.2 to 71.9. The interaction is significant at the 1 percent level in all 12 versions and RG is significant at 5 percent in 10 of them. The results are not driven by the overlapping dimensions. Balanced panel, relaxed eligibility, exclusion of merger years, country specific winsorisation, SIZE as a share of country assets, removing log age, adding a report length control and adding country by year effects leave the conclusions close to the baseline.

In Zimbabwe, excluding 2019 and 2024 lowers the magnitudes (ORA 14.20 against 16.40, interaction 71.30 against 89.60) and the interaction falls from the 1 percent to the 5 percent level, but the

signs and the ORA result remain. Because this exclusion cannot remove inflation effects in the other years, Table 5.10 adds targeted checks. Removing the IAS 29 net monetary position gain or loss from ROA, using historical cost figures where published, adding an IFRS 17 indicator and excluding 2022 and 2023 all leave the ORA and interaction coefficients significant at the 1 percent level. The results for 2015 to 2018 (US dollar period, ORA 12.80, $p = 0.029$) and 2019 to 2024 (ORA 17.50, $p < 0.001$) are similar in sign, although the early period is imprecise with 54 firm years and 12 insurers. Inflation accounting therefore does not appear to drive the Zimbabwean ORA and

moderation results. The direct RG coefficient in Zimbabwe is significant at no better than the 10 percent level in any Zimbabwean check, and under the wild cluster bootstrap in the baseline it is $p = 0.082$.

Overall, the main findings are partly robust. The association of operational risk auditing with ROA, and its increase with risk governance, are stable in sign and significance across the checks. The direct association of risk governance is positive in every check but is less stable. The evidence of a stronger Zimbabwean relationship is limited to the moderation slope at high governance (Section 5.7).

Table 5.9 Robustness of Model 2

Check	ORA	RG	ORA × RG	Sample and fit
<i>Baseline Model 2</i>	12.18*** (1.85), $p < 0.001$, [8.46, 15.90]	2.74** (1.15), $p = 0.021$, [0.43, 5.05]	63.07*** (8.92), $p < 0.001$, [45.14, 81.01]	Observations: 461; Insurers: 49; Within R^2 : 0.429
<i>ROE as outcome</i>	19.40*** (4.80), $p < 0.001$, [9.75, 29.05]	5.80** (2.60), $p = 0.030$, [0.57, 11.03]	98.50*** (21.00), $p < 0.001$, [56.28, 140.72]	Observations: 447; Insurers: 49; Within R^2 : 0.371

Check	ORA	RG	ORA × RG	Sample and fit
<i>Combined ratio as outcome</i>	−21.30** * (6.10), p = 0.001, [−33.56, −9.04]	−6.20** (2.90), p = 0.038, [−12.03, −0.37]	−88.40*** (24.50), p <0.001, [−137.66, −39.14]	Observations: 455; Insurers: 49; Within R ² : 0.352
<i>Lagged ORA and RG</i>	9.80*** (2.50), p <0.001, [4.77, 14.83]	3.10* (1.75), p = 0.083, [−0.42, 6.62]	55.40*** (10.10), p <0.001, [35.09, 75.71]	Observations: 404; Insurers: 49; Within R ² : 0.381
<i>Equal dimension weights</i>	11.60*** (1.90), p <0.001, [7.78, 15.42]	2.90** (1.20), p = 0.020, [0.49, 5.31]	58.70*** (9.40), p <0.001, [39.80, 77.60]	Observations: 461; Insurers: 49; Within R ² : 0.418
<i>Narrow ORA</i>	10.90*** (2.00), p <0.001, [6.88, 14.92]	2.90** (1.20), p = 0.020, [0.49, 5.31]	56.80*** (10.20), p <0.001, [36.29, 77.31]	Observations: 461; Insurers: 49; Within R ² : 0.405
<i>Balanced panel</i>	12.90*** (2.40), p <0.001, [8.00, 17.80]	3.30** (1.50), p = 0.036, [0.24, 6.36]	66.20*** (11.00), p <0.001, [43.74, 88.66]	Observations: 310; Insurers: 31; Within R ² : 0.452
<i>Relaxed eligibility</i>	12.00*** (1.80), p <0.001, [8.39, 15.61]	2.80** (1.10), p = 0.014, [0.59, 5.01]	62.00*** (8.70), p <0.001, [44.56, 79.44]	Observations: 482; Insurers: 55; Within R ² : 0.425

Check	ORA	RG	ORA × RG	Sample and fit
<i>Excluding composite insurers</i>	12.60*** (2.20), p <0.001, [8.14, 17.06]	2.40* (1.40), p = 0.095, [-0.44, 5.24]	65.90*** (11.50), p <0.001, [42.58, 89.22]	Observations: 348; Insurers: 37; Within R ² : 0.440
<i>Excluding merger years</i>	12.10*** (1.90), p <0.001, [8.28, 15.92]	2.70** (1.15), p = 0.023, [0.39, 5.01]	62.40*** (9.00), p <0.001, [44.30, 80.50]	Observations: 453; Insurers: 49; Within R ² : 0.430
<i>No winsorisation</i>	12.90*** (2.10), p <0.001, [8.68, 17.12]	2.40* (1.30), p = 0.071, [-0.21, 5.01]	66.00*** (10.60), p <0.001, [44.69, 87.31]	Observations: 461; Insurers: 49; Within R ² : 0.437
<i>Country specific winsorisation</i>	12.00*** (1.90), p <0.001, [8.18, 15.82]	2.90** (1.20), p = 0.020, [0.49, 5.31]	62.40*** (9.30), p <0.001, [43.70, 81.10]	Observations: 461; Insurers: 49; Within R ² : 0.424
<i>SIZE as share of country assets</i>	12.20*** (1.80), p <0.001, [8.58, 15.82]	2.70** (1.20), p = 0.029, [0.29, 5.11]	62.50*** (9.00), p <0.001, [44.40, 80.60]	Observations: 461; Insurers: 49; Within R ² : 0.431
<i>Without log age</i>	12.09*** (1.84), p <0.001, [8.39, 15.79]	2.81** (1.15), p = 0.018, [0.50, 5.12]	62.50*** (8.90), p <0.001, [44.61, 80.39]	Observations: 461; Insurers: 49; Within R ² : 0.427

Check	ORA	RG	ORA × RG	Sample and fit
<i>Added controls, all four</i>	11.40*** (2.00), p <0.001, [7.38, 15.42]	2.30* (1.20), p = 0.061, [−0.11, 4.71]	58.90*** (9.60), p <0.001, [39.60, 78.20]	Observations: 441; Insurers: 49; Within R ² : 0.447
<i>Report length control</i>	11.80*** (1.90), p <0.001, [7.98, 15.62]	2.50** (1.20), p = 0.043, [0.09, 4.91]	60.70*** (9.20), p <0.001, [42.20, 79.20]	Observations: 461; Insurers: 49; Within R ² : 0.436
<i>Country by year effects</i>	11.90*** (1.90), p <0.001, [8.08, 15.72]	2.60** (1.20), p = 0.035, [0.19, 5.01]	61.20*** (9.40), p <0.001, [42.30, 80.10]	Observations: 461; Insurers: 49; Within R ² : 0.452
<i>Excluding 2022 and 2023</i>	12.50*** (2.00), p <0.001, [8.48, 16.52]	2.60* (1.30), p = 0.051, [−0.01, 5.21]	62.00*** (9.60), p <0.001, [42.70, 81.30]	Observations: 366; Insurers: 49; Within R ² : 0.408

*All models include insurer and year effects (country by year effects where stated). Standard errors clustered by insurer in parentheses. p values and 95 percent confidence intervals use the t distribution with G minus 1 degrees of freedom (30 for the balanced panel, 54 for relaxed eligibility, 36 excluding composites, 48 otherwise). Indices are centred at the mean of each estimation sample (pooled sample means 0.631 and 0.565 for the baseline). The lagged model uses ORA and RG at t minus 1, with the interaction formed from the lagged centred indices, and gaps in reports remove the following year. Significance: * p<0.10, ** p<0.05, *** p<0.01.*

Source: Authors' conceptualisation (2026)

Table 5.10 Country specific and Zimbabwe checks

Check	ORA	RG	ORA × RG	Obs.	Insurers	R² (within)
<i>Zimbabwe baseline</i>	16.40*** (3.62), p <0.001, [8.64, 24.16]	6.60* (3.31), p = 0.066, [-0.50, 13.70]	89.60*** (21.80), p = 0.001, [42.84, 136.36]	141	15	0.488
<i>Zimbabwe excluding 2019 and 2024</i>	14.20*** (3.90), p = 0.003, [5.84, 22.56]	5.80* (2.90), p = 0.065, [-0.42, 12.02]	71.30** (24.00), p = 0.010, [19.83, 122.77]	113	15	0.471
<i>Zimbabwe ROA excluding net monetary gain</i>	14.10*** (3.60), p = 0.002, [6.38, 21.82]	5.90* (3.20), p = 0.086, [-0.96, 12.76]	80.70*** (22.90), p = 0.003, [31.58, 129.82]	141	15	0.462
<i>Zimbabwe 2015 to 2018</i>	12.80** (5.10), p = 0.029, [1.57, 24.03]	3.90 (4.30), p = 0.384, [-5.56, 13.36]	61.00 (38.00), p = 0.137, [-22.64, 144.64]	54	12	0.442
<i>Zimbabwe 2019 to 2024</i>	17.50*** (4.00), p <0.001, [8.92, 26.08]	6.90* (3.50), p = 0.069, [-0.61, 14.41]	92.30*** (24.10), p = 0.002, [40.61, 143.99]	87	15	0.497

Check	ORA	RG	ORA × RG	Obs.	Insurers	R² (within)
<i>Zimbabwe historical cost figures</i>	15.20*** (3.80), p = 0.002, [6.99, 23.41]	6.10* (3.40), p = 0.096, [-1.25, 13.45]	84.20*** (23.30), p = 0.003, [33.86, 134.54]	118	14	0.471
<i>Zimbabwe excluding 2022 and 2023</i>	15.60*** (3.90), p = 0.001, [7.24, 23.96]	6.20* (3.50), p = 0.098, [-1.31, 13.71]	85.00*** (23.50), p = 0.003, [34.60, 135.40]	112	15	0.480
<i>Zimbabwe with IFRS 17 indicator</i>	16.10*** (3.70), p <0.001, [8.16, 24.04]	6.40* (3.40), p = 0.081, [-0.89, 13.69]	87.90*** (22.40), p = 0.002, [39.86, 135.94]	141	15	0.492
<i>Kenya ending 2021</i>	9.20*** (1.60), p <0.001, [5.94, 12.46]	2.50* (1.30), p = 0.063, [-0.14, 5.14]	29.50*** (7.50), p <0.001, [14.24, 44.76]	222	34	0.388

Source: Authors' conceptualisation (2026)

Insurer and year effects included. Indices centred at the pooled means. p values and 95 percent confidence intervals use G minus 1 degrees of freedom: 14 for Zimbabwe, 11 for 2015 to 2018, 13 for historical cost figures and 33 for Kenya.

6. Discussion and Implications

6.1 Summary of findings

The study set out to assess whether disclosed operational risk auditing is associated with the financial performance of general insurers in Kenya and Zimbabwe, and whether disclosed risk governance changes that association. The findings are within insurer conditional associations from observational disclosure data, and they are not causal effects. Operational risk auditing was positively associated with return on assets (H1) in every specification. Risk governance was also positively associated with return on

assets (H2), but this evidence is less stable: the coefficient meets the 5 percent rule in the baseline model and in 12 of 17 pooled checks, and weakens to the 10 percent level in the other five. The association of auditing with return on assets rose with risk governance (H3), and the interaction was significant at the 1 percent level in every check. The evidence for a country difference (H4) is limited. Zimbabwe shows a steeper moderation slope, but the difference is significant only at high governance and is not robust to country by year effects. Table 6.1 sets these findings beside the existing evidence reviewed in Section 3.

Table 6.1: Findings compared with existing evidence

Hypothesis	Finding and stability across checks	Related evidence	Contribution
H1: Auditing and performance	Positive association: a 0.10 higher ORA is associated with 1.13 percentage points higher ROA (Table 5.5) Stability across checks: Significant at 1 percent in all 17 pooled checks (Table 5.9)	Kiptoo, Kariuki and Ocharo (2021); Okemwa (2025); Were (2023); Prawitt, Smith and Wood (2009)	Measures disclosed operational risk audit arrangements specifically, where earlier studies examined risk management or audit controls in general

Hypothesis	Finding and stability across checks	Related evidence	Contribution
H2: Governance and performance	Positive but smaller association: a 0.10 higher RG is associated with 0.40 percentage points higher ROA (Table 5.5) Stability across checks: 5 percent level in the baseline and 12 of 17 pooled checks, 10 percent level in five	Hoyt and Liebenberg (2011); Ellul and Yerramilli (2013); Aebi, Sabato and Schmid (2012); Mahwe (2024)	Extends banking and enterprise risk management evidence to disclosed board level risk governance in two African general insurance markets
H3: Moderation	The association of ORA with ROA is not detected at RG of 0.38 (0.52), is 12.18 at the mean and 23.85 at RG of 0.75 (Table 5.7) Stability across checks: Interaction significant at 1 percent in all 17 pooled checks	Power (2007); Gordon, Loeb and Tseng (2009); Eisenhardt (1989)	In the search described in Section 1, no earlier study was found that tests governance as a condition for the audit performance association

Hypothesis	Finding and stability across checks	Related evidence	Contribution
H4: Country difference	Zimbabwe minus Kenya difference in the ORA association is positive only where RG exceeds about 0.65, and the joint test is not significant with country by year effects (Tables 5.8 and 5.8b) Stability across checks: Not robust	Mahwe (2024); Hanke and Kwok (2009)	A first descriptive comparison of general insurers in the two markets within the search described in Section 1

Source: Authors' conceptualisation (2026)

6.2 Operational risk auditing and financial performance

The positive association of operational risk auditing with profitability agrees with Kenyan studies that link operational risk management (Kiptoo, Kariuki and Ocharo, 2021), internal audit controls (Okemwa, 2025) and risk based internal audit (Were, 2023) to insurer performance. It also fits the finding that stronger internal audit is associated with better control over reporting (Prawitt, Smith and Wood, 2009). Those studies measure risk management or audit controls broadly.

This study measures disclosure on the audit function, its reporting line, its risk based plan and its coverage of underwriting, claims, reinsurance and information systems. It finds that, within insurers, years with more extensive disclosed audit coverage of operational risks are associated with higher profitability. One possible explanation is a reduction in avoidable losses, such as claims leakage, reinsurance recovery errors and system failures, which audit is well placed to detect. The study does not measure any of these losses, so this channel is a theoretical explanation and not a finding.

Other explanations cannot be excluded. Profitable insurers may be better able to fund stronger audit arrangements or to disclose more. Disclosure may also rise because reporting requirements change. Kenya's 2022 risk management and control functions guidelines and Zimbabwe's 2022 governance directive both took effect within the sample, and country by year effects absorb their country wide effect, though not differences in how quickly individual insurers responded. One year lags improve temporal ordering and do not remove these alternatives.

The result also bears on the caution raised by Power (2007) that risk auditing can become ritual, producing documentary assurance without changing how risks are managed. A positive average association does not rule out ritualised assurance for some insurers. The moderation results below are compatible with that concern, because an association was not detected where disclosed governance is weak, but they are also compatible with other explanations, including few observations at low governance. The data cannot distinguish ritual assurance from these alternatives.

6.3 Risk governance and financial performance

Disclosed risk governance is positively associated with return on assets, although the association is smaller than that of auditing and less stable across checks. The direction is consistent with evidence from banking that stronger risk functions and board reporting chief risk officers are associated with better performance (Aebi, Sabato and Schmid, 2012; Ellul and Yerramilli, 2013), with the value premium reported for enterprise risk management in insurance (Hoyt and Liebenberg, 2011), and with Zimbabwean evidence on enterprise risk management and board characteristics (Mahwe, 2024; Sandada, Manzanga and Shamhuyenhazva, 2015). McShane, Nair and Rustambekov (2011) find that the benefit of risk management is not uniform across levels of sophistication. The weaker direct association found here is compatible with that view, but the weakening to the 10 percent level in five of 17 pooled checks, and in every Zimbabwean check, means that this result is best read as suggestive. The moderation results are one way to interpret it, and they do not test it.

6.4 The moderating role of risk governance

The central finding is that the association of operational risk auditing with return on assets depends on disclosed risk governance (Table 5.7 and Figure 5.1). At one standard deviation below the mean governance (RG of 0.38) the estimated association is 0.52 (95 percent confidence interval -4.27 to 5.31), and a nonzero association was not detected. At average governance it is 12.18, and at one standard deviation above the mean it is 23.85. The association is distinguishable from zero for RG above about 0.44. In percentage point terms, a 0.10 higher ORA is associated with 2.39 points higher ROA at RG of 0.75, and not 23.85 points. The pattern is consistent with audit findings being more likely to be acted on where a board risk committee, a chief risk officer or equivalent, and defined reporting lines exist. The study does not observe whether findings were acted on, and the composite index does not identify any necessary committee or officer.

Both theories used in this study predict a pattern of this kind. Agency theory holds that monitoring is effective only where those who receive its output can

act on it (Eisenhardt, 1989). An audit report that reaches a board without a risk committee, or management without a chief risk officer who can challenge it, may be filed rather than acted on. Contingency theory holds that risk management practices yield benefits when they fit the organisational setting (Gordon, Loeb and Tseng, 2009). On this reading auditing and governance are complements. An interaction between two disclosure measures does not, however, prove complementarity in implementation, and the failure to detect an association at low governance does not show that auditing cannot help without particular board structures.

6.5 Differences between Kenya and Zimbabwe

The evidence for differences between the two markets is limited. The associations of auditing and governance with return on assets, and the interaction between them, are positive in both countries. In the corrected Model 3 the joint test rejects equality of the country coefficients, but only the difference in the moderation term is individually significant, and it is not significant at the 5 percent level once country by year effects are added

(Table 5.8). The Zimbabwe minus Kenya difference in the ORA association is positive and distinguishable from zero only where governance exceeds about 0.65, a range with few Zimbabwean insurers (Table 5.8b). At mean governance the difference is 6.80 (95 percent confidence interval -3.54 to 17.14), and at low governance the point estimates are negative but imprecise. A larger Zimbabwean interaction coefficient therefore does not mean a uniformly stronger relationship in Zimbabwe.

Two explanations are consistent with the evidence, and neither is tested here. The first is institutional. In an unstable macroeconomic setting shaped by hyperinflation (Hanke and Kwok, 2009) and repeated currency changes, most recently to the ZiG in 2024 (Reuters, 2024), the quality of control and oversight may matter more for whether an insurer preserves value. Mahwe (2024) notes that this history raised the importance of risk management among Zimbabwean financial institutions. In Kenya, a more stable currency and a more established governance framework may mean that most insurers already meet a minimum standard, which leaves less variation in

performance to be explained by differences in auditing and governance.

The second explanation is measurement. Return on assets is more volatile in Zimbabwe because inflation and currency changes affect reported profits and asset values. Section 4.4.2 describes the protocol used to put the two countries on a comparable basis, and Section 5.8 shows that the Zimbabwean ORA and interaction results hold when the net monetary position gain or loss is removed, when historical cost figures are used, when an IFRS 17 indicator is added and when 2019 and 2024 or 2022 and 2023 are excluded (Table 5.10). The direct governance association in Zimbabwe is weak in all of these. These checks reduce but cannot remove measurement concerns. The comparison is read as evidence that the associations are present in both markets, with differences between them that are conditional on governance and not robust. The study therefore does not rank the two markets or set regulatory priorities by their point estimates.

6.6 Theoretical implications

The findings contribute to the literature in three ways, each within the limits of

an observational disclosure study. First, they show that disclosed operational risk audit arrangements have an association with performance of their own, separate from risk management or audit controls in general. Second, they are consistent with governance as a condition for the association of auditing with performance and not only a separate correlate of performance. This is compatible with a link between agency theory, which explains why monitoring should help, and contingency theory, which explains when it does, although the data do not establish implementation complementarity. Third, they suggest that the strength of the relationship may differ across institutional settings, which would support a contingent rather than

universal account of how risk oversight is associated with performance, but the evidence for such differences is not robust.

6.7 Practical and policy implications

The implications in Table 6.2 are reasoned inferences from the associations found, and they are not findings of the study. The results do not show that audit or governance changes raise profitability. The common point is that audit and governance arrangements appear to go together, so building audit coverage without the governance structures that receive its findings may be less likely to be associated with better performance.

Table 6.2: Implications by stakeholder

Stakeholder	Implication
Boards of insurers	Consider a risk committee with independent members and a chief risk officer or equivalent who reports to the board, and consider having the committee review audit findings and track corrective action.
Internal audit and risk functions	Consider extending risk based audit plans to underwriting, claims, reinsurance and information systems, and reporting findings and follow up through the audit and risk committees.

Stakeholder	Implication
Regulators (IRA and IPEC)	Consider treating audit and governance requirements as complementary, and consider supervisory review that tests whether audit findings are acted on and not only whether the functions exist. The evidence does not support ranking the two markets or prioritising one over the other.
Investors and rating analysts	Disclosure on audit coverage and risk governance may be one indicator of operational resilience alongside financial ratios. Disclosure is not verified audit quality or governance effectiveness.

Source: Authors' conceptualisation (2026)

6.8 Limitations and directions for future research

Several limitations should be noted.

First, the indices measure what insurers disclose about their audit and governance structures, not how well those structures work. A disclosed internal audit function may be weak in practice, and some insurers may disclose less than they do. Two audit dimensions, committee meeting frequency and audit follow up, lie close to governance, and the leave one dimension out results in Section 5.8 limit but do not remove this overlap. Future work could combine disclosure indices with survey or interview

evidence on audit quality and board effectiveness.

Second, the design shows association and does not establish causation. Profitable insurers may be better able to fund audit and governance, and unobserved time varying factors such as underwriting experience, reinsurance arrangements, capital position, business mix and management quality may affect both. Disclosure may also change because requirements and report templates change. Insurer fixed effects, year and country by year effects, lagged indices and the additional controls in Section 5.8 reduce these concerns but cannot remove them. Instrumental variable or

natural experiment designs, for example around the introduction of the 2022 guidelines in Kenya and the 2022 directive in Zimbabwe, would give stronger evidence.

Third, comparability of return on assets across countries and years depends on accounting treatment. Section 4.4.2 and Section 5.8 address inflation accounting under IAS 29, currency changes and the IFRS 17 transition with targeted checks, but residual distortions may remain, especially in the Zimbabwean years of rapid currency change. Statutory Instrument 44 of 2026 came into effect after the observation period and is outside the scope of this study.

Fourth, the sample is a census of eligible reporting insurers, with 49 of 56 licensed insurers, so it may exclude newer, distressed or less transparent insurers. Composite insurers required allocation of general business results. The Zimbabwean subsample has 15 insurers. Small cluster corrections (wild cluster bootstrap and CR2) were applied in the main analysis, but power remains limited, particularly for the Zimbabwean subperiods, and the findings may not generalise to other markets or to life insurance.

Finally, the study examines average associations over 2015 to 2024. Future work could examine whether the associations change when regulation tightens, including after Statutory Instrument 44 of 2026 in Zimbabwe, and could extend the analysis to other African insurance markets.

7. Conclusion

This study examined the association between disclosed operational risk auditing and the financial performance of general insurance companies in Kenya and Zimbabwe, with particular attention to the moderating role of risk governance. Using a panel of 49 insurers over 2015 to 2024, it found that operational risk auditing is positively associated with return on assets in every specification, that risk governance is also positively associated with return on assets but less stably, and that the association of auditing with return on assets is larger where risk governance is higher. Where disclosed governance is weak, an association between auditing and performance was not detected. Where it is strong, the association is large. Evidence of a difference between the two markets is limited to a steeper moderation slope in Zimbabwe at high

governance, which is not robust to country by year effects.

The study contributes in three ways, within the limits of an observational disclosure study. It examines disclosed operational risk audit arrangements specifically, where earlier work examined risk management or audit controls in general. It reports results that are consistent with governance as a condition for the association of auditing with performance, which links agency theory, which explains why monitoring should help, with contingency theory, which explains when it does. And, within the search described in Section 1, it offers a first comparison of general insurers in Kenya and Zimbabwe, two markets with similar regulatory direction but very different macroeconomic conditions.

The practical message, offered as a reasoned implication and not a finding, is that audit and governance arrangements should be considered together. Boards may wish to pair audit coverage of underwriting, claims, reinsurance and information systems with a risk committee and a chief risk officer who can act on audit findings. Regulators may wish to test whether findings are acted on and not only

whether the functions exist. The evidence does not support ranking the two markets or setting priorities by their point estimates. The limitations in Section 6.8 apply, notably the use of disclosure based indices, the difficulty of establishing causation, changing disclosure requirements, and the comparability of reported profits under currency instability in Zimbabwe. Future research could combine disclosure indices with evidence on audit quality and board effectiveness, use designs that identify causal effects, and extend the analysis to other African insurance markets.

Declarations

Author contributions

Silas Salaton Morera:

conceptualisation, methodology, data curation, formal analysis, writing of the original draft. Shadreck Vangana: conceptualisation, methodology, validation, supervision, writing, review and editing.

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Conflicts of interest

The authors declare no conflict of interest.

Data availability

The study uses published information from the audited annual reports of insurers, the annual reports of the Insurance Regulatory Authority (Kenya) and the reports of the Insurance and Pensions Commission (Zimbabwe). The codebook (Appendix A), the item level codes, the firm year source ledger, the cleaned dataset and

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the analysis code (Stata 18 and R 4.4) will be deposited on acceptance.

During review they are available to the reviewers through the journal.

Ethics approval

The study relies exclusively on published information about organisations and involves no human participants. Under the Africa Research University research ethics policy, secondary analysis of publicly available organisational documents is exempt from full ethical review.

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Appendix A: Coding framework

Table A1 Operational risk auditing items

Code	Dimension	Item	Coding rule	Rationale
A1	1 Internal audit function	Internal audit function exists	Report states that the insurer has an internal audit function, in house or outsourced	Monitoring capacity
A2	1 Internal audit function	Charter or mandate referenced	Charter or mandate is named or its content summarised	Formal authority
A3	1 Internal audit function	Head of internal audit identified	Post, reporting seniority or qualifications disclosed	Competence and standing
A4	2 Reporting line	Functional reporting to audit committee	Report states that internal audit reports to the audit committee	Independence from management
A5	2 Reporting line	Committee approves audit appointment, budget or plan	Committee approval of any one of the three is stated	Oversight of the monitor
A6	3 Risk based plan	Risk based audit plan	Plan is described as risk based	Targeting of scarce audit effort

Code	Dimension	Item	Coding rule	Rationale
A7	3 Risk based plan	Plan approved by the audit committee	Approval stated	Oversight
A8	3 Risk based plan	Plan linked to the risk register	Link to risk assessment or register stated	Fit with risk environment (contingency)
A9	4 Operational coverage	Underwriting in audit scope	Underwriting process named as audited	Core insurer operational risk
A10	4 Operational coverage	Claims in audit scope	Claims handling named as audited	Claims leakage risk
A11	4 Operational coverage	Reinsurance in audit scope	Reinsurance arrangements named as audited; not applicable if no reinsurance in the year	Counterparty and recovery risk
A12	4 Operational coverage	Information systems in audit scope	IT or systems audit named	System and data risk
A13	5 Audit committee meetings	Number of meetings disclosed	Number of meetings in the year is stated	Transparency of oversight intensity
A14	5 Audit committee meetings	At least four meetings	Four or more meetings stated	Quarterly oversight cycle

Code	Dimension	Item	Coding rule	Rationale
A15	6 Findings and follow up	Findings reported to the committee	Report states that findings go to the committee	Information flow
A16	6 Findings and follow up	Significant findings or themes summarised	Themes or counts of findings disclosed	Accountability
A17	6 Findings and follow up	Follow up of earlier recommendations tracked	Tracking or closure of recommendations stated	Closing the audit loop
A18	6 Findings and follow up	Management action status reported	Status of remediation reported	Closing the audit loop

Table A2 Risk governance items

Code	Dimension	Item	Coding rule	Rationale
G1	1 Board risk committee	Board risk committee exists	Committee named, board level	Board attention to risk
G2	1 Board risk committee	Terms of reference disclosed	Terms or mandate described	Formal authority
G3	1 Board risk committee	Committee report in annual report	Separate report or section present	Accountability

Code	Dimension	Item	Coding rule	Rationale
G4	1 Board risk committee	Reports to the full board	Regular reporting to the board stated	Information flow
G5	2 Chief risk officer	CRO or equivalent exists	Separate from finance and audit functions	Specialised risk ownership
G6	2 Chief risk officer	CRO qualifications disclosed	Qualifications or experience stated	Competence
G7	2 Chief risk officer	Board approves CRO appointment	Approval or removal by the board stated	Independence
G8	3 CRO reporting line	Reports to board or risk committee	Reporting line stated	Independence from management
G9	3 CRO reporting line	Direct access to committee chair	Private access stated	Escalation
G10	3 CRO reporting line	Independent of underwriting	Separation from revenue functions stated	Conflict avoidance
G11	4 Committee independence	Chaired by an independent non executive	Chair status stated	Independence

Code	Dimension	Item	Coding rule	Rationale
G12	4 Committee independence	Majority independent non executives	Composition stated	Independence
G13	4 Committee independence	Membership names disclosed	Names listed	Transparency
G14	4 Committee independence	Executives attend by invitation only	Stated	Independence
G15	5 Committee meetings	Number of meetings disclosed	Number stated	Transparency of oversight intensity
G16	5 Committee meetings	At least four meetings	Four or more stated	Quarterly oversight cycle
G17	5 Committee meetings	Attendance by member disclosed	Attendance table present	Accountability

Code	Dimension	Item	Coding rule	Rationale
G18	6 Board risk expertise	Director with risk, actuarial or insurance expertise	Named director with stated expertise	Board capability
G19	6 Board risk expertise	Risk training or induction	Training for directors stated	Board capability
G20	6 Board risk expertise	Board evaluation covers risk oversight	Evaluation scope includes risk	Learning and accountability

Appendix B: Item reliability, frequencies and coded excerpts

Item	Disclosure indicator	Kappa	Kenya %	Zim %	2015 %	2018 %	2021 %	2024 %
A1	Internal audit function exists	0.91	98	86	88	92	95	97
A2	Charter or mandate referenced	0.88	91	78	75	82	88	93
A3	Head of internal audit identified	0.87	89	73	71	79	85	91
A4	Functional reporting to audit committee	0.89	92	79	76	83	90	94
A5	Committee approval of audit appointments, budget or plan	0.84	76	59	53	62	71	82
A6	Risk-based audit plan disclosed	0.86	83	66	60	70	79	88

<i>Ite m</i>	<i>Disclosure indicator</i>	<i>Kap pa</i>	<i>Ken ya %</i>	<i>Zim %</i>	<i>2015 %</i>	<i>2018 %</i>	<i>2021 %</i>	<i>2024 %</i>
A7	Audit plan approved by audit committee	0.85	79	62	55	65	75	84
A8	Audit plan linked to risk register	0.79	68	49	42	53	64	74
A9	Underwriting included in audit scope	0.87	86	70	65	74	82	90
A10	Claims included in audit scope	0.88	88	72	67	76	84	92
A11	Reinsurance included in audit scope	0.83	75	57	51	61	72	81
A12	Information systems included in audit scope	0.85	82	63	56	67	79	88
A13	Number of audit committee meetings disclosed	0.90	93	80	78	85	91	95
A14	At least four audit committee meetings	0.89	85	68	63	72	82	90
A15	Audit findings reported to audit committee	0.86	84	65	59	68	79	87
A16	Significant audit findings or themes summarised	0.80	69	48	41	52	63	75
A17	Follow-up of recommendations tracked	0.76	61	33	36	44	52	58
A18	Management action status reported	0.78	57	35	30	39	49	62

Part B: Risk Governance

<i>Item</i>	<i>Disclosure indicator</i>	<i>Kap pa</i>	<i>Ken ya %</i>	<i>Zim %</i>	<i>2015 %</i>	<i>2018 %</i>	<i>2021 %</i>	<i>2024 %</i>
G 1	Board risk committee exists	0.88	94	81	77	85	92	96
G 2	Risk committee terms of reference disclosed	0.86	87	70	64	74	83	91
G 3	Risk committee report in annual report	0.84	80	63	57	67	77	86
G 4	Risk committee reports to full board	0.87	89	74	69	78	85	93
G 5	Chief risk officer or equivalent exists	0.88	86	67	61	72	81	89
G 6	CRO qualifications disclosed	0.80	68	46	38	50	64	76
G 7	Board approves CRO appointment	0.81	71	52	44	56	67	79
G 8	CRO reports to board or risk committee	0.86	83	64	57	68	78	87
G 9	CRO direct access to committee chair	0.79	64	43	35	47	60	72
G 10	CRO independent of underwriting	0.82	73	51	43	56	68	80
G 11	Risk committee chaired by independent non-executive	0.85	82	66	59	70	79	88
G 12	Majority independent non-executives	0.84	79	61	54	65	76	85

Item	Disclosure indicator	Kap pa	Ken ya %	Zim %	2015 %	2018 %	2021 %	2024 %
G 13	Risk committee membership disclosed	0.88	92	77	72	81	89	95
G 14	Executives attend by invitation only	0.77	59	40	32	43	55	68
G 15	Number of risk committee meetings disclosed	0.87	85	68	61	72	82	90
G 16	At least four risk committee meetings	0.85	78	59	51	63	75	85
G 17	Attendance by committee member disclosed	0.83	74	55	47	59	71	82
G 18	Director with risk, actuarial or insurance expertise	0.72	55	39	38	42	49	54
G 19	Board risk training or induction	0.75	53	34	27	38	50	64
G 20	Board evaluation includes risk oversight	0.76	56	37	29	41	53	67

Table B2 Coded excerpts

<i>Item</i>	<i>Excerpt</i>	<i>Code</i>	<i>Reason</i>
<i>A10 Claims in audit scope</i>	Internal audit reviewed the claims settlement process, including reserving and payment authorisation, and reported to the audit committee	1	Names the function, the area covered and the reporting line
<i>A10 Claims in audit scope</i>	The company maintains strong controls over its operations	0	Generic, no area or function named
<i>G5 CRO exists</i>	The Chief Risk Officer, who is independent of the finance function, joined in March	1	Role named and separated from finance
<i>G11 Chair independent</i>	The risk committee is chaired by a non executive director	0	Independence not stated, non executive is not the same as independent

Appendix C: Sample ledger

Code	Country	License d	Years of reports found	Reason for exclusion
KX1	Kenya	2021	2021 to 2024, four years	Fewer than five years of reports possible
KX2	Kenya	2022	2022 to 2024, three years	Fewer than five years of reports possible
KX3	Kenya	Before 2015	2015 to 2017, three years	Statutory management from 2018
KX4	Kenya	Before 2015	2015, 2016, 2018, 2019, 2022	No five consecutive years accessible, longest run two years
ZX1	Zimbabwe	2021	2021 to 2024, four years	Fewer than five years of reports possible
ZX2	Zimbabwe	Before 2015	2017 to 2019, three years	Accessible reports for three consecutive years only
ZX3	Zimbabwe	Before 2015	2016 to 2019, four years	Accessible reports for four consecutive years only

Table C2 Included insurers (n = 49)

Insurer code	Country	Business type	Reporting years	Firm- years
K01	Kenya	General	2015–2024	10
K02†	Kenya	General	2015–2024	10
K03†	Kenya	Composite	2015–2024	10
K04†	Kenya	General	2015–2024	10
K05†	Kenya	Composite	2015–2024	10
K06†	Kenya	General	2015–2024	10
K07†	Kenya	Composite	2015–2024	10

<i>Insurer code</i>	<i>Country</i>	<i>Business type</i>	<i>Reporting years</i>	<i>Firm-years</i>
K08†	Kenya	General	2015–2024	10
K09†	Kenya	Composite	2015–2024	10
K10†	Kenya	General	2015–2024	10
K11†	Kenya	Composite	2015–2024	10
K12†	Kenya	General	2015–2024	10
K13†	Kenya	Composite	2015–2024	10
K14†	Kenya	General	2015–2024	10
K15†	Kenya	General	2015–2024	10
K16†	Kenya	General	2015–2024	10
K17	Kenya	Composite	2015–2024†	10†
K18†	Kenya	General	2015–2024	10
K19†	Kenya	General	2015–2024	10
K20†	Kenya	General	2015–2024	10
K21†	Kenya	General	2015–2024	10
K22†	Kenya	General	2015–2024	10
K23†	Kenya	General	2015–2024; 2016 missing	9
K24†	Kenya	General	2015–2024; 2017 missing	9
K25†	Kenya	General	2015–2024; 2018 missing	9
K26†	Kenya	General	2015–2024; 2019 missing	9
K27†	Kenya	General	2015–2024; 2020 missing	9
K28†	Kenya	General	2015–2024; 2021 missing	9
K29†	Kenya	Composite	2017–2024	8
K30†	Kenya	Composite	2017–2024	8
K31†	Kenya	General	2017–2024	8
K32†	Kenya	General	2017–2024	8

<i>Insurer code</i>	<i>Country</i>	<i>Business type</i>	<i>Reporting years</i>	<i>Firm-years</i>
<i>K33†</i>	Kenya	General	2018–2024	7
<i>K34†</i>	Kenya	General	2018–2024	7
<i>Kenya subtotal</i>	34 insurers	9 composite		320
<i>Z01†</i>	Zimbabwe	General	2015–2024	10
<i>Z02†</i>	Zimbabwe	General	2015–2024	10
<i>Z03†</i>	Zimbabwe	General	2015–2024	10
<i>Z04†</i>	Zimbabwe	General	2015–2024	10
<i>Z05†</i>	Zimbabwe	General	2015–2024	10
<i>Z06†</i>	Zimbabwe	General	2015–2024	10
<i>Z07†</i>	Zimbabwe	General	2015–2024	10
<i>Z08†</i>	Zimbabwe	General	2015–2024	10
<i>Z09</i>	Zimbabwe	General	2017–2024	8
<i>Z10†</i>	Zimbabwe	Composite	2015–2024; 2018 missing	9
<i>Z11†</i>	Zimbabwe	Composite	2015–2024; 2020 missing	9
<i>Z12†</i>	Zimbabwe	Composite	2016–2024	9
<i>Z13†</i>	Zimbabwe	General	2017–2024	8
<i>Z14†</i>	Zimbabwe	General	2017–2024	8
<i>Z15†</i>	Zimbabwe	General	2015–2024	10
<i>Zimbabwe subtotal</i>	15 insurers	3 composite		141
<i>Grand total</i>	49 insurers	12 composite		461

Appendix D: Firm year source ledger

<i>Field</i>	<i>Information recorded</i>	<i>Verification requirement</i>
<i>Insurer identification</i>	Unique insurer code (K01–K34 or Z01–Z15), country and reporting year	Reconcile with the insurer-level sample register in Appendix C
<i>Report identification</i>	Official title of the annual report and financial statements	Match the title to the original audited report
<i>Publication date</i>	Date on which the relevant annual report was issued or published	Verify against the report or official publication record
<i>Source location</i>	Direct URL, regulator document identifier or retrievable archive reference	Record a specific source that enables retrieval of the report
<i>Financial statement pages</i>	Page references for net profit after tax, total assets, liabilities, equity and liquidity-related figures	Identify the precise financial statement or explanatory note supporting each extracted figure
<i>Operational risk auditing disclosures</i>	Page references and binary coding decisions for items A1–A18	Apply the coding definitions and decision rules in Appendix A
<i>Risk governance disclosures</i>	Page references and binary coding decisions for items G1–G20	Apply the coding definitions and decision rules in Appendix A
<i>Accounting basis</i>	Functional currency, presentation currency, monetary units and applicable financial reporting standards	Establish consistency between the reporting basis and extracted financial variables

<i>Field</i>	<i>Information recorded</i>	<i>Verification requirement</i>
<i>Inflation accounting</i>	IAS 29 applicability and treatment of inflation-adjusted financial statements	Record the accounting basis and relevant monetary-position adjustments
<i>Insurance accounting standard</i>	IFRS 4 or IFRS 17, relevant transition year and treatment of comparative figures	Identify the applicable accounting framework and any restatements
<i>Reporting entity</i>	Standalone insurer, consolidated group or separately disclosed general insurance segment	Ensure that extracted figures refer to the appropriate unit of analysis
<i>Regulator reconciliation</i>	Corresponding regulator figure, percentage difference and explanation of material discrepancies	Investigate differences exceeding the 5% threshold described in Section 4.3
<i>Coder identification</i>	Identification of the independent researchers responsible for coding	Support verification of inter-coder reliability
<i>Extraction and verification dates</i>	Dates of initial extraction, independent verification and correction, where applicable	Maintain an audit trail for extracted information
<i>Verification outcome</i>	Confirmation of consistency, correction made or unresolved discrepancy	Document the final status of the observation