

**Lines of defence for combined assurance models: a structured  
literature review**

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master of Philosophy (Evidence-Based Management).

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## **Abstract**

This structured literature review (SLR) evaluates the current state of knowledge on Combined Assurance (CA) by examining and integrating findings from peer-reviewed academic journals. Its objectives are to identify topics covered in CA research, and conceptual inconsistencies or ambiguities, revealing gaps that could enhance understanding, and assessing the maturity level of CA. Topics that emerged were identification of core components of CA and the main stakeholders involved, classifications of the stakeholders within the lines of defence framework, incorporation of lines of defence into various CA models, tools used to strengthen CA, the level of CA adoption in organizations, and the advantages CA provides.

The continued use of the outdated Three Lines of Defence (TLoD) model, mixed opinions on the updated Three Lines Model (TLM) of whether it is an improvement or regression, and contradicting evidence of its effectiveness in the banking sector create ambiguity and inconsistencies around CA. Slow adoption of TLM, lack of consensus on board roles as line of defence, and resistance to internal audit leading CA efforts add to ongoing uncertainties. Research gaps include limited exploration beyond TLoD/TLM, a focus mainly on South Africa, lack of study focused on failure of CA to detect corporate scandals timely, and insufficient evaluation of CA's role in providing assurance on unethical leadership risks. Most studies focus on outward-facing aspects, such as assurance on integrated reporting (IR), while giving little attention to inward-facing or internal perspectives. Although publications are increasing, CA remains underdeveloped. The SLR provides a thorough overview, identifies key trends, highlights gaps, and suggests directions for future research on CA.

**Keywords:** combined assurance, integrated assurance, three lines of defence, four lines of defence, and five lines of defence

## **Declaration**

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Philosophy in Evidence Based Management at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

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# 1 Section 1- Introduction to the review problem

## 1.1 Background

This structured literature review is on Combined Assurance (CA), an integrated assurance applied as an enterprise-wide risk management strategy in business environment. CA is defined as a process of coordinating the efforts of assurance providers to jointly assure governing bodies that significant risks are adequately and appropriately mitigated (Forte & Barac, 2015). CA draws its origin from the following theories:

- i) Enterprise risk management theory: CA is a framework used for risk management in organizations (Schuett, 2024). Enterprise risk management process serves as a foundation for implementing CA (Forte and Barac, 2015). Boujelben and Medhioub (2024) note that cooperation between different assurance functions strengthens the overall efficiency of assurance activities, leading to a more cohesive and holistic risk management approach. CA is used to identify and manage risks more effectively (Maroun, 2022).
- ii) The Corporate governance theory: Enterprise risk management and CA are fundamental and integral components of corporate governance (Forte & Barack, 2015). CA assists those charged with governance in meeting their strategic monitoring, and reporting responsibilities (Maroun, 2022). Decaux and Sarens (2015) argue that all three lines of defence in a CA model play a role in the governance framework by helping organizations manage risks.
- iii) Agency theory: Agency theory highlights conflicts between shareholders (principals) and managers (agents) due to differing goals and incentives. To address these issues, there is a need for effective monitoring mechanisms to limit managerial opportunism, which stems from human tendencies toward self-interest, risk aversion, and misuse of corporate resources (Adebayo & Ackers, 2024; Donkor et al., 2021). Forte and Barac (2015) highlight the value of CA in reducing agency conflicts by enhancing corporate governance and ensuring compliance. According to Ackers (2017), CA also helps to alleviate the information asymmetries. This arises because managers typically have more knowledge about financial activities than shareholders (Boujelben & Medhioub, 2024).
- iv) Stakeholder theory. The collaborative effort between different assurance providers facilitates effective communication channels, reducing the potential for information gaps and ensuring that all relevant parties are well informed (Boujelben & Medhioub, 2024).

CA was first referred to by the then Financial Services Authority in the UK, now part of the Financial Conduct Authority in 2003 (Davies & Zhivitskaya, 2018; Turner, 2022; Valkenburg & Bongiovanni, 2024). King III Code of Governance introduced CA in 2009 (IoD, 2009). In 2016, King III was improved to King IV, and CA was expanded further by emphasising the need for entities to adopt CA under control and stewardship of audit committees (IoD, 2016). King IV lists seven key role players that are responsible for driving effective CA. It however does not classify the role players into lines of defence, nor does it propose or prescribe specific models from the combination of these players (IoD, 2016).

The Institute of Internal Auditors (IIA) published its position paper on CA, what is referred to as Three Lines of Defence (TLoD) in 2013 (IIA, 2013). The TLoD was replaced by what is referred to as Three Lines Model (TLM) in 2020 to provide clarity and improve on the criticism it faced (Brender, et al., 2023). The model has since been adopted by the financial services sector and regulators as best business practice for coordinating risk management within organisations (Turner, 2022). The historical journey of CA is illustrated in the figure below.

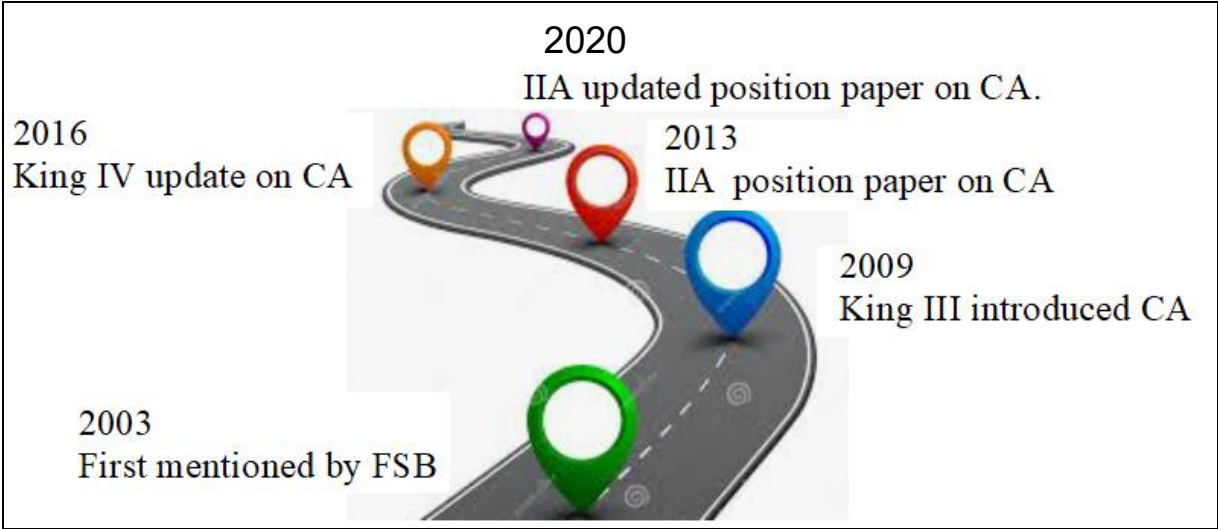


Figure 1: The Author’s illustration of CA historical milestones.

Internal and external stakeholders use integrated reports (IR) to form opinion on organisations’ state of governance and operation. IR had been mandatory for the Johannesburg Stock Exchange (JSE) listed companies since 2010 (Dilla et al., 2023). JSE has made it compulsory for all companies listed on its stock exchange to explain in their IR how they have implemented CA

(Adebayo & Ackers, 2023). The reports, however, do not inspire public confidence (Richard & Odendaal, 2020). The recent corporate failures have raised a need to enhance credibility of the reports (Borgata & Machini, 2021) and the significance of addressing risk events as well as sudden environmental changes (Andersen et al., 2022). CA is regarded as a tool to enhance credibility of IR (Hoang & Phang, 2021a; Hoang & Phang, 2021b; Maroun 2022). Corporate collapses due to scandals and inadequate good corporate governance or risk management, however, persist (Donkor et al., 2021).

## **1.2 Justification for the study**

Despite the over a decade and half since CA was introduced as an assurance strategy, and a number of scholarly articles written about the construct, Maroun and Prinsloo (2020) contend that there is limited understanding about it. This is the basis of this literature review as it seeks to establish the existing body of knowledge by reviewing articles published since its introduction and assess if there are any inconsistencies, underexplained, ambiguous, or neglected contexts, or gaps that might justify the view that there is poor or limited understanding.

Diego-Mantecón et al. (2019) list limited use of the existing theories, use of broad definitions, lack of description and lack of internal consistency of well-known instruments in the literature as factors that lead to a poor applicability of the conceptualizations. Drawing from Diego-Mantecón et al. (2019), the review sought to establish whether the following exists in the literature on CA that might lead to poor understanding:

- i) Undefined key concepts within CA,
- ii) Ambiguity in definitions or interpretations,
- iii) Conflicting perspectives among scholars that may cause confusion,
- iv) Insufficient detail in explanations,
- v) Disconnection between theoretical knowledge and practical application,
- vi) Neglected critical knowledge areas related to CA.

### **1.3 Review questions**

To address the concern of limited understanding and fulfill the objectives of the review, the following review questions were developed:

- i) RQ 1: What topics have researchers focused on in relation to CA since its introduction?
- ii) RQ 2: What inconsistencies or ambiguities exist within these studies?
- iii) RQ 3: What are knowledge gaps in the existing body of knowledge?
- iv) RQ 4: What is the maturity level of CA?

Answers to the above questions assisted in gaining more understanding of what has been covered by scholars, and identification of inconsistencies, ambiguities, inadequate definitions of concepts, and knowledge gaps not covered by scholars. They further assisted in establishing CA state of maturity level.

## **2 Section 2- Methodology**

### **2.1 Methodology outline and justification**

To shape the scope and focus of the search and analysis methodology, the review questions formulated provide the basis for identifying, evaluating, and synthesizing the literature. The methodology followed assisted in answering the following questions:

- i) Which topics have researchers explored concerning CA since its inception?
- ii) What inconsistencies or ambiguities are present across these studies?
- iii) What knowledge gaps persist in the literature?
- iv) What is CA's maturity level?

The search, analysis and synthesis processes were adapted from Popenoe et al. (2021), which began by formulating clear research questions and systematically searching relevant scientific databases. After completing database searches and selecting studies that meet inclusion and exclusion criteria and addressing the research questions, the data analysis phase commenced. The phase entailed developing an article matrix that provided an overview of the selected studies, summarizing each study's objectives, methodology, and key findings, particularly those relevant to the review questions. With the review questions in mind, results from each study were arranged according to emerging themes. Finally, the contents were analysed, synthesized, and presented in a structured and meaningful way.

According to Paul and Criado (2020), the approach followed help researchers to achieve two primary objectives: (1) offering a thorough understanding of the existing knowledge within a specific research area which includes outlining its scope, recognizing inconsistencies along with potential explanations, and constructing a framework to consolidate prior findings; and (2) identifying areas where knowledge is lacking, thereby guiding future research efforts. This is aligned to the review questions and aim of this study.

## **2.2 Search methodology**

### ***2.2.1. Selecting appropriate search terms***

Grey literature from the Institute of Internal Auditors (IIA, 2020) and King IV (IoD, 2016), along with academic publications, were reviewed to identify terms commonly associated with CA. The IIA's literature was chosen as a source as it is recognized for formally introducing the three lines of defence model, which is frequently cited by researchers. King IV was selected for its authority on corporate governance, having first introduced the concept of CA in King III (IoD, 2009). The review identified four related terms or synonyms for CA: integrated assurance, three lines of defence, four lines of defence, and five lines of defence.

### ***2.2.2. Choice of databases to use in the search for literature***

Using the five keywords, combined assurance and its four synonyms, the search was performed across *Web of Science*, *Scopus*, *EBSCOhost*, *Springer Link* and *Emerald Insight* databases. The databases were selected for their credibility and their wide coverage of scholarly literature, particularly in fields such as business and management, which are relevant to CA as a business risk management strategy or tool. In addition, Google Scholar was applied to broaden the search. The search was performed applying Boolean operators “AND,” “OR,” and “NOT” to refine the results by narrowing, expanding, or excluding specific terms.

### ***2.2.3. Selection criteria applied to assess the relevance and the quality of literature.***

#### *i. Determining relevance of articles.*

Only articles in business management, accounting or finance academic disciplines were selected, as the study is about assurance provision on management of risks in business. The filtering by academic discipline or field was carried out by applying the electronic filtering features available in the selected databases.

### *ii. Currency*

The article search was not confined to a specific time frame, after considering that CA was formally introduced by King III in 2009 and subsequently adopted by the IIA in 2013, indicating its relatively recent emergence as highlighted by Boujelben and Medhioub (2024). Limiting the review to only recent studies could potentially overlook foundational research, important theoretical contributions, and shifts in scholarly focus. By including a broader time span, this review provides a more comprehensive understanding of the field's evolution, highlights enduring research gaps, and evaluates its current level of development.

### *iii. Quality*

Articles published in peer-reviewed business management, accounting or finance journals ranked as A\*, A and B as classified by the *ABDC*, levels 4\*, 4, and 3 as classified by the *UK CABS Academic Journal Guide (AJG)*, or Q1 and Q2 as classified by the *SCImago Journal Rank (SJR)* were selected. This criterion was applied as articles from these journals often undergo robust methodology and rigorous data analysis and thereby provide credible and unbiased source. The search by this criterion was conducted through electronic filtering functions available in the databases.

### *iv. Other inclusion or exclusion criteria performed electronically through the databases*

Finalised English language articles were included in the review, regardless of the authors' or publishers' country of origin. Conference proceedings, books, and articles that were still in-press were excluded. Final articles were chosen because they have undergone complete peer review, editing, and approval processes, which ensures their reliability, accuracy, and completeness. In contrast, articles in-press may still be subject to revisions prior to publication.

- v. *Further assessment of relevance of articles to the review question and the study's focus.*

Articles found after performing the above i) to iv) selection steps were downloaded for further screening which involved reading each article's title, abstract and methodology to determine whether they covered the questions that the review was posing or areas of focus it sought to cover. The following assessment criteria and process, adopted from van Dinter et al. (2021) was followed in the screening:

- i) Five criteria were applied, as per table 1,
- ii) Points were allocated on a scale from one to zero to each of the five assessment criteria,
- iii) A point was awarded for the study which met the specific assessment criteria, no point if the study did not meet the criteria and a half-point if it was not clear or not at the expected level,
- iv) Articles with a score of three and above were regarded as relevant and selected for inclusion.

Table 1: Quality checklist

No.	Question
1	Does the title and or abstract contain keywords or themes that match the research question or focus?
2	Are the aims or research questions of the study in the abstract and introduction related to or addressing CA, challenges, or phenomena?
3	Does the article apply or critique the lines of defence, or enterprise risk management theories, as these theories are central to the SLR?
4	Are lines of defence or CA models applied in the study clearly articulated or defined in the article?
5	Are specific details, such as the geographical region, industry and size or details of the entities used in the research, clearly described?

Finally, 50 articles from 33 journals were selected for the research analysis. Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) in the figure 2 below illustrates the search process followed.

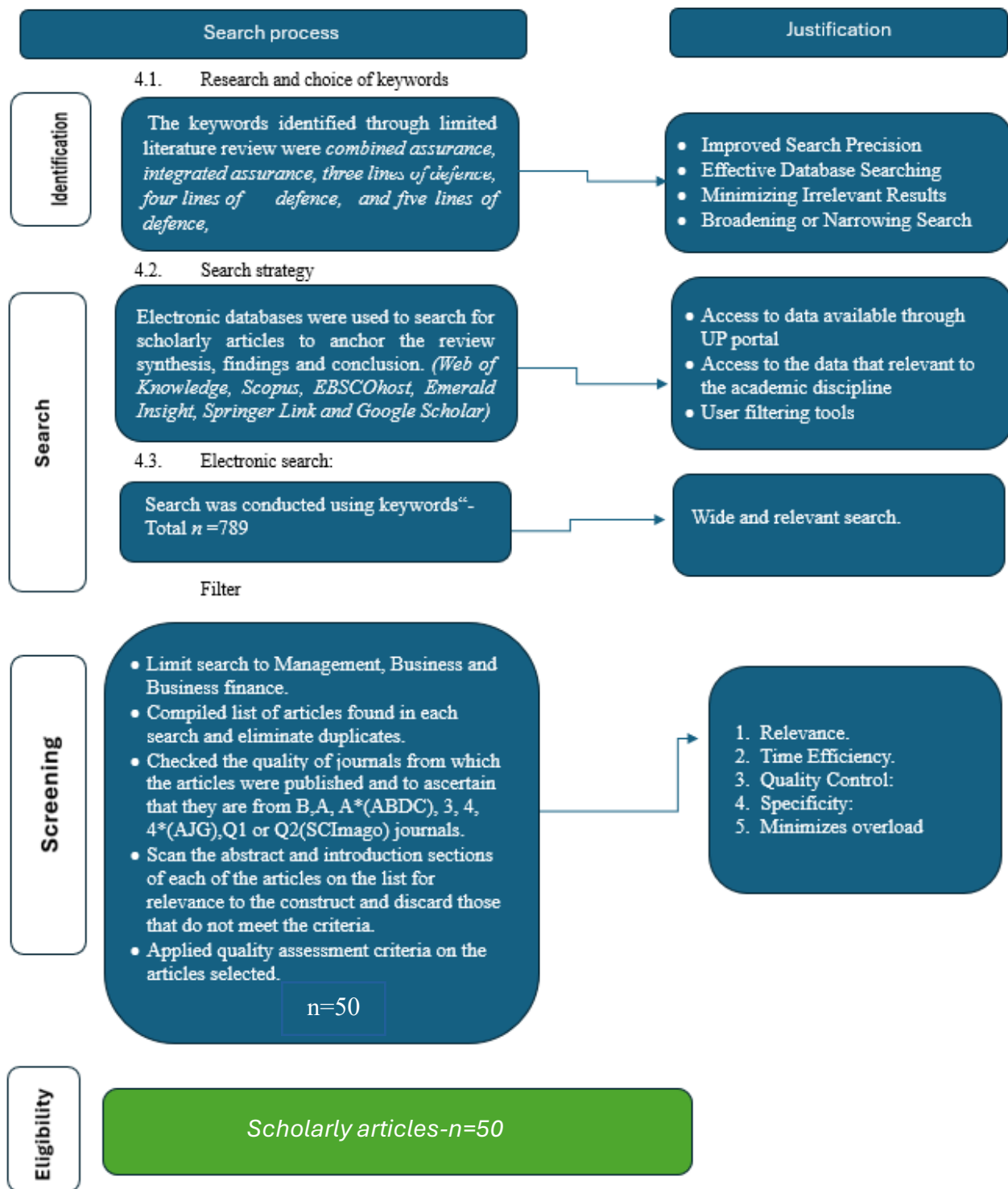


Figure 2: Flow diagram of search methodology adapted from Moher et al. (2009).

## 2.3 Analysis methodology

Content analysis was applied to provide a more comprehensive understanding of the literature being reviewed. The approach made it easier to analyse and synthesize the qualitative data, compare findings, and identify patterns or trends in the literature. Data gathered for each paper was summarised and categorised on a spreadsheet as per table 2.

Table 2: Categorisation of summarised data gathered from literature review for statistical analysis.

No	Category	Purpose
1	Authors.	Identification of the source of data.
2	Year of publishing.	For statistical data analysis.
3	Name of the journal.	For statistical data analysis.
4	Journal rankings.	For statistical data analysis.
5	Objective/focus of the study.	Establish the area of focus and patterns of the studies.
6	Situation applied/assessed.	Note the applicability or CA model in a particular set up or circumstances.
7	Methodology of gathering data and data analysis.	Note common methods applied for gathering data, analysis, and justification thereof.
8	Subject or industry or geographical location where the data was gathered.	Note the applicability of the model in a particular industry and geographical regime.
9	Type of CA model applied in the study.	Identify models applied and circumstances.
10	Outcome (Findings and conclusion).	Note the findings and the synthesis thereof.
11	Limitations.	Note the limitations of each article.
12	Areas for future research.	Note areas for future research.

## 2.4 Data synthesis

The approach adopted in the synthesis was as follows:

- i) Established the topics covered by the scholars since CA inception to answer review the question 1.
- ii) Assessed whether topics covered were clearly defined, with no ambiguity and no inconsistencies among authors that might cause confusions or poor understanding, which addressed the review question 2.
- iii) Checked if there were knowledge gaps related to CA in responding to the review question 3.

iv) Drew conclusions regarding the maturity level of CA from content analysis and synthesis in response to the review question 4.

## **2.5 Limitation**

Limitations in a study pertain to potential weaknesses that typically lie outside the researcher's control and are closely linked to factors such as the chosen research design, constraints imposed by statistical models, budgetary restrictions, and other external influences (Theofanidis & Fountouk, 2018). Using five databases and Google scholar in the search provided reasonable but not absolute assurance that the search would be wide to find all relevant papers. With a multiple highly credible databases existing, a total of six databases is a fraction of what is available, but it was not feasible to enquire using all databases.

## **2.6 Delimitations**

Delimitations are intentional boundaries set by researchers to define the scope of their study, ensuring that the research remains focused and achievable within the established objectives (Theofanidis & Fountouk, 2018). Excluding articles solely based on journal rankings in an attempt to prioritise quality can result in the omission of well-conducted studies published in non-ranked journals. This may lead to important contributions to the literature being missed.

### 3 Section 3: Findings from literature review

The findings were structured based on the review questions. Statistical and thematic analyses were applied to identify and examine topics explored by researchers since the introduction of CA, which is the focus of review question 1. The analyses further addressed the second review question by pointing out inconsistencies, and ambiguities within the studies. The third question, which was focused on identifying knowledge gaps, was addressed through the synthesis of results. Additionally, statistical analysis supported the response to the question regarding the maturity level of CA.

#### 3.1 Statistical analysis

Statistical analysis was extracted from the data compiled and summarized on a spreadsheet. Table 3 shows that 50 articles selected were spread across 33 journals, with most having one article each, except for six journals which featured between three and four articles each. The table further indicates that all of the selected articles were published in *SCImago*-ranked journals, with 40 (80%) classified as Q1 and the remaining 10 (20%) as Q2. A total of nine (18%) out of the 50 publications were from journals ranked by the *AJG*. Of these, seven (78%) were ranked 3, while two (22%) were ranked 2. Articles from journals ranked by *ABDC* were 35 (70%), 25 (71%) of which were ranked A, eight (23%) ranked B, and two (6%) ranked A\*.

Table 3: Distribution of articles by Journal

No	Journal name	Journal count	Journal ranking		
			AJG	ABDC	SJR
1	Accounting and Finance	3	2	A	Q1
2	Administrative Sciences.	1	-	-	Q2
3	AI and Society.	1	-	-	Q1
4	Asian Journal of Accounting Research.	1	-	-	Q2
5	Auditing: A Journal of Practice and Theory.	1			Q1
6	British Accounting Review.	2			Q1
7	Business Strategy and the Environment.	1	3	A	Q1
8	Computers and Security.	1	-	-	Q1
9	Corporate Governance.	1	2	C	Q1
10	Corporate Governance: International Review.	1	3	A	Q1
11	European Accounting Review.	1	3	-	Q1

No	Journal name	Journal count	Journal ranking		
			AJG	ABDC	SJR
12	European Competition Journal	1			Q2
13	Financial Accountability and Management.	2	3	A	Q1
14	Global Policy	1			Q1
15	Information Security Journal	1			Q2
16	International Journal of Accounting Information Systems.	2	2	A	Q1
17	International Journal of Auditing.	3	2	A	Q1
18	International Journal of Disclosure and Governance	2	2	B	Q2
19	International Journal of Economics and Accounting.	1	-	-	Q1
20	Journal of Applied Accounting Research.	1	2	B	Q1
21	Journal of Central Banking Theory and Practice.	1			Q2
22	Journal of Cleaner Production.	1	1	A	Q1
23	Journal of Financial Crime.	1			Q1
24	Journal of Management and Governance.	3	1	C	Q1
25	Journal of Risk and Financial Management	3	-	-	Q2
26	Journal of Tianjin University Science & Technology.	1	-	-	Q2
27	Long Range Planning.	1	4	A	Q1
28	Managerial Auditing Journal	4			Q1
29	Meditari Accountancy Research.	3	1	A	Q1
30	Risk Analysis.	1	4	A	Q1
31	SN Business Economics.	1	-	C	Q1
32	Sustainability Accounting, Management and Policy Journal.	1	2	B	Q1
33	Sustainability Journal	1			Q1
	<b>Grand total</b>	<b>50</b>			50
	Total articles from journals ranked 3, 4 or 4*/B,A, or A*.		9	35	
	% articles from journals ranked 3, 4 or 4*/B,A, or A*/Q1 or Q2.		18%	75%	100%

Approximately a quarter of studies were on South African entities according to table 4. The second and third highest were Europe and Australia & New Zealand with 5 with 3 respectively.

Table 4: Distributions of articles by geographical area

RSA	Ghana	Europe	Australia & N.Zealand	Sultanate of Oman	Britain	GCC countries	Total
12	1	5	3	1	1	1	50
Singapore	Colombia	Across countries	Indonesia	Not stated			
1	2	1	1	21			

Table 5 indicates that the number of publications about CA remained consistent at an average of two per year up to 2019. A noticeable increase occurred in 2020 and 2023, each with seven publications, while a peak was reached in 2024 with 15 articles recorded. A total of 39 (78%) articles selected were published between the period 2020 to 2025, and this mitigated the risk of obsolescence and irrelevance of this study's findings.

Table 5: Distributions of articles by year of publishing

Year	Count of Year	%
2015	2	4%
2016	2	4%
2017	4	8%
2018	2	4%
2019	1	2%
2020	7	14%
2021	4	8%
2022	5	10%
2023	7	14%
2024	15	30%
2025	1	2%
<b>Total</b>	<b>50</b>	<b>100</b>

Table 6 indicates that researchers predominantly opted for a single method of data collection, with secondary data and literature reviews each counting 14 (28%) out of 50, collectively totaling 28 (56%). In contrast, the use of a combination of two or three methods was minimal, comprising only 8%.

Table 6: Distribution by data collection method

No	Single method of collection	Count
1	Interviews	9
2	Surveys/ questionnaire	6
3	Secondary data collection/ content analysis	14
4	Literature review/reference	14
5	Experiment	2
6	Case study/ observation	1
7	Document analysis	0
	<b>Subtotal</b>	<b>46</b>
8	Multi method	
8.1	Secondary and document analysis	1
8.2	Interview, secondary data and document analysis	2

No	Single method of collection	Count
8.3	Interview and observation/case study	1
	<b>Subtotal</b>	<b>4</b>
	<b>Grand total</b>	<b>50</b>

According to table 7, TLoD/TLM dominated the discussion as 31 (62%) of the articles focused on the model. Only one focused on the four lines of defence model and four articles on the five lines of defence model, while another 14 did not specify any particular model.

Table 7: Distribution by CA model applied

Three lines of defense	Four lines of defense	Five lines of defense	Not classified/ stated	Total
31	1	4	14	<b>50</b>

## 3.2 Thematic analysis

The articles highlighted key components of CA, role players, and how these role players are organised into lines of defence, different CA models and ways in which the lines of defences are deployed in each of the models, benefits derived by companies that apply CA, tools that can be applied to enhance CA, and the extent to which CA has been adopted. The topics are discussed in detail hereunder.

### 3.2.1. Key components of CA

Decaux and Sarens (2015) identified the following six key components necessary for successfully implementing a CA program.

- i) Risk management maturity – CA effectiveness depends on the organization's existing enterprise risk management maturity, and it is not a one-size-fits-all solution.
- ii) CA awareness – Organizations must build understanding and awareness of CA, especially at the board level, to gain support and recognize its benefits in improving oversight and control effectiveness.
- iii) Assurance champion – A dedicated coordinator, often internal audit, should manage CA implementation, with ultimate responsibility resting with the board or audit committee.
- iv) Assurance strategy – Identify assurance needs using both top-down and bottom-up approaches to address key risks relevant to the board, executives, and stakeholders.

- v) Assurance mapping – Map out all assurance providers and assign appropriate lines of defence, clearly defining roles to avoid duplication or gaps.
- vi) Reporting – Produce a unified CA report with standardized language and methodology to support effective board and audit committee oversight.

### **3.2.2. Key role players in combined assurance and lines of defence**

The articles highlighted 7 key role players in CA models. These were consistent with King IV. The role players referred to in the literature were as follows:

#### *i. Management*

Management function encompasses operational management, internal controls, and staff engaged in daily operations (Boujelben & Medhioub, 2024; Luburić, 2017; Maroun & Prinsloo, 2020). Management are risk owners and bear responsibilities of risk identification, assessment, designing, implementing, monitoring and evaluating control measures (Eulerich et al., 2025; Slapničar et al., 2025; Tawfik et al., 2023). They are tasked with setting up and maintaining effective structures and procedures for managing risk (Luburić, 2017; Schuett, 2024). Management must also keep the governing body informed about how these measures are performing, whether risk-related goals are being met, and the overall risk exposure. The communication should be ongoing, involving regular updates on both projected and actual outcomes (Kagias et al., (2024).

#### *ii. Internal risk and compliance monitoring functions*

The functions include specialists in risk management, compliance, quality assurance, environmental, health, and safety oversight (Boujelben & Medhioub 2024). The units support the first line of defence by providing guidance, and reporting on adherence to policies and regulations. The internal risk and compliance monitoring functions further support management in risk assessment and compliance reporting (Westhausen, 2017). They assist in the identification of risks but are not involved in or responsible for the implementation of controls (Héroux & Fortin, 2024; Schuett, 2024). Schuett (2024) explains that the functions plays a key role in overseeing and critically evaluating how effective and appropriate the organization's risk management

practices are. The chief risk officer typically serves as the central figure responsible for ensuring the risk management framework is properly implemented and maintained.

### *iii. Internal Audit*

Internal audit operates independently from company management to evaluate and provide insights into how well governance structures and risk management systems are functioning (Schuett, 2024). Internal auditors are tasked with examining the effectiveness of risk management and control mechanisms and offering suggestions for enhancements (Boujelben & Medhioub, 2024).

Schuett (2024) notes that while the board of directors is ultimately responsible for supervising management, they often depend on information supplied by executives. The author argues that to ensure effective oversight, the board requires an impartial and trustworthy source of information, which is where internal audit plays a crucial role. Internal audit reports directly to the board, through the audit committee (Scheld et al., 2016). By maintaining independence from management and reporting directly to the board's audit committee, internal audit assists the board to fulfill its oversight function (Fenelon et al., 2024). Tawfik et al. (2023) explain this within the framework of agency theory in that the board and audit committee delegate the internal audit function to advise and report on the effectiveness of the organization's internal controls, helping to bridge the information gap between executives and the board.

Research indicates that while external auditors currently dominate the evaluation of corporate social performance, internal auditors are well-positioned to bridge compliance and operations by leveraging their audit expertise and organizational insight to enhance sustainability efforts (DeSimone et al., 2021). Findings by DeSimone et al. (2021) show a significant positive relationship between internal audit function involvement in risk assessment initiatives and the publication of sustainability reports with their participation in sustainability audits. Their study additionally found that organizations operating in environmentally sensitive sectors and those with more established internal audit function are more inclined to engage them in sustainability audit activities.

Soh and Martinov-Bennie (2015) found internal audit to be more engaged with social and governance aspects of ESG, while their involvement in environmental matters remained minimal. The study highlighted the need for the internal audit profession to close the existing skills gap in delivering assurance and consulting on ESG matters, in order to remain relevant and effectively meet stakeholders' expectations for integrated assurance

*iv. External Auditors*

External auditors play a crucial role in an organisation's overall governance and control framework. As part of their audit risk model, they are required to assess risks and evaluate the effectiveness of internal controls (Botes et al., 2020).

*v. Other external independent assurance providers*

External and independent assurance providers other than the external auditors are appointed for specific tasks based on the specific and unique expertise that they possess, and they often belong to recognized professional bodies. They provide assurance on for example sustainability report, conduct forensic or complex audit requiring specialist field (Donkor et al., 2024; Richard & Odendaal, 2020). The appointments of external independent assurance providers differ from those of external auditors in that they are not mandatory for organizations but rather optional. However, in certain situations, companies may face considerable pressure to engage an assurance provider to show adherence to best practice codes (Maroun, 2022).

External independent assurance providers are often needed as a credibility enhancement tool (Yan, et al., 2022). Maroun (2019) found that South African companies with externally verified environmental, social, and governance (ESG) disclosures or components exhibit higher levels of integrated reporting quality. Germany companies face coercive pressures to seek external assurance for their integrated reports (Hossain et al., 2023). Similarly, Maroun (2019) confirms that South African companies are influenced by coercive forces to pursue assurance for their integrated reports. The author notes that additionally, societal expectations, governance structures, stakeholder accountability, as well as normative and mimetic pressures, also play a role to some degree, in deciding whether to engage external independent assurance providers for specific specialist areas.

*vi. Board and its Committees*

The board of directors is responsible for approving the organization's risk appetite and monitoring whether executive management operates within the established risk tolerance (Agarwal, & Kallapur, 2018; Slapničar et al., 2025). In its strategic capacity, according to Slapničar et al. (2025), the board is involved in shaping and refining core strategic goals such as defining risk appetite and key risk indicators, setting the standard for risk assessment and safeguarding the independence of assurance functions. Haiji and Anifowose (2016) findings consistent across various measures of IR practices and controls for company-specific factors and ownership structures, reinforce the idea that the audit committee, as an internal assurance provider, plays a crucial role in CA models by strengthening the credibility and reliability of broader organizational reporting processes, especially the IR.

*vii. Regulators*

Regulators occasionally establish rules and requirements to enhance organizations' internal controls, and at other times, independently and objectively evaluate all or part of the first, second, or third lines of defense in relation to those rules (Botes et al., 2020). Agarwal and Kallapur (2018) found that regulatory pressure to enhance risk culture can positively impact even companies with advanced risk governance systems, including CA and strong leadership support for risk management.

**3.2.3. Lines of defence**

The seven role players listed above are structured into five lines of defence. The first three lines consist of management as the first line, internal risk and compliance monitoring functions as the second, and internal audit as the third (Eulerich et al, 2025; Slapničar et al., 2025; Tawfik et al, 2023). There is general agreement on the role players assigned to these three lines of defence, as no literature presents a differing perspective on this. However, there are differing opinions on the composition of the fourth line. One view regards external auditors, independent external assurance providers, and regulators collectively as the fourth line (Boujelben & Medhioub, 2024; Schuett, 2024). Conversely, another perspective excludes regulators from external assurance providers, assigning them a separate role as fourth line of defense (Brender et al., 2023), while

external auditors and other external independent assurance providers represent the fifth, and thereby translating into five lines of defence.

There are additional two versions of the fifth line of defence. One viewpoint argues that the Board and its committees contribute not only as oversight but also substantial assurance, warranting their placement as fifth line in addition to external assurance providers as fourth line (Botes et al., 2020). The other perspective excludes external assurance providers altogether, proposing that all lines of defense consist solely of internal functions, with senior executives and line managers assigned distinct lines, and the Board designated as the fifth line of defense (Slapničar et al., 2023; Valkenburg & Bongiovanni, 2024).

#### **3.2.4. Combined assurance models**

The review identified five types of models or ways in which the lines are combined and coordinated.

##### *i) Three lines of defence*

The TLM is composed of three key components, namely actors, roles, and relationships (Schuett, 2024). It identifies four main actors, shown as dark blue boxes in figure 3: the governing body, which holds accountability to stakeholders for overseeing the organization; management, responsible for executing actions to meet organizational goals; internal audit, which delivers independent assurance to the governing body; and external assurance providers, who also offer independent oversight. Additionally, the model outlines four distinct roles, depicted as light sky-blue boxes as in figure 3.

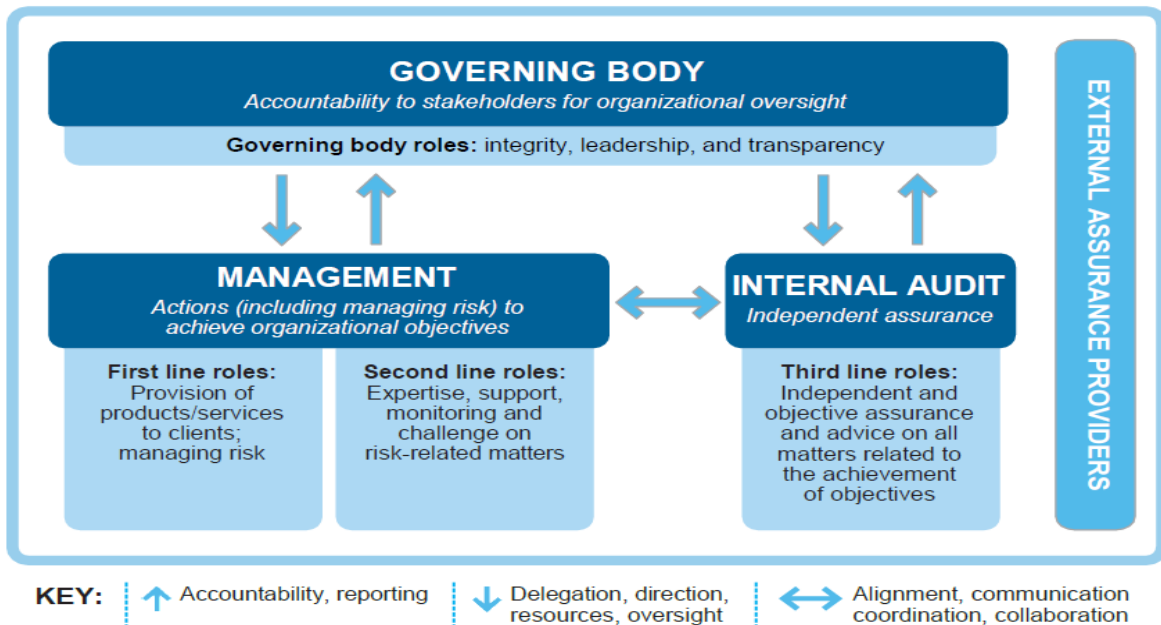


Figure 3: TLM model.

Source: IIA (2020).

Boujelben and Medhioub (2024) emphasise that effective risk management requires close collaboration among all three lines of defence. This includes exchanging information, aligning their efforts, and drawing on each other's expertise and insights. Furthermore, maintaining open and transparent communication is crucial, involving consistent reporting, sharing of findings, and joint discussions on risk-related strategies and challenges (Donkor et al., 2021; Maroun & Prinsloo, 2020). Agarwal and Kallapur (2018) consider the three lines of defence model to be a foundational framework that offers general guidance on the responsibilities of different stakeholders at various organizational levels in managing risk. According to them, the primary goals of the first, second, and third lines of defence are risk management, risk oversight, and providing assurance, respectively.

Tawfik et al. (2023) highlight that the TLM offers a clear and straightforward approach to improving communication around risk management and control by clearly defining key roles and responsibilities and has proven to be a dependable and effective framework across various industries. In comparison to other models, the TLM is regarded as the most thoroughly developed and clearly defined risk management system to date (Tawfik et al., 2023). Valkenburg and Bongiovani (2024) acknowledge that the TLM helps in clarifying roles and responsibilities in

cybersecurity governance, they however note practical implementation challenges such as poor communication between lines, ambiguous definitions, and a lack of empirical evidence supporting its effectiveness. They also found that the model's integration into cybersecurity practices was inconsistent and recommended enhancements, including transitioning to five lines of assurance model that promotes more active engagement from senior management and the board.

In TLM the external assurance providers are not considered part of the lines of defence. Lim et al. (2016) noted that external auditors, who operate outside the three lines of defense framework are experiencing a decline in their jurisdiction authority and argue for their inclusion as fourth line of defence. In their study specific to the banking sector, Lim et al. (2016) found that traders often exploit their superior knowledge, and the three lines of defence is ineffective in preventing this. They argue that the issue stems from a core power imbalance, where traders hold greater status and expertise than control functions.

#### *ii) Four Lines of Defence*

The second model is named for its inclusion of four distinct lines. The first three lines mirror those found in the TLM and the fourth line is composed of supervisory bodies (regulators), external auditors, and other external assurance providers who are expected to collaborate closely with internal audit functions (Schuett, 2024). The model suggests a triangular relationship as depicted in figure 4, where internal auditors collaborate closely with regulators and external auditors share relevant assessments and insights, benefitting from information provided by both internal auditors and supervisors.

According to Boujelben and Medhioub (2024), the external auditors as part of the fourth line contribute significantly to the assurance framework by offering an independent evaluation of governance, risk management, and internal controls. Unlike the first three lines, which operate within the organization, the fourth line provides an objective, outsider's viewpoint, potentially identifying issues overlooked by internal teams, and this independence, Boujelben and Medhioub (2024) argues that is a key factor that sets the line of defence apart.

Botes et al. (2020) add that when there is effective coordination, external parties such as auditors, regulators, and other external assurance providers can serve as an additional layer of defence, delivering assurance to key stakeholders including senior management and the governing body. Schuett (2024) notes that the four lines of defence model was introduced to better address the unique requirements of financial institutions.

Critics of this approach, however, argue that CA should be led solely by internal assurance providers, rather than including external parties (Davies & Zhivitskaya, 2018). Figure 4 is an illustration of the model as adopted from Bank for International Settlements 2015.

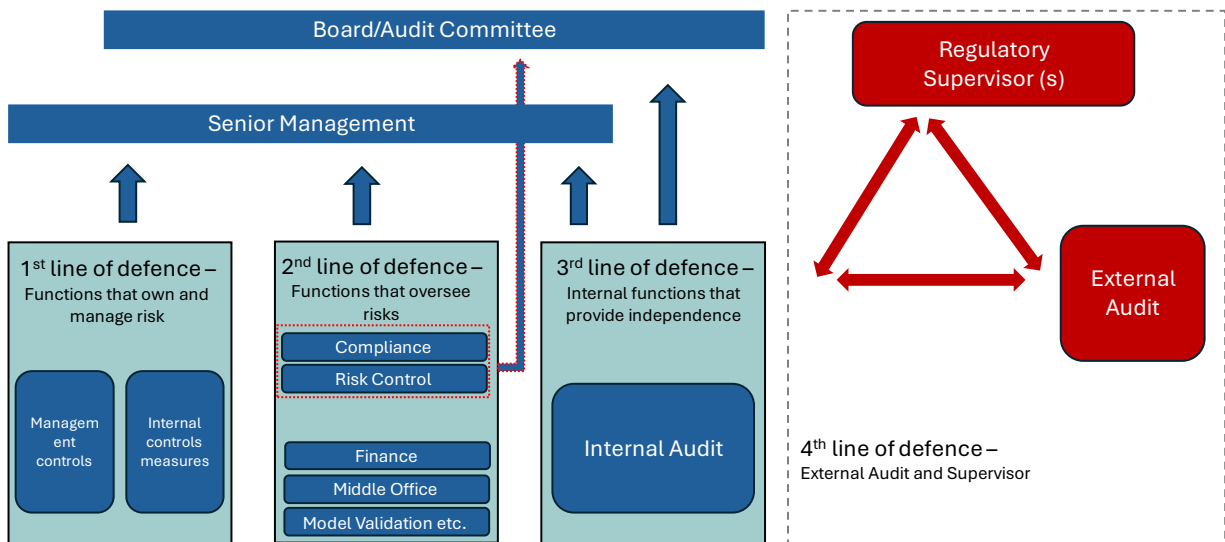


Figure 4: The four lines of defence model

Source: Bank for International Settlements 2015.

### iii) Five lines of defence

The five lines of defence model consists of five separate layers. Researchers categorise this model into three distinct configurations. In each version, the first three lines correspond with the TLM, while the differences emerge in how the fourth and fifth lines are structured.

a) First type-In this type, regulators are separated from external auditors and independent assurance providers, with the former considered as fourth and the latter as fifth line respectively (Vousinas, 2021). Brender et al. 2023 suggest recognising regulators as a fourth line of defence, particularly in highly regulated sectors like banking and insurance is appropriate. Figure 5 illustrates type 1 of five lines of defence model,

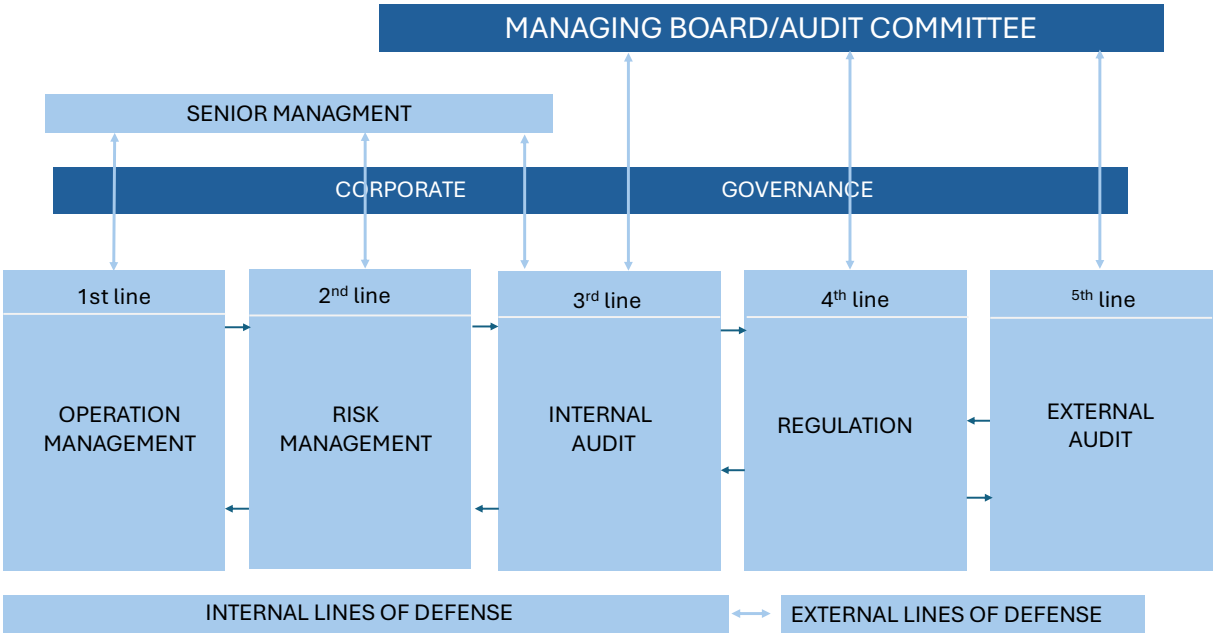


Figure 5: Five line of defence-type 1

Source: Vousinas (2021).

b) In the second type of five lines of defence model, external assurance bodies and regulators, are collectively fourth line of defence and governance structures, board and its committees are fifth (Botes et al., 2020). According to Botes et al. (2020), King IV emphasises that addressing corporate greed and risk should go beyond mere defence, focusing instead on strengthening the reliability of corporate reporting for sound decision-making. Botes et al. (2020) consider King IV to have transformed the TLM into a model comprising five lines of assurance. They argue that the five lines of assurance integrates and enhances all assurance functions, aiming to create an effective control environment, ensure the accuracy of information for internal use by management and governance bodies, and uphold the credibility of the organization's external reporting. The opposing view against this model is

that boards and their committees should not be part of the lines of defence's structure as they play an oversight role and should therefore not assume management roles (Davies & Zhivitskaya, 2018). Figure 6 elaborates the five lines of defence which is based on King IV.

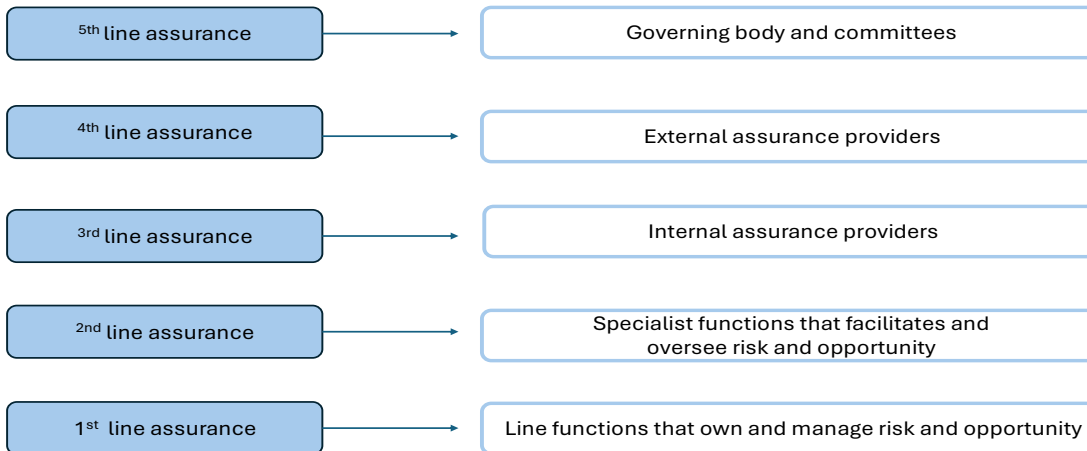


Figure 6: Five lines of defence type 2.

Source: Adebayo & Ackers (2024).

- c) Type 3 five lines of defence model excludes all external assurance providers from the lines of defence. Instead, it separates management into hierarchy and designates business unit leaders, as first line of defence and the CEO as well as senior managers as the fourth line. It assigns the board and its committees the role of the fifth line. Slapničar et al. (2023) view this model as an extension the TLM by including executive management and the board of directors as vital components in cybersecurity governance.

Valkenburg and Bongiovani (2024), in the systematic literature review explored the application of the TLM in the context of cybersecurity governance and view it as an area of increasing concern given the rise in cyber threats and suggests improvements such as the adoption of a five lines of assurance model, which emphasizes active involvement from senior management and the board. Figure 7 illustrates type 3 of model.

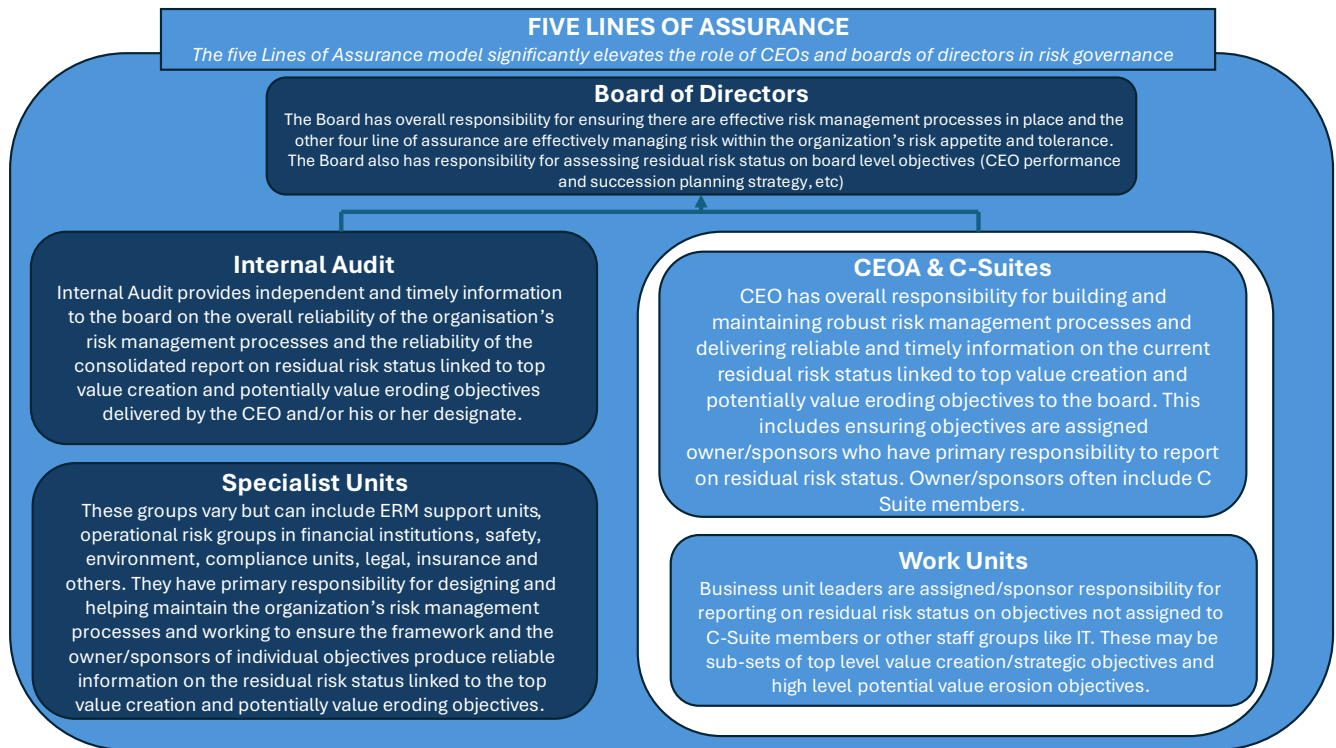


Figure 7: Five lines of defence type 3.

Source: Slapničar et al. (2023).

Slapničar et al. (2023) explain that in most industries, there is limited regulatory pressure to implement the five lines of assurance model and governance decisions typically driven by goals of efficiency and effectiveness play a role. Slapničar et al. (2023) however, underscore that in the banking industry, the adoption of the model is compulsory as a prerequisite for operation. In contrast, non-regulated sectors tend to favor more flexible and streamlined governance arrangements, often merging or omitting roles, as they are not subject to the same external pressure to formally adopt the model (Slapničar et al., 2023). Valkenburg and Bongiovanni (2024) note that the adoption of the five lines of assurance model is uncertain, as recent research shows that most companies are not even aware of its existence. Schuett (2024) adds that the four and the five lines of defence models have gained significantly less traction compared to TLM. The author further adds that critics against the extension of TLM argue that the modifications to the TLM to the four or the five lines of defence model may not lead to improvements, as introducing additional lines could make the model overly complex and in addition, both firms and regulators appear reluctant to adopt structural changes.

### **3.2.5. Benefits derived from adopting CA.**

A total of eight benefits are highlighted across the articles reviewed.

#### *i. Positively influencing investors' decision making*

Donkor et al. (2025) study of selected companies listed on the JSE revealed that strong IR improves the communication of the CA model, which in turn enhances liquidity in capital markets. The study revealed that high-quality CA has a significant impact on financial capital market liquidity by enhancing investor confidence in the credibility of financial reports, which in turn positively influences their investment decisions. This indicates that robust quality assurance practices can rebuild investor trust, even in situations where earnings management may heighten information asymmetry. Furthermore, effective CA greatly enhances investors' trust in non-financial information and boosts their readiness to invest in companies with poor financial performance (Hoang & Phang, 2021b). Hoang and Phang (2021b), however, found that the influence weakens when companies perform well financially, as they established that CA had little to no effect on investor perception or willingness to invest under such conditions.

#### *ii. Credibility enhancement and reduces information asymmetry*

Giraldo et al. (2024) note that the developments in assurance approaches call for a shift toward CA, which fosters collaboration between internal and external assurance providers to produce a thoroughly verified report. They argue that the approach ensures comprehensive coverage and a reasonable level of assurance, enhancing the overall reliability of the sustainability report. Beyond the independent assurance conducted in accordance with established standards, CA serves as an alternative approach to enhancing the credibility and reliability of CSR, sustainability, and integrated reports (Hossain et al., 2023; Maroun, 2017). A strong positive relationship was found between CA quality and credibility of both integrated and sustainability reporting quality among listed companies in South Africa (Donkor et al., 2025; Richard & Odendaal 2020). Zhou et al. 2019 found that CA does not only serve as an effective new mechanism for enhancing the credibility of integrated reports, but it is particularly appreciated by capital market participants, notably analysts, in their earnings forecasting activities.

The study by Hoang and Phang (2021a), CA showed to significantly enhance investors' perceived reliability and willingness to invest particularly when there are high reliability. The study concludes that the inclusion of CA serves as a credibility-enhancing mechanism, reinforcing the reliability of CSR information, particularly in adverse situations where companies face greater scrutiny and potential concerns about greenwashing. Grassmann et al., (2022) established that the inclusion of an assurance statement in an integrated report significantly reduces information asymmetry when combined with strong capital connectivity disclosure.

A systematic literature review by Yan et al. (2022), identified obstacles to effective sustainability assurance as limited stakeholder involvement, ethical issues related to the independence of assurance providers, and weaknesses in supporting infrastructure. The review emphasizes that, unlike financial reporting, sustainability reporting is mostly voluntary and lacks standardized guidelines, resulting in inconsistent disclosure quality. Similarly, Borgato and Machini (2020), in their examination of assurance of IR in Italy, point out challenges such as the absence of appropriate assurance criteria within the IR framework, difficulties in verifying qualitative and forward-looking content, and underdeveloped internal systems within companies. The authors argue that these factors contribute to poor disclosure practices and hinder the assurance process for IR.

### *iii. Enhance cybersecurity effectiveness*

CA enhances cybersecurity effectiveness through the TLM, a framework used for risk management in organizations (Héroux & Fortin, 2024). Several key benefits derived from the implementation of the TLM in cybersecurity were highlighted by Valkenburg and Bongiovanni (2024) as:

- a) TLM offers a structured approach for identifying and mitigating cyber risks. It enables multiple lines of defence to assess controls, improve risk detection, and efficient as well as timely response.
- b) The model clearly defines the duties across the three lines, enhancing organizational structure, ownership, accountability, and transparency. This clarity supports better cybersecurity governance and alignment with corporate governance.
- c) TLM helps organizations address increasing IT interconnectivity and evolving threats by aligning cybersecurity practices with business goals and risk appetite. It provides

assurance to executives and boards and facilitates communication with regulators and auditors.

- d) The interaction between the first and second lines helps prioritize risks and optimize internal controls, enabling more focused cybersecurity investments and efficient resource allocation.

Ramalho et al. (2024) demonstrate the relationship between cyber, IT, and digital risks in relation to the TLoD, and how these risks are integrated into the framework. The study highlights the responsibilities of the first and second lines, while also extending to the third line and external assurance providers.

Vuko et al. (2024) highlight the importance of improving the cybersecurity expertise of internal audit and board members. They advocate greater cooperation among the various lines of defence to achieve more effective cybersecurity outcomes. There is a need for organizations that are developing and deploying AI systems to manage associated risks for economic, legal, and ethical reasons (Schuett, 2024). Schuett (2024) contends that TLM is the best practice risk management framework that could assist AI companies in assigning and coordinating risk management roles and responsibilities. Overall, TLM is seen as a comprehensive and practical framework that strengthens cybersecurity governance through improved structure, oversight, and alignment with broader organizational objectives (Valkenburg & Bongiovanni, 2024).

#### *iv. Enhance whistleblowing effectiveness*

Kagias et al. (2024) asserts that the application of TLM on whistleblowing enhances it as it clarifies the roles and responsibilities within an organization regarding governance and risk management. To demonstrate how whistleblowing fits within TLM, Kagias et al. (2023) suggest that the first line promotes reporting of misconduct by employees and other potential whistleblowers, the second line, such as the compliance function, handles investigations, and the third line evaluates the overall whistleblowing framework and its controls.

*v. Better Risk Management and enhanced control*

Tawfik et al. (2023) suggest that adopting the TLoD model can lead to enhanced control, better risk management, and improved governance in corporate settings. Established frameworks like the TLoD and the COSO enterprise risk management framework can effectively support antitrust risk management by embedding it within the bank's broader risk management processes (Scheld et al., 2016). Lim et al. (2017), however, present contrasting findings, suggesting that both regulatory frameworks and the TLoD model for risk management in banks are less effective than generally believed. They question whether institutional approaches adequately address risk management failures in the banking sector, suggesting that widely accepted regulatory and industry-endorsed models may be fundamentally flawed.

*vi. Encourages compliance and avoid taking risk as tax avoidance*

Firms that adopt the CA approach demonstrate lower levels of tax risk and are less inclined to engage in aggressive tax avoidance strategies (Boujeban & Medhioub, 2024). This implies that CA discourages non-compliance with tax laws.

*vii. TLM model enhances governance maturity*

Implementation of the TLM enhances governance maturity through better defined roles and responsibilities (d' Arcy, 2023). There is a positive and significant relationship between the TLoD and strengthened governance, specifically operational management's adherence to legal, regulatory, and ethical standards, along with the roles of risk management, compliance, and internal audit, which all contribute to better governance (Tawfik et al., 2023).

*viii. CA enhances financial performance*

The analysis of data by Andersen et al. (2022) from a representative sample of large Danish companies revealed a positive link between the implementation of first and second lines of defence practices and improved financial performance. This suggests that integrating risk management practices throughout the organization, in line with enterprise risk management principles, can lead to enhanced overall performance.

### **3.2.6. Application of technological tools to enhance CA**

#### *i) Process mining*

Process mining uses event logs from information systems to analyze, discover, monitor, and improve actual business processes (Jans et al., 2011). While several studies have investigated how process mining can be applied to specific elements of the TLM, there is a lack of comprehensive research examining its use across all three lines (Eulerich et al., 2025). Eulerich et al. (2025) highlights the potential of process mining as an assurance tool within the corporate governance framework and proposes that 1) in the first line, it can uncover segregation of duties issues, verify compliance with operational controls, and evaluate data integrity, 2) in the second line, it supports risk identification, assessment, and monitoring by analyzing process variations, allowing for timely interventions and 3) for the third line, internal audit can utilize process mining for planning, conducting audits, and gaining insights into compliance and control effectiveness. Eulerich et al. (2025) argue that if process mining is effectively implemented across all three lines, it can significantly enhance the effectiveness, efficiency, and resilience of an organization's governance and assurance systems.

#### *i) Blockchain technology.*

Brender et al. (2023) explore how blockchain technology can enhance risk management and internal controls by streamlining documentation and reinforcing stakeholder accountability. Their study notes several benefits, including improved data accuracy, more efficient auditing, and the potential for continuous audit practices. The authors suggest that using blockchain within the Blockchain-Based Control Framework could transform audit functions from reactive to proactive, encouraging collaboration, transparency, and efficiency across organizational boundaries. However, they acknowledge challenges such as system inflexibility, high maintenance demands, and difficulties in integrating with current IT systems as possible negative factors.

### **3.2.7. Extent of adoption and application**

#### *i. South Africa*

JSE listed companies are expected to adopt CA in accordance with King IV principles and disclose so in their IR (Adebayo & Ackers, 2023). Maroun and Prinsloo (2020) key findings reveal that larger firms, while financially successful, do not necessarily implement sophisticated CA models, and larger boards with diverse experience tend to leverage their governance capabilities instead of heavily relying on formal assurance methodologies.

#### *ii. Ghana*

Grebe and Max (2023) identified statistically significant relationships between risk culture and various elements within the Ghanaian banking sector, including monitoring and reporting procedures, TLoD, compliance, internal auditing, disclosure of operational risk information, and regulatory guidance from the banking authority. The study found that Ghanaian banks with a fully established risk culture to support their operational risk management practices tend to strongly support the use of the TLoD for managing operational risk compared to banks with only a partially developed risk culture.

#### *iii. Europe*

France and Germany show efforts to integrate risk management into broader management systems, although gaps remain (Gourbier et al., 2024). Italy is still developing its risk management practices with limited integration into overall management frameworks (Eulerich et al., 2025). Eulerich, et al. (2025) underscore the need for a paradigm shift in risk management perspectives within public organizations, proposing that recognizing risks as potential opportunities could enhance performance and adaptability in the face of evolving public sector challenges

Cantù et al. (2024) suggest that in public healthcare organizations in Emilia-Romagna, Italy, the internal audit function can enhance its integration within the internal control system by mapping and aligning processes, fostering collaboration across various organizational units, and serving as a mediator between differing interests. A case study of a Swedish Bank by Kashyap and Iveroth

(2020) highlights the importance of the TLM model in risk management and how the regulatory changes affected the internal structure, processes, and roles associated with risk control. The study notes a shift towards more structured compliance functions and a deeper engagement with regulatory frameworks but emphasizes ongoing issues like information overload and ambiguous transparency outcomes.

Bantleon et al. (2021) note the following regarding coordination of CA in Austria, Germany, and Switzerland study:

- a) Coordination challenges varied significantly depending on factors such as company attributes, characteristics of the internal audit function, and the nature of stakeholder relationships.
- b) Nearly 90% of companies surveyed indicated that they had implemented the TLM, with 45% reporting no difficulties.
- c) Publicly listed companies and those demonstrating strong collaboration between the internal audit, management, and oversight bodies encountered fewer obstacles.
- d) The financial sector faced more pronounced coordination problems, especially in interactions with compliance functions and external auditors.

#### *iv. Indonesia*

Nurdiani (2022) found that financial institutions in Indonesia have expanded the use of the TLM beyond financial oversight to cover all areas of banking operations. This evolution aims to reinforce core principles, extend the model's reach, and clarify how key roles within the organization work together to enhance governance, resilience, and risk management.

## **4 Section 4: Synthesis Of Literature Review**

Section 4.1 synthesises topics covered by the articles regarding CA, whereas section 4.2 highlights ambiguities and inconsistencies noted in response to questions 1 and 2 respectively. Sections 4.3 and 4.4 identify knowledge gaps in the literature to cover review question 3 and section 4.5 addresses question 4 by assessing the maturity level of CA in the light of information gathered in literature review.

### **4.1 Topics covered by the articles in relation to CA since it was introduced**

#### ***4.1.1 CA role players***

The topic about role players was well and completely defined by the literature. The distinction of the roles were justified in accordance to what each's area of responsibility and the impact that they have on CA. The number and roles are also aligned with those outlined in King IV.

#### ***4.1.2 CA Models***

##### *i) Three lines of defence*

There is general agreement on the composition and functions of the lines of defence, with the TLM forming the foundational structure of CA. All other models build upon this by adding additional lines. A significant portion of the literature references this model when discussing CA, and in many cases, it is treated as synonymous with CA as it was observed that authors often refer to TLM when addressing CA in a broader context.

CA framework involves coordinating both internal and external assurance activities to enhance oversight of risk and governance, improve control efficiency, and provide more comprehensive assurance to the audit and risk committee (Haiji and Anifowose, 2016). TLM, however, does not formally recognize external assurance provider as a line of defence. The argument that CA should

be limited to internally sourced assurance is however unconvincing as it is inconsistent with the core principle of CA, which is the optimal use of all available assurance resources.

Failing to acknowledge external assurance providers as a line of defense can be counterproductive, especially in situations where appointment of external auditors are mandatory. External assurance providers deliver critical assurance services, and their work and opinions should be formally integrated into the CA framework as part of the broader lines of defense. As such, it is logical and efficient to fully leverage their assurance contributions.

*ii) Four lines of defense*

The inclusion of external service providers as part of the lines of defence is well justified, as mentioned i) above. Incorporating external providers aligns closely with the fundamental objective of combined assurance which is to optimize the use of all available assurance resources.

External assurance providers often bring a high level of expertise and diverse skill set which can significantly enhance the effectiveness of CA when properly integrated. However, there is variation in how this additional line of defence is defined. Some sources include external auditors, forensic specialists, and assurance providers in specialized areas such as sustainability and environmental compliance, along with regulators. Others, however, exclude regulators from this category.

The inclusion or exclusion of regulators is not necessarily a point of confusion but rather depends on contextual factors such as the role and influence of the regulator within a given industry. In sectors where regulators are less active or lack enforcement power, their convergence with other external assurance providers as one line of defense may be appropriate. Conversely, in industries where regulators are highly proactive and possess significant authority, it may be more suitable to consider them as a separate assurance mechanism.

*iii) Five lines of defense*

The literature present this model as if there is only one type of five lines of defence. But comparing the views and illustration, three types are deduced, making the available models five instead of three as commonly presented.

*Type 1 :Separating the regulator from other external assurance providers as a line of defence*

The distinction between regulators and other external assurance providers is warranted due to their distinct roles, authority, and influence. In cases where regulators are consistently active in oversight and their findings carry significant consequences, it is logical to treat them as a separate line of defense. This is evident in industries such as mining, where health inspector reports can result in the suspension of operating licenses or funding. A similar scenario exists in the banking sector.

*Type 2 :Inclusion of board and board committees as line of defence*

In this approach, the board and its committees are expected to contribute to assurance efforts as part of the CA, ensuring that all relevant role players are actively involved and recognized within the lines of defense framework. While the number and roles of these participants in these models are aligned with the principles of King IV, it's important to note that King IV does not explicitly categorize them into lines of defence or prescribe a specific model for doing so. As highlighted in the findings, there is a differing opinion on whether the board and its committees should be considered part of the lines of defence. This brings up the classic concern of "who oversees the overseers," particularly given that shareholders are often too removed to provide meaningful oversight themselves. In light of the evolving business landscape and the growing incidence of major corporate failures, both financial and environmental, the audit committee's core responsibilities are broadening to encompass oversight of additional organizational processes beyond just financial reporting (Soh & Martinov-Bennie, 2015). Haiji and Anifowose, (2016) argue that most existing literature still primarily focus on audit committees' influence on financial reporting quality. The authors, however, find a strong positive link between the overall effectiveness of the audit committee and the breadth and quality of IR practices, specifically, the

authority of the audit committee and the frequency of its meetings significantly enhance IR practices.

*Type 3 : Separation of business unit leaders from the CEO and Executive as line of defence*

In this model external assurers are left out as a fourth line of defence. The model instead introduces business unit leaders, distinct from executives, in their place. However, this separation and exclusion seem unnecessary, as their roles and responsibilities can be accommodated within the same line of defense regardless of their levels of seniority in the organization. The model appears to align with the perspective that only internal resources should be included in the lines of defence and merely expanding it to five lines by distinguishing management roles by hierarchy. The rationale for excluding external assurers is unconvincing, especially when considering that a key objective of combined assurance is to coordinate and optimize all assurance activities.

The presence of multiple models and the non-prescriptive nature of King IV allow CA to be applied flexibly, adapting to the specific resources and circumstances of each organization. The interconnectedness and application of roles players, lines of defence and CA models is illustrated in the figure 8 below.

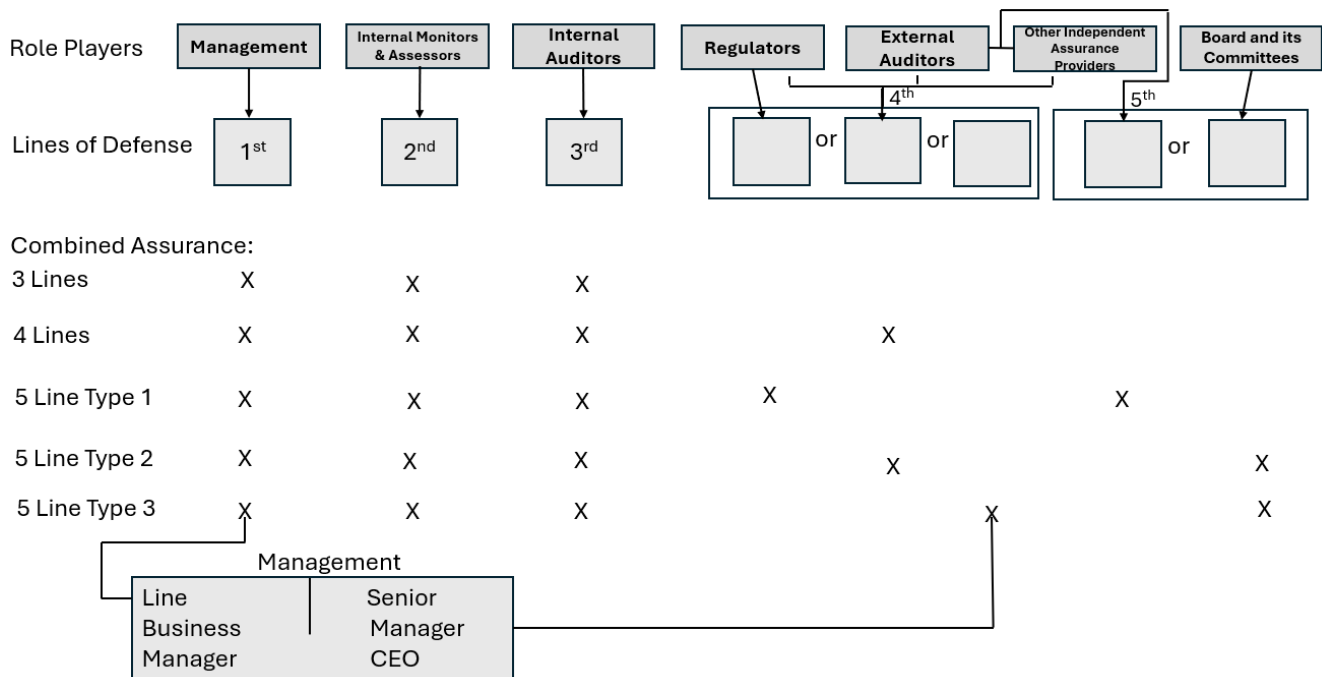


Figure 8: Authors illustration of relationships between roles players, lines of defence and various CA models.

The diagram shows how role players are organized into different lines of defense in various ways, based on the specific type of CA model applied.

### **4.1.3 Benefits**

#### *i) Credibility enhancements*

Numerous studies examined this aspect, consistently finding that CA enhances credibility. This credibility is particularly important to stakeholders such as current and potential investors when making investment decisions, especially in contexts where there is a risk of information being manipulated. The consistency of these findings across various scenarios reinforces the strength and reliability of the conclusion that CA enhances the credibility of information presented in reports by organizations.

#### *ii) Other benefits*

While similar levels of support as credibility enhancement were found for other benefits highlighted in the literature reviewed with ample empirical testing, further research in different contexts would help strengthen the broader conclusion. For instance, Boujeban and Medhioub (2024) found that CA discourages firms from engaging in aggressive tax avoidance that might attract the attention of tax authorities. This finding prompts the question of whether CA could have a similar impact in other industries, such as mining by deterring environmentally questionable behaviors that might draw scrutiny from environmental regulators.. Further studies by other researchers to cover the example cited are necessary to either validate or challenge these claims, which is essential for academic rigor.

### **4.1.4 Tools applied**

The growing interest in adopting modern technological tools such as blockchain, process mining, and AI is a positive and innovative development, highlighted in the literature is noted. These technologies improve effectiveness by enabling assurance providers to respond more quickly, accurately, and in real time. Moreover, such advancements inject new energy into traditional

concepts, which risk becoming outdated and irrelevant if not adapted to current technological trends.

## **4.2 Inconsistencies and ambiguities highlighted**

Schuett (2025) emphasizes the importance of coordination among assurance providers, particularly in the context of frontier AI. However, the author identifies the following barriers that hinder effective coordination:

- i) Assurance activities are still largely disjointed, with an emphasis on red teaming and model evaluation, while internal governance is frequently neglected,
- ii) The absence of well-established best practices in frontier AI assurance makes joint efforts more challenging,
- iii) Ongoing changes in safety procedures and governance frameworks hinder the development of consistent, standardized assurance methods, and
- iv) Developers of frontier AI systems often fail to recognize the need to coordinate their assurance efforts.

Sheedy and Canestrari-Soh (2023) found that many concerns with TLM stem from unclear role definitions and weaknesses in the first line of defense. Seidenfuss et al. (2023) argue that while the TLM addresses major criticisms of TLoD and introduces important new principles, it also brings about added complexity and loses the original model's coherence and simplicity, and this has slowed adoption, particularly among regulators. The authors noted the following challenges with TLM:

- i) The TLoD model was adopted relatively quickly due to its practical clarity, particularly for regulators and practitioners, as by 2015, it had become the primary framework for allocating control and risk management responsibilities within organizations, which is something not experienced with TLM.
- ii) TLM is rarely referenced in current research, with most academic and industry literature still favoring TLoD.
- iii) There is also no clear evidence that regulators, oversight entities, or professionals have begun transitioning to TLM.

Internal audit standards assign the responsibility of coordinating CA to the internal auditor (Abdelrahim & Al-Malkawi, 2024). Gaining senior management's support is essential to foster collaboration among assurance providers, promote information sharing, address key risks, and align their plans with the internal audit function (Decaux & Sarens, 2015). However, Abdelrahim and Al-Malkawi (2024) found that in Gulf Cooperation Council companies, senior management often failed to adequately support internal audit's leadership role in CA. They attribute this to a lack of understanding or appreciation of internal audit's role in leading and coordinating CA.

### **4.3 Methodology of collecting data**

The data collection methods used for analysis were primarily manual, relying on published IR records. While data from official reports may enhance credibility and reduce the risk of bias, such data might be incomplete, selectively presented, or manipulated to support a specific narrative. Data collected could be more useful if they undergo a form of testing for bias before they are used for analysis.

A number of studies used questionnaires. Questionnaire in particular are cost-effective and can reach a large sample size (Grebe & Max, 2023). They allow respondents to participate in the privacy of their own space, often anonymously, which can lead to more honest and credible responses (Grebe & Max, 2023). However, questionnaires, especially open-ended ones, tend to lack depth and detailed insights, and there's no opportunity to clarify questions if they are misunderstood. Survey methods fall short in capturing such complexities and are vulnerable to social desirability and other biases, particularly relevant in highly regulated sectors like financial services (Keiser & Payne, 2019).

Other studies collected information using interviews. In contrast to the questionnaire, interviews offer richer data due to direct interaction, allowing researchers to probe deeper and clarify responses through follow-up questions, potentially yielding more nuanced and accurate information. The interviews allow researchers to delve into these complexities and examine topics that may be influenced by impression management especially semi-structured interviews allowed for in-depth insights into and understanding of the perceptions of individual participants (Sheedy & Canestrari-Soh, 2023).

Four out of the 50 articles (8%) employed a combination of two to three data collection methods for analysis. Utilizing multiple methods helps to overcome the limitations associated with relying on a single approach.

#### **4.4 Knowledge gaps in the literature**

A significant portion of the literature focuses on South Africa, which is warranted by the country's recognized leadership in governance, making it an ideal context for examining CA (Boujelben & Medhioub, 2024). Its strong assurance traditions and the landmark King III report in 2009, marking the first global mention of combined assurance, signaled a major shift in focus. The King IV further developed the concept, improving its effectiveness and application. As a result, South Africa has become a key global leader in the advancement of CA practices. However, the narrow focus on one or few countries raises the risk of redundancy, offering limited new insights. Conducting research within a well-established and relatively uniform context might obscure critical limitations, edge cases, or failure points of the concept being studied. Such an environment can artificially inflate the perceived success of a framework by eliminating real-world complexity, diversity, and unpredictability, thereby creating a misleading sense of reliability and applicability.

The literature largely focus on IR. Although the significance of studying IR is undeniable, other business areas are equally important. This skewed approach may hinder opportunities for interdisciplinary learning and innovation that could refine or expand the core concept. It could also weaken the evolution of robust lines of defense theories, which would benefit from validation across varied contexts. Moreover, IR is primarily concerned with external reporting, which may inadvertently skew the perception of CA as being significantly externally oriented. In reality, CA is equally vital for internal reporting and therefore, research that examines its applications on for example business efficiencies could significantly enhance understanding and contribute to addressing the conceptual gaps.

## **4.5 Maturity level of CA**

King III, which introduced the concept of CA, came into effect on 1 March 2010 in South Africa. It applied broadly to all types of entities, regardless of size or nature, reflecting a shift toward a more inclusive and integrated approach to corporate governance, marking 15 years since CA was first introduced. The review of the literature revealed that published articles on CA were limited and remained relatively steady until 2024, when a noticeable increase indicated growing interest in the topic. Most of the publications identified during the literature search date from the early to mid-2010s. Additionally, research has shown that scholarly work on assurance models beyond the TLoD/TLM is either scarce or nonexistent. When all of the mentioned facts are considered as whole, they highlight that CA is underdeveloped. This finding aligns with the observations made by Boujelben and Medhioub (2024) that CA is still a relatively embryonic practice.

## **5 Section 5: formulation of questions for future research, and conclusion**

### **5.1 Formulation of questions for future research**

The following are six questions formulated from the review for future research.

#### ***5.1.1 The slower uptake of TLM in comparison to TLoD***

The literature indicates that some scholars continue to reference the TLoD model, despite it being formally superseded by the TLM. The slow adoption of TLM raises the question to be explored: Why has the newer and improved model, TLM not gained traction as rapidly as TLoD did?

#### ***5.1.2 The slower uptake of TLM in comparison to TLoD***

The four and the five lines of defence models receive little attention in academic discourse. This is surprising, as these models potentially offer stronger safeguards for credibility and risk management, while also relying on role players who are commonly present in most organizations and typically do not require significant additional resources to acquire or deploy. The second question for future research therefore is: Why organizational uptake of four lines of defence and fifth lines of defence models remains limited or slow?

#### ***5.1.3 CA's impact on discouraging management to engage in activity that can attract scrutiny from regulators***

Although numerous studies have validated the benefits of CA, particularly its role in enhancing credibility, other advantages have only been examined in isolated studies. For example, in one of the articles reviewed it was found that CA can discourage aggressive tax avoidance, and this would carry greater weight if tested across various contexts to assess if it generally promotes legal compliance and deters actions likely to attract regulatory scrutiny. A key question for future research is whether CA can deter management from participating in schemes or actions that may be seen as approaching non-compliance, potentially attracting regulatory scrutiny in general.

#### ***5.1.4 Ineffectiveness of CA in mitigating against collapse of companies***

Several researchers have observed and emphasized the global and cross-industry collapse of companies, which occurred even in organizations that claimed to implement CA. The scholars have echoed public demands for greater oversight by assurance providers to restore trust. However, the literature reviewed revealed no studies that specifically examined how CA may have failed to detect the underlying causes of these collapses or proposed ways to improve it. The key question scholars should explore is: how CA fell short in raising early warnings to help mitigate the impact of corporate failures?

#### ***5.1.5 Ineffectiveness of CA in mitigating against unethical practices by senior management and the board or corporate greed***

Furthermore, corporate failures in some cases have been attributed to unethical practices occurring at the highest organizational levels, including among board members. There has been little research directly investigating how CA might provide assurance in this context. Future studies could explore the answers to the following question: Can CA help detect or provide assurance on unethical conduct at all levels of the organization, especially among executives and those in governance roles where the risk is higher?

#### ***5.1.6 Extending assessment of CA's adoption and application in other geographical areas***

A significant number of studies rely on South African organizations and regulatory frameworks to test their research questions. This focus may lead to findings that are context-specific and not necessarily applicable in other regions. Conducting similar studies in different jurisdictions could help validate current results and contribute to the broader development and maturity of the CA concept. The researchers should address how the adoption and application of CA has evolved across different geographical regions.

Scholars can contribute in advancing CA into a more robust and adaptable governance tool, enhance its maturity level by addressing the above questions. This will further clear any ambiguities and inconsistencies that might exist in interpreting or applying CA.

## **5.2 Conclusion**

The conclusion of this review is organized and presented in line with the review questions, followed by a final concluding remark. This is to ensure that each question is addressed, and a logical flow is maintained.

### ***5.2.1 Topics covered***

Seven key themes emerged from the review, including the identification of CA's essential components and its primary stakeholders. The literature also explored how stakeholders are categorized within the lines of defence framework, how these lines are integrated into different CA models, the tools employed to enhance CA, the extent of its implementation within organizations, and the benefits it offers.

### ***5.2.2 Inconsistencies or ambiguities***

The continued citation of the outdated TLoD model instead of the updated TLM, along with divided scholarly opinion, some viewing TLM as a constructive response to TLoD's limitations, while others see it as unnecessarily complex and a regression, coupled with inconsistent evidence of its effectiveness in the banking sector, contributes to confusion about the interpretation and appreciation of CA. Furthermore, the slow adoption of TLM and lack of agreement on the role of boards and committees as line of defence highlight persistent uncertainty. The finding in one study that senior executives often resist internal audit, particularly the chief audit executive, taking a leading role in championing CA, stands in contrast to the position held by most scholars and the IIA, and serves as a source of tension and conflict.

### ***5.2.3 Knowledge gaps***

The review highlights the literature's strong focus on credibility in external reporting, with limited attention to internal reporting, suggesting a need for future research to explore internal assurance areas more deeply, a narrow focus on TLoD/TLM models, with little examination of alternative CA frameworks, and an overemphasis on the South African context are main gaps identified. Other gaps identified are lack of study on CA failures in preventing or timely detection of corporate

failures experienced in the recent past, and inadequate study on unethical conduct by senior executives and sometimes board as they are often blamed as cause of collapse.

The methodology of data collections by scholars particularly the over-reliance on manual data collection and underuse of in-depth qualitative approaches by scholars, constrain the richness and generalizability of current findings. Future research should aim to broaden the geographical scope, explore underexamined ethical and compliance dimensions, leverage advanced technologies, and adopt more rigorous data collection techniques to strengthen the maturity and global relevance of CA as a governance tool.

#### ***5.2.4 Maturity level***

The review highlights that while the field is gaining traction, particularly since 2024, it remains relatively underdeveloped and geographically concentrated, especially in South Africa. This regional dominance, while rooted in South Africa's leadership through the King III and IV frameworks, may limit broader conceptual development and global applicability.

Although the benefits of CA such as enhanced credibility and accountability are well-documented, empirical validation in diverse regulatory and cultural contexts is still lacking. Technological innovations like process mining, AI and blockchain are beginning to shape the future of CA, yet their practical integration remains at early stages.

#### ***5.2.5 Concluding remarks***

The structured literature review is one of the limited recent contributions to the field of CA and provides a thorough overview of existing CA models and their structures. This contributes to the advancement and maturation of the CA body of knowledge.

## References

- Abdelrahim, A., & Al-Malkawi, H. (2024). Examining the moderation of the role of senior management support of internal audit effectiveness: evidence from GCC region. *International journal of disclosure and governance*. <https://doi.org/10.1057/s41310-024-00264-1>
- Ackers, B. (2017) The Evolution of Corporate Social Responsibility Assurance – A Longitudinal Study. *Social and Environmental Accountability Journal*, 37(2), 97-117, <http://dx.doi.org/10.1080/0969160X.2017.1294097>
- Adebayo, A., & Ackers, B. (2023). Adoption of the combined assurance model by South African state-owned enterprises (SOEs) National Accounting Review. <https://DOI:10.3934/NAR.2023004>.
- Adebayo, A., & Ackers, B. (2024). The role of auditing in corporate governance practice in emerging economies: insights from South African state-owned enterprises (SOEs). *Meditari Accountancy Research*, 32,(7), 171-196. <https://DOI10.1108/MEDAR-11-2023-2237>
- Agarwal, R., & Kallapur S. (2018). Cognitive risk culture and advanced roles of actors in risk governance: a case study. *The journal of risk finance* 19(4), 327-342. <https://DOI10.1108/JRF-11-2017-0189>.
- Andersen, T. J., Sax, J., & Giannozzi, A. (2022). Conjoint effects of interacting strategy-making processes and lines of defense practices in strategic risk management: An empirical study. *Long Range Planning*. 55, (6). <https://doi.org/10.1016/j.lrp.2021.102164>
- Bantleon, U., d'Arcy, A., Eullerich, M., Hucke, A., Pedell, B., & Ratzinger-Sakel, N. V. V. (2021). Coordination challenges in implementing the three lines of defense model. *International Journal of Audit*, 25, 59-74. <https://DOI:10.1111/ijau.12201>

- Borgato, B., & Machini, P. L. (2021). Auditors' perceptions of integrated reporting assurance: insights from Italy. *Meditari Accountancy Research*, 29(7), 31-53. <https://DOI/10.1108/MEDAR-09-2019-0560>.
- Botes, V., Sharma, U., Botes, R., & Singh, M. (2020). A structured approach to the governance of ethics using the five lines of assurance model. *International Journal of Economics and Accounting*, 9(4), 336-352. <https://www.inderscienceonline.com/doi/pdf/10.1504/IJEA.2020.110166>
- Boujelben S., & Medhioub, N. (2024). Does the combined assurance model affect tax avoidance? The case of South African companies. *Corporate Governance: The International Journal of Business in Society*. <https://DOI10.1108/CG-08-2023-0346>.
- Brender N., Gauthier, M., Morin, J., & Salihi, A. (2023). Three lines model paradigm shift: a blockchain-based control framework. *Journal of applied accounting*, 25(1), 149-170. <https://doi/10.1108/jaar-06-2022-0143/full/pdf>.
- Cantù, E., Langella, C., & Vannini, I. E. (2024). Making sense of the internal audit function: Toward internal controls integration and organizational learning. *Financial accountability & management*, 41, 262–273. <https://onlinelibrary.wiley.com/doi/pdf/10.1111/faam.12413>
- d'Arcy, A., & Eulerich, M. (2023). Drivers for the maturity of integrated governance in organizations-An empirical investigation. *International journal of auditing*, 28, 485-499. <https://onlinelibrary-wiley-com.uplib.idm.oclc.org/doi/10.1111/ijau.12338>
- Davies, H., & Zhivitskaya, M. (2018). Three Lines of Defence: A Robust Organising Framework, or Just Lines in the Sand? *Global policy*, 34-42. <https://doi/10.1111/1758-5899.12568>
- Decaux, L., & Saren, G. (2015). Implementing combined assurance from multiple case studies. *Managerial auditing journal*, 30 (1) 56-79. <https://doi/10.1108/maj-08-2014-1074/full/html>

- DeSimone, S., Giuseppe D'Onza, G., & Sarens, G. (2021). Correlates of internal audit function involvement in sustainability audits. *Journal of management and governance*, 25, 561–591. <https://doi.org/10.1007/s10997-020-09511-3>.
- Diego-Mantecón, J. M., Blanco, T. F., Chamoso, J. M., & Ca´ceres, M. J. (2019) An attempt to identify the issues underlying the lack of consistent conceptualisations in the field of student mathematics-related beliefs. *PLoS ONE*, 14(11). <https://doi.org/10.1371/journal.pone.022469>.
- Dilla, W., Janvrin, D., Perkins, J., & Raschke, R. (2023). The influence of sustainability assurance report format and level on nonprofessional investors' judgments. *Sustainability Accounting, Management and Policy*, 14(6), 1209-1241. <https://doi/10.1108/sampj-09-2022-0473/full/html>
- Donkor, A., Djajadikerta H. G., & Roni, S. M. (2021). Impacts of combined assurance on integrated, sustainability and financial reporting qualities: Evidence from listed companies in South Africa. *International Journal of Auditing*, 25(2), 475-507. <https://onlinelibrary-wiley-com.uplib.idm.oclc.org/doi/10.1111/ijau.12229>
- Donkor, A., Trireksani, T., & Djajadikerta, H. G. (2025).The role of integrated reporting and earnings management on the combined assurance and capital market liquidity relationship. *Asian Journal of Accounting Research*, 10(2), 200-218. <https://DOI/10.1108/AJAR-08-2024-0318>.
- dos Santos, A. C., Favato, K. J., & Neumann, M. (2021). Integrated reporting and stakeholder management: a research agenda. *Revista Contabilidade & Finanças*. <https://www.scielo.br/j/rcf/a/hJwDZhcMNC3sLkqhTVjKghc/?format=html>
- Eulerich M., Huang Q., Pawlowski J., & Vasarhelyi, M. A. (2025). Using process mining as an assurance tool in the three-lines-model. *International Journal of Accounting Information Systems*, 56. <https://doi.org/10.1016/j.accinf.2025.100731>.
- Fenelon, M., Doorn, J., & Scholten, W. (2024). Crossing the lines a human approach to improving the effectiveness of the three lines model in practice. *Journal of Financial*

*Regulation and Compliance*, 32(5), 620-632. <https://doi/10.1108/jfrc-09-2023-0150/full/html>

Forte, J., & Barac, K. (2015). Combined assurance: A systematic process. *Southern African Journal of Accountability and Auditing Research*, 17(2), 71-83.

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extension://efaidnbmnnnibpcajpcgiclfendmkaj/https://repository.up.ac.za/bitstream/handle/2263/51668/Forte\_Combined\_2015.pdf?sequence=1

Giraldo, F.A.H., Muñoz M.Á.B., & Delgado-Martínez, E. (2024). Assurance Practices in Colombia's Non-Financial Sectors: Enhancing Sustainability Report Reliability. *Sustainability*, 16. <https://doi.org/10.3390/su162310371>

Grebe, G.P.M., & Marx, J. (2023). Perceived Relationship between risk culture and risk management practices in Ghanaian banks. *Journal of Riks and Financial Management*, 16, 407. <https://doi.org/10.3390/jrfm16090407>

Grassmann, M., Fuhrmann, S., & Guenther, T.W. (2022). Assurance quality, disclosed connectivity of the capitals and information asymmetry – An interaction analysis for the case of integrated reporting. *Meditari Accountancy Research*, 30(3), 852-892. <https://DOI10.1108/MEDAR-11-2020-1087>.

Gourbier, L., Lacuzzi, S., Padovani, E., & Saliterer, I. (2024). Risk management in the public Sector: A comparative analysis of central government settings in France, Germany, and Italy. *Financial Accountability & Management*, 41, 293–307. <https://onlinelibrary.wiley.com/doi/pdf/10.1111/faam.12416>

Hajji, A.A., & Anifowose, M. (2016). Audit committee and integrated reporting practice: does internal assurance matter? *Managerial Auditing Journal*, 31(8/9), 915-948. <https://DOI10.1108/MAJ-12-2015-1293>

Héroux, S., & Fortin, A. (2024). How the three lines of defense can contribute to public firms' cybersecurity effectiveness. *International Journal of Disclosure and Governance*. . <https://doi.org/10.1057/s41310-024-00226-7>.

Hoang, H., & Phang, S. (2021a). How does combined assurance affect the reliability of integrated report and investment judgement. *European Accounting Review*, 30(1), 175-195. <https://doi.org/10.1080/09638180.2020.1745659>.

Hoang, H., & Phang, S. (2021b). Does positive CSR increase willingness to invest in a company based on performance? The incremental role of combined assurance. *Accounting and Finance*, 61(4), 5631–5654. <https://doi/10.1111/acfi.12771>

Hossain, A. Bose, S., & Shamsuddin, A. (2023). Diffusion of integrated reporting, insights and potential avenues for future research. *Accounting & Finance*, 63. <https://DOI10.1111/acfi.12981>.

Institute of Directors in Southern Africa (IoDSA) (2009) King Report on Governance for South Africa 2009 (King III).  
[https://cdn.ymaws.com/www.iodsa.co.za/resource/resmgr/king\\_iii/King\\_Report\\_on\\_Governance\\_fo.pdf](https://cdn.ymaws.com/www.iodsa.co.za/resource/resmgr/king_iii/King_Report_on_Governance_fo.pdf).

Institute of Directors in Southern Africa (IoDSA) (2016) King Report on Corporate Governance for South Africa 2016 (King IV).  
[https://cdn.ymaws.com/www.iodsa.co.za/resource/collection/684B68A7-B768-465C-8214-E3A007F15A5A/IoDSA\\_King\\_IV\\_Report\\_-\\_WebVersion.pdf](https://cdn.ymaws.com/www.iodsa.co.za/resource/collection/684B68A7-B768-465C-8214-E3A007F15A5A/IoDSA_King_IV_Report_-_WebVersion.pdf)

Institute of Internal Auditors, 2013. The three lines of defense in effective risk management and control. <https://theiia.fi/wp-content/uploads/2017/01/pp-the-three-lines-of-defense-in-effective-risk-management-and-control.pdf>

Institute of Internal Auditors (IIA), 2020. The IIA's Three lines model. An update of the Three Lines of Defense. <https://www.theiia.org/globalassets/documents/resources/the-iias-three-lines-model-an-update-of-the-three-lines-of-defense-july-2020/three-lines-model-updated-english.pdf>

- Jans, M., van der Werf, J.M., Lybaert, N., & Vanhoof, N. (2011). A business process mining application for internal transaction fraud mitigation. *Expert Systems with Applications*, 38(10), 13351-13359. <https://doi.org/10.1016/j.eswa.2011.04.159>.
- Kagias, P., Garefalakis, A., Passas, I., Kyriakogkonas P., & Sariannidis, N. (2024). Whistleblowing Based on the Three Lines Model. *Administrative Sciences*. 14(5), 83. <https://www.mdpi.com/2076-3387/14/5/83>
- Kashyap, S., & Iveroth, E. (2020). Transparency and accountability influences of regulation on risk control: the case of a Swedish bank. *Journal of Management and Governance*, 25, 475–508. <https://link.springer.com/article/10.1007/s10997-020-09550-w>
- Keiser, N.L. & Payne, S.C. (2019). Are employee surveys biased? Impression management as a response bias in workplace safety constructs. *Safety Science*, 118, 453–465. <https://doi.org/10.1016/j.ssci.2019.05.051>Get rights and content
- Lim, C.Y., Woods, M., Humphrey, C, & Seow, J.L. (2016). The paradoxes of risk management in the banking sector. *The British Accounting Review* 49. <http://dx.doi.org/10.1016/j.bar.2016.09.002>.
- Luburić, R. (2017). Strengthening the three lines of defence in terms of more efficient operational risk management in central banks. *Journal of Central Banking Theory and Practice*, 1, 29-53. <http://DOI10.1515/jcbtp-2017-0003>.
- Maroun, W (2017). Assuring the integrated report: Insights and recommendations from auditors and preparers. *The British Accounting Review*, 49. 329-346. <http://dx.doi.org/10.1016/j.bar.2017.03.003>
- Maroun, W. (2022). Corporate governance other than use of external assurance for integrated report. *Corporate Governance International Review*, 1-24. <https://doi.org/10.1111/corg.12430>.

- Maroun, W., & Prinsloo, A. (2020). Drivers of Combined assurance in a sustainable development context: Evidence from integrated reports. *Business Strategy Environment*, 29, 3702-37019. <https://doi/10.1002/bse.2606>
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLOS Medicine*, 6 (7), 264–269. <https://pubmed.ncbi.nlm.nih.gov/19621072/>
- Nurdiani, W. T., (2022). Implementation of three lines of defense model across comparison: sharia banks, regional banks, rural banks, and national banks. *Journal of Tianjin University Science and Technology*, 03(55). <https://DOI10.17605/OSF.IO/YDE2T>.
- Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know? *International Business Review*, 29(4). <https://doi.org/10.1016/j.ibusrev.2020.101717>
- Popenoe, R., Langius-Eklof, A, Ewa Stenwall. E., & Jervaeu, A. (2021). A practical guide to data analysis in general literature reviews. *Nordic Journal of Nursing Research*, 41(4), 175-186. <https://DOI:10.1177/2057158521991949>.
- Ramalho, D., André Diegues Fernandes, A.D., Miguel Mira da Silva, M.M., & Pereira, R. (2024). Digital risk: a systematic multivocal literature review. *Information Security Journal: A Global Perspective*. <https://doi.org/10.1080/19393555.2024.2419920>.
- Richard, G., & Odendaal, E. (2020). Integrated reporting assurance practices- a study of South African firms. *International Journal of Disclosure and Governance*, 17, 245-256. <https://doi.org/10.1007/s10997-020-09509-x>.
- Schuett, J. (2024). Frontier AI developers need an internal audit function. *Risk Analysis*. 1–21. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/risa.17665>
- Schuett, J. (2025). Three lines of defense against risks from AI. *AI & Society* 40, 493–507. <https://doi.org/10.1007/s00146-023-01811-0>

- Seidenfuss, K., Young, A., & Datwani, M. (2023) Integrating governance, risk and compliance? A multi-method analysis of the new Three Lines Model. *SN Business Economics* (2023) 3, 184. <https://doi.org/10.1007/s43546-023-00561-x>
- Sheedy, E., & Canestrari-Soh, D.(2023). Does executive accountability enhance risk management and risk culture? *Accounting and Finance Account Finance*, 63, 4093–4124. <https://doi.org/10.1111/acfi.13087>
- Scheld, D., Paha, J., & Fandrey, N. (2016). Managing antitrust risks in the banking industry. *European Competition Journal*. <https://doi.org/10.1080/17441056.2016.1251191>.
- Slapničar, S., Axelsen M., Bongiovanni I., & Stockdale, D. (2025). A pathway model to five lines of accountability in cybersecurity governance. *International Journal of Accounting Information Systems*, 51. <https://doi.org/10.1016/j.accinf.2023.100642>
- Soh, D.S.B & Martinov-Bennie, N.(2015) Internal auditors' perceptions of their role in environmental, social and governance assurance and consulting. *Managerial Auditing Journal*, 30(1), 80-111. <https://DOI10.1108/MAJ-08-2014-1075>.
- Tawfik, O. I., Durrah, O., & Aljawhar, K. A. (2023). The Role of the internal auditor in strengthening the governance of economic organizations using the three Lines of defense model. *Journal of Risk and Financial Management*, 16(7), 341. <https://doi.org/10.3390/jrfm16070341>.
- Theofanidis, D., & Fountouk, A. (2018). Limitations and delimitations in the research process. *Perioperative nursing* , 7(3). [https://www.spnj.gr/articlefiles/volume7\\_issue3/pn\\_sep\\_73\\_155\\_162b.pdf](https://www.spnj.gr/articlefiles/volume7_issue3/pn_sep_73_155_162b.pdf)
- Turner, D. (2022). Three lines of defence-Is it the right model? *Journal of Financial Compliance*, 5(3), 237-247. [https://www.henrystewartpublications.com/sites/default/files/JFC5.3Threelinesofdefensei\\_sittherightmodel.pdf](https://www.henrystewartpublications.com/sites/default/files/JFC5.3Threelinesofdefensei_sittherightmodel.pdf)

- Westhausen, H. (2017). The escalating relevance of internal auditing as anti-fraud control. *Journal of Financial Crime*, 24(2), 322-328. <https://DOI10.1108/JFC-06-2016-0041>.
- van Dinter, R., Tekinerdogan, B., & Catal, C. (2021). Automation of systematic literature reviews: A systematic literature review. *Information and Software Technology* 136. <https://doi.org/10.1016/j.infsof.2021.106589>.
- Valkenburg, B., & Bongiovanni, I. (2024). Unravelling the three lines model in cybersecurity: A systematic literature review. *Computers and Security*, 139. <https://doi.org/10.1016/j.cose.2024.103708>.
- Vousinas, G. L. (2021). Beyond the three lines of defense: The five lines of defense model for financial institutions. *Journal of Finance and Risk Perspectives*, 10, 95-110. <chrome-extension://efaidnbmninnibpcjpcglclefindmkaj/https://www.acrn-journals.eu/resources/jofrp10f.pdf>
- Vuko, T., Slapničar, S., Cular, M., & Drašček, M. (2024). Key drivers of cybersecurity audit effectiveness: A neo-institutional perspective. *International Journal of Auditing*, 29, 188–206. <https://doi/epdf/10.1111/ijau.12365>.
- Yan, M., Jia, F., Chen, L., & Yan, F. (2022). Assurance process for sustainability reporting: Towards a conceptual framework, *Journal of Cleaner Production*, 377. <https://doi.org/10.1016/j.jclepro.2022.134156>.

Annexure A: Distribution by method of collection of data

No	Article	Interviews	Surveys/ questionnaire	Secondary data collection/ content analysis	Literature review/reference	Experiment	Case study/ observation	Document analysis
1	Abdelrahim & Al-Malkawi, (2024)		X					
2	Adebayo & Ackers, (2024).			X				X
3	Agarwal, & Kallapur, (2018)	X		X				X
4	Andersen et al., (2022)		X	X				
5	Bantleon et al., (2020)		X					
6	Borgato & Marchini 2021	X						
7	Botes et al., (2020).				X			
8	Boujelben & Medhioub, (2024).			X				
9	Brender, et al., (2023).	X						
10	Cantù, et al. (2024).						X	
11	d'Arcy & Eulerich, (2023).		X					
12	Davies, & Zhivitskaya, (2018)				X			
13	Decaux & Sarens, (2015)	X						
14	DeSimone, et al. (2021)				X			
15	Donkor & Tirekeksani, (2024)			X				
16	Donkor, et al., (2021).			X				
17	Eurlerich, (2025)			X				
18	Gourbier et al., (2024).			X				
19	Giraldo et al., 2024)			X				
20	Grassmann et al., (2022)			X				
21	Grebe & Marx (2023)	X						
22	Haiji & Anfowose, (2016)			X				
23	Héroux & Fortin, (2024).					X		
24	Hoang, & Phang (2021a).					X		
25	Hoang & Phang, (2021b).	X						
26	Hossain et al., (2023)				X			
27	Kagias et al., (2024).				X			
28	Kashyap & Iveroth, (2020).	X					X	
29	Lim, et al. (2016)	X						
30	Luburić, (2017)				X			
31	Maroun, 2017	X						
32	Maroun, (2020).			X				
33	Maroon & Prinsloo, (2020).			X				
34	Soh & Martinov-Bennie, (2015).	X						

No	Article	Interviews	Surveys/ questionnaire	Secondary data collection/ content analysis	Literature review/reference	Experiment	Case study/ observation	Document analysis
35	Prinsloo & Maroun, (2021).			X				
36	Ramalho, (2024)				X			
37	Richard & Odendaal, (2020).	X		X				X
38	Scheld et al., (2016)				X			
39	Schuett, (2024).				X			
40	Schuett, 2025				X			
41	Seidenfus, (2023)				X			
42	Sheedy & Canestrari-Soh (2023)				X			
43	Slapničar et al., (2023).	X						
44	Tawfik et al., (2023).		X					
45	Valkenburg & Bongiovanni, (2024).				X			
46	Vuko et al., (2023).		X					
47	Westhausen (2017)			X				
48	Nurdiani, (2022).			X				
49	Yan et al., (2023).				X			
50	Zhou et al., (2019)			X				
	<b>Total</b>	<b>12</b>	<b>6</b>	<b>17</b>	<b>14</b>	<b>2</b>	<b>2</b>	<b>3</b>