

The Impact of Forensic Accounting: A Tool for Fraud Detection and Prevention in the Public Sector in Malawi

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Abstract

The increasing prevalence of fraud and technical errors in the public sector has underscored the importance of forensic accounting for enhancing financial accountability and transparency. This study investigates the role of forensic accounting in fraud detection, prevention, and litigation support within Malawi's public institutions. With growing concerns over financial mismanagement and its impact on national debt and public service delivery, the demand for forensic accountants is becoming more critical. To assess the effect of forensic accounting practices, a structured Google Form questionnaire was distributed to 85 purposively sampled respondents, comprising internal auditors from the Central Internal Audit Unit (CIAU), external auditors from the National Audit Office (NAO), and accountants from various government ministries and departments. Quantitative data analysis was performed using Independent Sample T-Test, One-way ANOVA, Mann-Whitney U Test, and Kruskal-Wallis H Test. The results revealed that forensic accounting techniques significantly aid in preventing and detecting fraud in the public sector. Respondents also affirmed that forensic accounting skills enhance the effectiveness of fraud investigations. Furthermore, a strong positive relationship was observed between forensic expert witnessing and the provision of credible litigation support within Malawi's legal system. The study concludes that integrating forensic accounting into public financial management is vital for improving financial integrity, transparency, and accountability. It recommends capacity building in forensic accounting and greater institutional support to maximize its potential benefits in the Malawi public sector.

Keywords: Anti-Fraud Measures, Financial Mismanagement, Forensic Accounting, Fraud Detection, Fraud Prevention, Litigation Support.

Introduction

Fraudulent and financial crimes are on the rise globally. The increase in such economic and white-collar crimes has posed a threat to the business (1). Therefore, the need for forensic accounting in the era of increased financial scandals is inevitable for every business. Financial fraud is becoming an emerging economic threat globally, requiring the skills and expertise of forensic accountants (2). Financial information manipulation is a topic that has been looked into critically in the economic environment. Business transactions have become more complex because of business growth and technology, and how financial crimes are committed has changed over time (3). Previous corporate frauds have demonstrated that financial information manipulation significantly erodes the public trust in firms' financial statements (4). Due to the global breakdown caused by the financial scandals of Enron, WorldCom and Parmalat,

forensic accountants and auditors need to strengthen systems and controls for identifying, preventing and dealing with fraud, which has increased (5). Despite internal and external auditors conducting checks and balances, fewer detections and fraud prevention incidents have been observed due to a lack of forensic accounting skills, an emerging field of forensic science and accounting (6). The field of Forensic accounting is very diverse. Its scope includes Data analytics, forensic science, Financial Expertise and legal and litigation support as an expert witness in forensic accounting. Therefore, forensic accountants require vast knowledge, skill and expertise to detect and prevent fraudulent activities in the public sector and organisations (7). It might be evident that a lack of the required skill and expertise in fraud investigations by the external and internal auditors might have contributed to

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(Received 22nd June 2025; Accepted 02nd October 2025; Published 30th October 2025)

the failure to detect, prevent, and combat fraud and corruption (8). Public sector corruption is particularly rampant in many developing countries, and Malawi is no exception. The Malawian context is characterized by several distinctive challenges, including inadequate institutional structures to combat sophisticated financial crimes, a lack of resources for advanced training and technology, and the systematic nature of fraud within Ministries, Departments, and Agencies (MDAs). This situation is exacerbated by a perceived failure of the rule of law, where many arrests do not lead to convictions due to a lack of substantive evidence from expert witnesses. This study contributes to the current body of knowledge by providing empirical evidence on the perceived effectiveness of forensic accounting as a targeted solution within this specific, challenging environment. While studies have explored this issue in other Sub-Saharan nations like Nigeria, this research offers a focused analysis of the Malawian public sector.

Despite the presence of internal and external auditors, fraud detection and prevention have been limited, often due to a lack of forensic accounting skills. Forensic accounting is a diverse field that integrates data analytics, financial expertise, and legal support, requiring a unique skill set to uncover fraudulent activities. This study examines the role of specific forensic accounting procedures—including digital forensics, asset tracing, and expert witnessing—as crucial tools for strengthening governance in Malawi.

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The organized nature of frauds in public sectors has become systematic and multi-dimensional such that the need to strengthen forensic Accountants is of paramount importance, as the public sector auditors may not have the essential skills and knowledge required in detecting, preventing or reducing fraud in Malawi Public Sector Ministries, Departments and Agencies (MDAs) (9). Despite the government's efforts to fight fraud and corruption, with many arrests being made in the Malawi public sector, the rule of law has failed to take its course due to a lack of expert witnesses' substantive evidence to support the litigations against the perpetrators of fraud and corruption (10).

Despite the presence of internal and external auditors, fraud detection and prevention have been limited, often due to a lack of forensic accounting skills. The complex and systematic nature of fraud within Malawi's public sector necessitates a greater reliance on forensic accountants. This is because traditional public auditors in Ministries, Departments, and Agencies (MDAs) often lack the specialized expertise required to effectively detect, prevent, and reduce such intricate schemes. This study examines the role of specific forensic accounting procedures—including digital forensics, asset tracing, and expert witnessing—as crucial tools for strengthening governance in Malawi.

The manipulation of financial information has emerged as a critical concern in today's economic environment. With the expansion of business operations and the evolution of technology, monetary transactions have become more complex, creating new avenues for financial crimes

(11). The increasing sophistication of these crimes poses significant threats to the integrity of financial reporting and investor trust. Fraudulent practices are a significant barrier to national development, particularly in Nigeria (12). Their research emphasises that integrating forensic accounting and anti-corruption measures plays a pivotal role in identifying and mitigating fraudulent activities. Moreover, the early involvement of forensic accountants during audit planning stages significantly enhances fraud detection outcomes (13).

The theoretical grounding of this study is supported by four key frameworks. First, Agency Theory provides a foundational context for the public sector. In this view, government officials (agents) are tasked with managing public resources on behalf of citizens (principals). An agency problem is what happens when officials make decisions that benefit themselves personally, instead of serving the public they are supposed to represent. Forensic accounting serves as a critical monitoring mechanism to reduce this information asymmetry and hold agents accountable, thereby minimizing the potential for fraudulent behavior.

As defined by the law, financial crime includes any dishonest or deceptive activity conducted for personal or organisational gain. It spans various illegal acts such as money laundering, fraud, terrorist financing, tax evasion, embezzlement, forgery, and identity theft (14). These crimes are not limited to the private sector; public institutions are equally affected through bribery and corruption (15). Trace the etymology of the term “corruption” to the Greek word *corruptus*, which implies deviation from official responsibilities driven by personal gain. Corruption manifests through bribery, favouritism, embezzlement, and electoral malpractice. A significant challenge in addressing fraud lies in its covert and complex nature, often involving top-level executives and occurring during times of financial instability or impending bankruptcy (16).

The discipline of forensic accounting has become increasingly important in uncovering and preventing such financial irregularities. Forensic accountants provide essential litigation support by quantifying economic losses, investigating financial discrepancies, and presenting expert testimony in court (17). Their scope includes evaluating asset misappropriation, employee theft,

and complex white-collar crimes. These professionals employ a unique blend of accounting, auditing, and investigative skills to detect fraud and enhance transparency and accountability within organizations (18).

The theoretical grounding of this study is supported by three key frameworks: the White-Collar Crime Theory, the Mindset and Problem Representation Theory, and the Fraud Diamond Theory. Edwin Sutherland’s White-Collar Crime Theory, introduced in 1939, posits that individuals of high social and professional status commit crimes in the course of their occupation. Sutherland contended that while white-collar criminals exhibit behavioural patterns similar to traditional offenders, they benefit from social perceptions that make their actions appear less criminal (19). explain that white-collar crimes such as insider trading, tax fraud, and intellectual property theft often remain undetected due to the complexity of financial systems and the offenders’ privileged positions. This theory underscores the need for specialised expertise to address crimes that are deeply embedded within legitimate organisational processes (20).

Complementing this view is the Mindset and Problem Representation Theory, which explores the cognitive orientation of individuals involved in fraud detection (21). As noted by a forensic accountant’s mindset—characterised by scepticism, persistence, and detail orientation—significantly influences how they perceive and investigate financial anomalies (22). The mindset shapes how problems are represented, prioritized, and solved, which ultimately affects the outcome of fraud investigations. Research indicates that a more investigative mindset correlates with higher detection accuracy and improved analytical judgment. This theory highlights the psychological dimensions of fraud detection and the importance of training forensic accountants to think critically and independently (23).

This theory argues that fraud is most likely to occur when four elements converge—pressure, opportunity, rationalization, and capability (24). While the original triangle emphasised the motivations behind fraud, FDT introduces the idea that capability, such as intelligence, confidence, and authority, enables an individual to commit and conceal fraudulent acts (25). Explain that individuals in senior management roles often

possess the capability to override controls and exploit weaknesses in the system. This theory is especially pertinent to the public sector, where weak internal controls and hierarchical structures may foster fraud. The FDT provides a

comprehensive framework for understanding the dynamics of fraud and informs the strategic role of forensic accountants in identifying and addressing these risks (26).

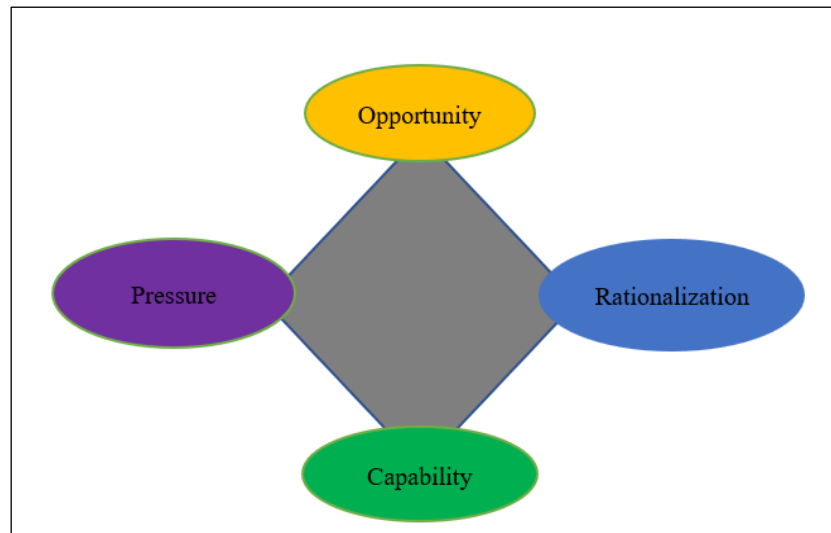


Figure 1: Fraud Diamond Theory (27)

The Fraud Diamond Theory is an adapted version of the classic Fraud Triangle, as shown in Figure 1. The theory recognizes four elements for fraudulent activity: Pressure, Opportunity, Rationalization, and Capability. Pressure, Opportunity, and Rationalization are elements in the original theory, and Capability is the important fourth component. Capability essentially indicates that one has the skills and knowledge and is in a position to not only

commit fraud but also to cover it up successfully. If any of the four elements are absent, fraud may not be possible. Therefore, any fraud deterrent strategy should be developed in the four areas of Pressure, Opportunity, Rationalization, and Capability by removing pressure, closing opportunities, disputing rationalizations, and taking away capabilities.

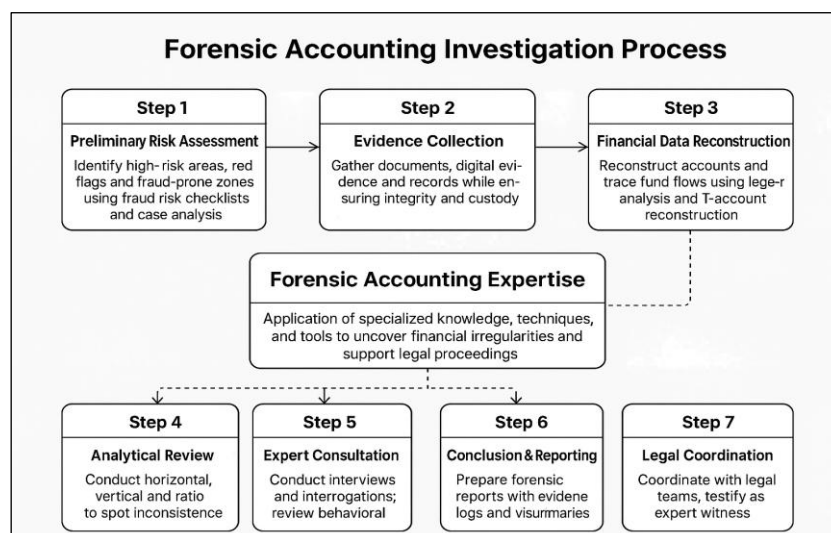


Figure 2: Conceptual Framework

Building upon these theoretical foundations, the conceptual framework adopted in this study outlines the sequential process of a forensic

accounting investigation (Figure 2). The process begins with a preliminary risk assessment, which involves situational analysis and the use of fraud

risk checklists to detect red flags and identify high-risk areas. This diagnostic phase helps forensic professionals prioritise their focus and allocate investigative resources effectively (28).

Once high-risk areas are identified, the next step is evidence collection, wherein all relevant documentary, digital, and transactional data are gathered following strict chain-of-custody protocols to ensure admissibility in legal proceedings. Following evidence collection, forensic accountants engage in financial data reconstruction. Techniques such as ledger scrutiny and T-account reconstruction help trace the flow of funds and reconstruct transactions to detect any irregularities or signs of misappropriation (29). The application of forensic expertise becomes critical at this stage, as professionals interpret the data using specialized tools and frameworks within a legal context.

Subsequently, an analytical review is conducted through horizontal, vertical, and ratio analysis. These methods identify inconsistencies and financial anomalies that point toward potential fraud. To enhance the robustness of the investigation, expert consultation is employed, involving interviews, behavioural analysis, and triangulation of data with human testimonies. This multidisciplinary approach reinforces the credibility of the findings (30).

Finally, all evidence and analysis are consolidated into a forensic report that presents the findings in a structured and legally sound manner. The report includes visual summaries, data logs, and explanatory narratives suitable for internal audits and judicial proceedings (31). The final stage involves legal coordination, wherein forensic accountants collaborate with legal professionals to present their findings in court, often serving as expert witnesses. In this structured investigative framework, forensic accounting not only uncovers fraudulent activities but also supports judicial processes and strengthens institutional governance mechanisms (32).

Methodology

This section outlines the methods used to carry out the study. The key objective of this study is to analyze the role of forensic accounting in detection and prevention of frauds in Malawi's public sector. This study was guided by an inquiry into the extent to which forensic accounting skills influence fraud

prevention, the effectiveness of its techniques in fraud detection, and the significance of its relationship with litigation support services in Malawian courts.

Research Design

The fundamental purpose of a research design is to establish a framework that guarantees the collected data will address the research problem with maximum clarity and efficacy. Within the social sciences, this process necessitates a precise specification of the evidence required to substantiate a theory, appraise an intervention, or accurately characterize a given phenomenon (33). The descriptive research design uses a variety of qualitative and quantitative research techniques to gather information that helps to precisely describe a research problem. Unlike experimental research, where the researcher controls and manipulates every variable, descriptive research does not (34). Instead, only the variables are discovered, observed, and measured. The two methods that are most frequently employed to carry out this study design are surveys and observation. A survey approach was adopted to conduct this research.

Target Population

The research was conducted in Malawi. The target population for this study is made up of a total number of sixty [60] internal Auditors, fifty (25) Public External auditors at the National Audit Office (NAO) and 25 Accountants for 28 councils and ministries, totalling 110 respondents.

Sample Size and Sampling Procedure

One hundred and ten [110] respondents were selected using a purposive sampling technique because it was suitable for this study due to the fact that the selected participants' opinions were relevant and able to provide answers to the research questions.

Data Collection

This study used primary sources of data. The primary data was obtained with the help of a research-structured, self-administered Google form questionnaire distributed through email to the respondents in the various Ministries and departments throughout the Malawi Public Service.

Data validation

The questionnaire used in the study consisted of 20 closed-ended questions designed on a 5-point Likert scale ranging from "strongly agree" to

"strongly disagree," with no open-ended questions included. The questions were presented in random order and not explicitly aligned with the three hypothesised constructs—Forensic Accounting Techniques, Forensic Accountant Skills, and Litigation Services—though the researcher ensured a logical arrangement to facilitate analysis. To establish content validity, the questionnaire was reviewed and validated by five experts in forensic accounting—three from Malawi and two from India—bringing diverse professional insights to the instrument's development. However, the study provides limited details on the validation process, such as the specific criteria used by the experts, measures of inter-rater reliability, or pilot testing results. Including these methodological details would enhance the rigour, transparency, and reliability of the questionnaire for data collection.

Response Rate

While the study achieved an excellent response rate of 77%, it is essential to address the potential

for non-response bias, which may impact the validity and generalizability of the findings. Non-response bias occurs when the views or characteristics of those who did not respond differ systematically from those who did, potentially skewing the results. In this case, 23% of the targeted respondents did not participate in the survey, and there is no indication of follow-up efforts or analysis to determine whether their absence introduced any bias. For instance, if the non-respondents were disproportionately external auditors or academicians with different perspectives on forensic accounting, their exclusion could result in an unbalanced representation of opinions. The lack of demographic or professional profiling of the non-respondents limits the ability to assess this risk. To strengthen the reliability of the findings, future studies should incorporate strategies to evaluate and mitigate non-response bias, such as comparing early and late responders or collecting limited data on non-respondents for comparative analysis.

Survey Response Analysis

Table 1: Response Rate Summary

Response Category	Percentage (%)
Response Rate	77
Non-Response Rate	23
Total	100

Note: N = 85 (total sample size)

Results and Discussion

To analyse the gathered data, the researcher employed measures of central tendency. The process of giving collected data structure, order, and meaning is known as data analysis. Applying statistical approaches, producing summaries, finding trends, and condensing a large amount of accumulated data into a manageable amount are all part of data analysis. The Statistical Package for Social Sciences (SPSS) version 20 was used to analyse the data because the study was quantitative. Descriptive and inferential statistics were employed in the study. Descriptive statistics included proportions, frequencies, averages, and measures of central tendency (mean). On the other hand, the association between the variables was ascertained using inferential statistics. Forensic accounting Technique, Forensic Accountant skills and litigation support services knowledge were all independent variables in the study.

Analysis of Variance (ANOVA), Independent Sample T Test, Mann-Whitney U Test and Kruskal-Wallis H test was used to carefully assess the information gathered from the Google Form. Independent Sample T Test and ANOVA were used on Data that was normally distributed after testing normality of the data, while the Mann-Whitney U Test and the Kruskal-Wallis H test were used on data that was not normally distributed. The selected statistical tests were used to determine the proportion of variance in the dependent variables attributable to the independent variables. For these tests, the null hypothesis was rejected if the calculated F-statistic exceeded the predetermined critical F-value.

Gender of Respondents

The objective of this study is to investigate the impact of respondent age on fraud detection and prevention in Malawi's government sector. The results are shown in Figure 3 below.

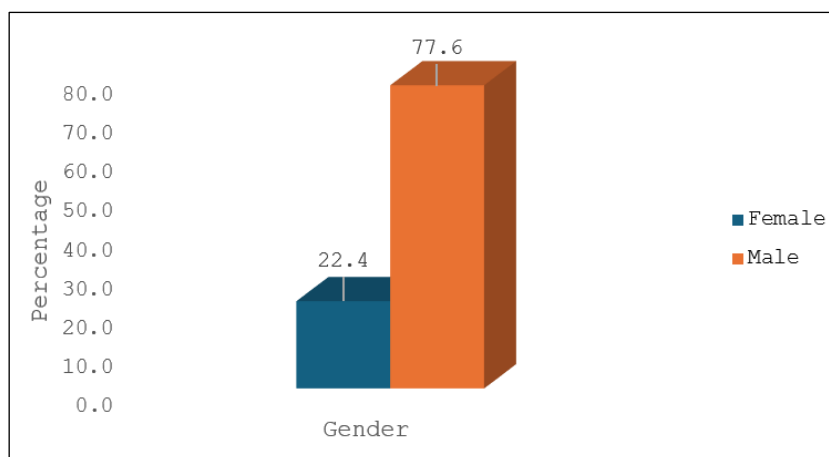


Figure 3: Gender of Respondents

Figure 3 presents a demographic overview of the study's participants, illustrating the gender distribution among the respondents from Malawi's public sector. The data reveals a notable disparity in representation: Male officers constitute the majority of the sample, accounting for 77.6% of the total respondents. In contrast, female officers represent 22.4% of the participants. This distribution indicates that the findings and perspectives gathered in this study are predominantly reflective of the views held by male personnel within the surveyed public sector

entities. Understanding this demographic makeup is crucial when interpreting the subsequent results regarding the impact of forensic accounting, as gender-based differences in experience, perception, or roles within the public sector could potentially influence the findings.

Age of Respondents

The findings are depicted in Figure 4 below, which represents the age of the respondents and mainly fall between 40 and 50 years old.

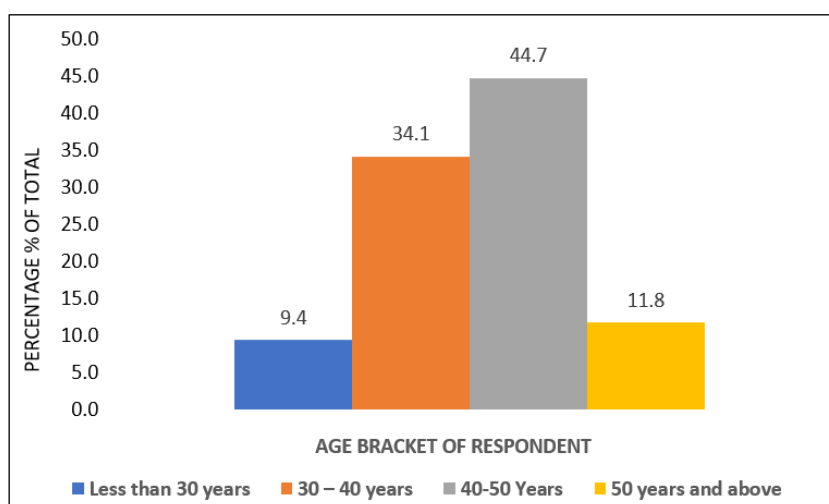


Figure 4: Age of Respondents

Figure 4 shows that the largest group of respondents were between 40 and 50 years old. This age bracket accounted for 44.7% of all participants in the study. The second largest group, representing 34.1%, falls within the 30-40 years range. Respondents aged above 50 years constitute 11.8% of the sample, while the youngest group, below 30 years, makes up 9.4%. This distribution indicates that the majority of the

study's participants are experienced professionals, predominantly in their middle careers (30-50 years). This age profile is significant as it suggests that the perspectives gathered largely come from individuals who have likely spent a considerable amount of time in the public sector and may have a deeper understanding of existing systems, vulnerabilities to fraud, and the potential role of forensic accounting.

Academic Attainment of Respondents

The study evaluated how forensic accounting helps prevent fraud in Malawi's public sector. To do this,

it looked at the academic qualifications of the respondents, with the findings presented in Figure 5.

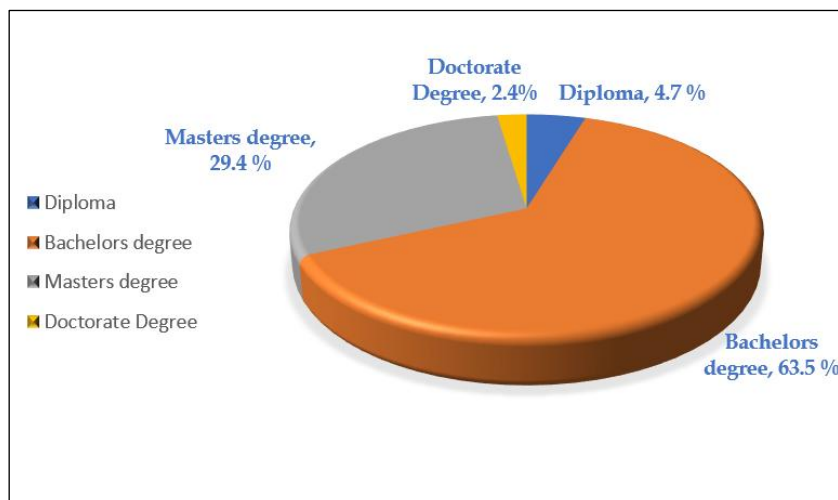


Figure 5: Academic Attainment of Respondents

Figure 5 illustrates the academic attainment levels among the respondents from Malawi's public sector who participated in this study. The findings indicate a highly educated sample, with the largest proportion of respondents, 63.5%, holding a bachelor's degree as their highest qualification. A substantial number also possess a master's degree, accounting for 29.4% of the respondents. Those with a diploma represent 4.7%, while a small percentage, 2.4%, have attained a doctorate degree. This distribution highlights that the majority of the participants have attained tertiary education, suggesting a strong academic

foundation that is likely relevant to their professional roles within the public sector and potentially influences their understanding and perspectives on specialized areas like forensic accounting.

Professional Qualification of Respondents

The study aimed to evaluate the impact of forensic accounting on fraud in Malawi's public sector. To support this, it gathered data on the respondents' professional qualifications, as presented in Table 2.

Professional Qualification Distribution Analysis

Table 2: Distribution of Respondents by Professional Qualification

Professional Qualification	Percentage (%)
ACCA	18.8
CIA	7.1
CFE	1.2
CISA	1.2
Others	71.8
Total	100.0

Note: N = 85 (total sample size)

Table 2 presents the professional qualifications held by the study's respondents from Malawi's public sector, offering insight into their

professional backgrounds (N=85). The data indicates that the largest proportion of respondents, 71.8% (61 individuals), possess

'Other' professional qualifications, suggesting a wide variety of professional expertise beyond the specific certifications listed. Among the more specific qualifications relevant to the study, 18.8% (16 respondents) hold the Association of Chartered Certified Accountants (ACCA) qualification, while 7.1% (6 respondents) are Certified Internal Auditors (CIA). A smaller percentage, 1.2% (one respondent each), hold the Certified Fraud Examiner (CFE) and Certified Information Systems Auditor (CISA) qualifications. The presence of respondents with these specific accounting, auditing, and fraud-related certifications is particularly valuable, as they likely bring direct expertise and informed perspectives on the practical application and impact of forensic accounting in the public sector, complementing the views from individuals with other diverse professional backgrounds.

Inferential Statistics

To prepare for inferential analysis concerning the effect of techniques (Ho1: Forensic Techniques has no significant impact on fraud detection in the Malawi public service), it was necessary to determine if the data distribution was normal, which guides the choice between parametric and distribution free tests.

The normality of the data for Section A (Forensic Accounting Techniques) was assessed using standard statistical tests, as shown in Table 1. Specifically, the Shapiro-Wilk test was employed, which is well-suited for the sample size of 85. The hypothesis for this test was framed as:

Null Hypothesis (for Normality): The data distribution is normal (Parametric Test appropriate).

Alternative Hypothesis (for Normality): The data distribution is not normal (Non-Parametric Test appropriate).

Table 3: Test of Normality Question 1-10

Variable	Test	Statistic	df	Sig.	Note
Forensic Accounting Techniques	Kolmogorov-Smirnov (Lilliefors)	0.071	85	0.200*	*Lower bound of true significance
	Shapiro-Wilk	0.978	85	0.145	

Table 3 shows the statistical outcome indicates that the data for Forensic Accounting Techniques in Section A is approximately normally distributed. Based on this finding of normality, the researcher determined that parametric tests were appropriate for analysing this section of the data. Consequently, the Independent Sample T-Test was selected to test relevant inferential statistics and hypotheses pertaining to Forensic Accounting Techniques in Section A. It is crucial to distinguish this test of data distribution normality from the study's primary research hypotheses about the effect of forensic accounting techniques, which are tested using appropriate methods selected after assessing data characteristics. Figure 6 provides a visual representation of the data distribution for the Forensic Accounting Techniques section (Section A, Questions 1-10) through a histogram. This histogram displays the frequency of different scores assigned by respondents regarding these techniques. Overlaid on the bars of the histogram is a normal distribution curve. The extent to which

the histogram's shape conforms to this curve visually supports the findings from the statistical normality tests presented in Table 1. As observed in Figure 2, the distribution of the data points generally clusters around the centre and tapers off towards the tails, approximating the bell shape of the normal curve. This visual assessment aligns with the statistical conclusion drawn from the Shapiro-Wilk test ($p = 0.145$ in Table 1), which indicated that the data is normally distributed. The histogram also provides descriptive statistics for this data set: the Mean score is 1.95, with a Standard Deviation of 0.377, based on a sample size (N) of 85. The visual evidence from this histogram, in conjunction with the statistical test results, reinforces the determination that the data for Forensic Accounting Techniques meets the assumption of normality. This confirmation is essential as it justifies the use of parametric inferential tests, such as the Independent Sample T-Test and One-Way ANOVA, for subsequent hypothesis testing related to this variable.

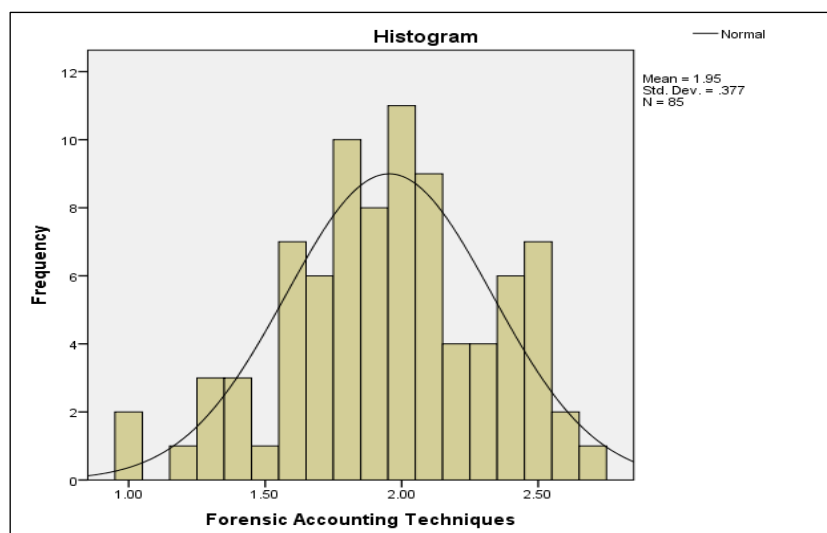


Figure 6: Normality Distribution Histogram

Hypothesis Formulation

The study's research hypothesis concerning the effect of forensic accounting techniques on fraud detection in the Malawi public service was specifically examined in relation to gender. For this analysis, the following statistical hypotheses were formulated for an Independent Samples T-Test:

Null Hypothesis (H0): Gender has no significant effect on a respondent's perception of how well forensic accounting techniques detect fraud.

Alternative Hypothesis (H1): Gender has a significant effect on a respondent's perception of how well forensic accounting techniques detect fraud.

Table 4: Independent Samples Test

Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower Upper
Forensic Accounting Techniques	Equal variances assumed	1.139	.289	1.655	83	.102	.16077	.09712	-.03240 .35393
	Equal variances not assumed.			1.903	36.972	.065	.16077	.08448	-.01041 .33194

An Independent Samples T-Test was conducted to compare the mean perceptions of male and female respondents regarding the effect of forensic accounting techniques on fraud detection. Before the T-test, Levene's Test for Equality of Variances was performed, yielding a p-value of 0.289 (Table

4). The Independent Samples T-Test results (Table 4) show a t-statistic of 1.655 with 83 degrees of freedom and a two-tailed significance value (p-value) of 0.102. Since this p-value (0.102) is greater than the chosen significance level of 0.05, we fail to reject the null hypothesis.

Table 5: Group Statistics Question 1-10

Group Statistics		Gender	N	Mean	Std. Deviation	Std. Error Mean
Forensic Accounting Techniques		Female	19	2.0789	.30291	.06949
		Male	66	1.9182	.39023	.04803

Table 5 presents descriptive statistics for the perceived effect of Forensic Accounting Techniques, separated by gender (Female N=19, Male N=66). On the Likert scale used, lower mean scores indicate greater agreement. Female respondents had a mean score of 2.0789 (SD = 0.30291), while male respondents had a mean score of 1.9182 (SD = 0.39023). Although the male respondents' mean score was numerically lower, indicating slightly stronger agreement in this sample, the Independent Samples T-Test (Table 4) found that this observed difference between genders was not statistically significant at the 0.05 level.

Hypothesis Formulation for One-Way ANOVA

To investigate the study's research hypothesis regarding the effect of forensic accounting techniques on detecting fraud, specifically in relation to the designation of respondents in the Malawi public service, a One-Way ANOVA was

planned. The statistical hypotheses for this ANOVA test are:

Null Hypothesis (H0): There is no significant variation in the perceived effectiveness of forensic accounting techniques among respondents from different professional designations.

Alternative Hypothesis (H1): There is a significant difference in the perceived effect of forensic accounting techniques among at least one of the respondent designation groups.

A key assumption for conducting a One-Way ANOVA is the homogeneity of variances, meaning that the variance within each group (designation) should be approximately equal. This assumption was tested using Levene's Test. The hypotheses for Levene's Test are:

Null Hypothesis (H0): All variances among the design groups are equal.

Alternative Hypothesis (H1): At least one of the variances among the designation groups is not equal.

Table 6: Test of Homogeneity of Variances

Forensic Accounting Techniques			
Levene Statistic	df1	df2	Sig.
1.566	2	82	.215

Table 6 presents the results of Levene's Test for assessing the homogeneity of variances for the Forensic Accounting Techniques data across the different respondent designations. The test yielded a Levene Statistic of 1.566, with degrees of freedom df1 = two and df2 = 82. The significance value (Sig.) for this test is 0.215. Using a significance level of 0.05, since the p-value (0.215) is greater than 0.05, we fail to reject the null

hypothesis of Levene's Test. This indicates that the assumption of homogeneity of variances is met; the variances in the perceived effect of forensic accounting techniques are statistically similar across the different respondent designations. Concluding that the variances are equal confirms that it is appropriate to proceed with the One-Way ANOVA to test the hypothesis regarding differences in means across design groups.

Table 7: One-way ANOVA

One-way ANOVA					
Forensic Accounting Techniques					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.208	2	.104	.728	.486
Within Groups	11.723	82	.143		
Total	11.931	84			

Following the confirmation of data normality and homogeneity of variances, a One-Way ANOVA was conducted to test the hypothesis that there is no significant difference in the perceived effect of forensic accounting techniques across different respondent designations. Table 7 presents the results of this analysis. The ANOVA yielded an F-statistic of 0.728 with 2 degrees of freedom for the Between Groups variance and 82 degrees of freedom for the Within Groups variance. The significance value (p-value) associated with this F-statistic is 0.486. Using a significance level of 0.05, since the p-value (0.486) is greater than 0.05, we

fail to reject the null hypothesis. The results indicated that there is no significant difference between the perception of forensic accounting techniques on detecting frauds in Malawi. A respondent's professional designation does not seem to be a factor in their view on the effectiveness of forensic accounting for fraud detection. This finding, suggesting a consistent view across designations, provides specific context to broader arguments, such as those that generally posit a vital role for forensic accounting techniques in detecting fraudulent transactions in public institutions.

Table 8: Tukey B Test

Forensic Accounting Techniques		
Tukey B		
Which is your area of profession	N	Subset for alpha = 0.05
		1
External Auditor	12	1.8333
Accountants	21	1.9619
Internal Auditor	52	1.9788
Means for groups in homogeneous subsets are displayed.		
a. Uses Harmonic Mean Sample Size = 19.976.		
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.		

The document then introduces Research Hypothesis 2 (Ho. 2), shifting the focus to the perceived effect of Forensic accounting skills on fraud prevention in Malawi's public sector. To appropriately analyze this new hypothesis, the first necessary statistical step is to assess the normality of the data specifically for the variable measuring "Forensic accounting skills" (presumably based on questions 11-21). The hypotheses presented for this crucial preliminary test are:

Null Hypothesis (for Normality): The data distribution for Forensic accounting skills is normal (Parametric Test appropriate).

Alternative Hypothesis (for Normality): The data distribution for Forensic accounting skills is not normal (Non-Parametric Test appropriate).

The results of this normality test will then determine whether parametric or non-parametric methods should be used to evaluate Research Hypothesis 2 itself.

Table 9: Tests of Normality Question 11-21

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Forensic Accounting skills	.133	85	.001	.888	85	.000
a. Lilliefors Significance Correction						

Table 9 presents the essential normality test results for the Forensic Accounting Skills data (Q11-21), a critical prerequisite for selecting appropriate inferential tests for Research Hypothesis 2. The Shapiro-Wilk test, chosen as ideal for this sample size (N=85), yielded a highly

significant p-value of 0.000. Since this p-value is definitely less than the 0.05 significance level, the null hypothesis of data normality is strongly rejected. This robust finding conclusively demonstrates that the Forensic Accounting Skills data distribution is not normal, thereby mandating

the use of non-parametric statistical methods, leading the researcher to appropriately select the

Mann Whitney U Test for subsequent inferential analysis.

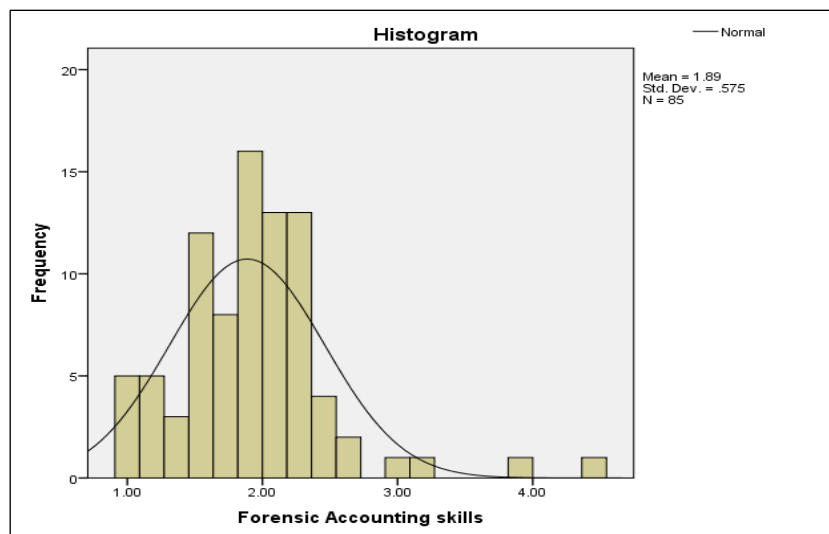


Figure 7: Normality Histogram Question 11-21

Figure 7 presents the histogram illustrating the frequency distribution of respondent scores for Forensic Accounting Skills (Section B, Questions 11-21). This visual representation allows for an assessment of the data's shape compared to an ideal normal distribution curve, which is overlaid on the histogram. Upon visual inspection of Figure 7, it is evident that the distribution of the Forensic Accounting Skills data deviates noticeably from the smooth, symmetrical bell shape of the normal curve. The bars of the histogram show a distribution that appears somewhat skewed, with frequencies extending towards the higher end of the scale (indicating scores further from the central peak) more than would be expected in a truly normal distribution. As correctly observed, the presence of data points or bars in the tails of the distribution, potentially representing outliers or simply indicative of a non-normal pattern, contributes to this deviation. This visual evidence

from the histogram strongly supports the statistical conclusion drawn from the Shapiro-Wilk test (Table 8), which definitively indicates that the data for Forensic Accounting Skills is not normally distributed ($p = 0.000$). The Mean score for this variable is 1.89 (Std. Dev. = 0.575, $N = 85$). The combined visual and statistical evidence of non-normality confirms the necessity of employing non-parametric statistical methods for hypothesis testing related to Forensic Accounting Skills, as originally decided by the researcher.

Descriptive Analysis Results

The descriptive analysis results were based on frequencies that were tabulated from the primary data and analysed using SPSS version 20.

Table 10 below summarizes respondents' level of agreement on various statements concerning the effectiveness of forensic accounting techniques in detecting fraud in the Malawi public service.

Table 10: The Forensic Techniques' Effect in Detecting Fraud in the Malawi Public Service

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Forensic accountants analyze the facts of a situation and recommend a potential course of action.	24%	61%	5%	9%	1%	100%
A forensic accountant's primary functions are to investigate evidence of criminal activity and to help quantify or dispute financial damages.	36%	59%	4%	1%	0%	100%
During fraud investigations, auditors employ specialized software such as	28%	48%	16%	7%	0%	100%

Data mining tools, CAATs, ACL, and CaseWare IDEA.						
Forensic accounting is instrumental in the protection and recovery of assets.	25%	58%	13%	2%	2%	100%
A significant number of auditors involved in fraud investigations lack sufficient proficiency with forensic tools.	40%	41%	8%	11%	0%	100%
To form a preliminary assessment of a case, forensic accountants examine relevant documents focused on a specific area of loss.	20%	72%	7%	1%	0%	100%
Forensic accountants participate in discovery examinations to analyze testimony, clarify financial issues, and help formulate additional questions.	18%	73%	9%	0%	0%	100%
A forensic accountant's report, when filled with solid proof, makes a client's case stronger and helps prove the other side's arguments are wrong.	15%	66%	14%	5%	0%	100%
Proficiency in forensic auditing techniques leads to the efficient and timely detection of fraudulent transactions.	48%	45%	2%	4%	1%	100%
Throughout an investigation, a forensic auditor meticulously maintains a clear audit trail.	21%	45%	19%	13%	2%	100%

From the study 85% of respondents agreed that forensic accountant reviews factual situation and provides suggestions regarding possible course of action, the same was agreed on forensic Accountant searches for evidence of criminal conduct or assist the determination of or disproof of claimed damages by 95% of the respondents. When respondents were asked about Data mining, CAATs, ACL, and CaseWare IDEA are software used by Forensic Accountants when conducting fraud investigations. 76% agreed, while 82% also agreed that forensic Accounting provides assistance with the protection and recovery of public assets. 81% of respondents agreed that, to a greater extent, the majority of auditors involved in conducting fraud investigations have no adequate skills in forensic tools. The outcome from the, that forensic accountants review the relevant documentation to form an initial assessment of the case in an identified area of loss showed that 92% agreed that reviews are done, while 91% also agreed that, forensic accountants attend the examination for

discovery to review the testimony, assist with the understanding the financial issues and to formulate additional questions to be asked in investigations.

The findings indicate a broad consensus on the principles of forensic accounting. A significant majority of respondents (81%) affirmed the strategic purpose of a forensic accountant's report, agreeing that it is designed to support the client and rebut opponents based on evidence. An identical percentage (81%) also agreed that proficiency in forensic auditing techniques is crucial for the efficient and timely detection of fraudulent transactions. Furthermore, there was even stronger agreement on procedural transparency, with 92% of respondents confirming that forensic accountants maintain an audit trail during their investigations. Table 11 details respondent views on the effect of forensic accounting skills on fraud prevention within Malawi's public sector.

Table 11: The Effect of Forensic Accounting Skills on Fraud Prevention in the Malawi Public Sector

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Forensic accountants do have additional skills compared to traditional auditors in fraud prevention and detection.	47%	28%	9%	14%	1%	100%
Malawi's public services require forensic accounting services to detect and prevent fraud in ministries and departments	52%	36%	2%	7%	2%	100%
There are potential benefits of incorporating forensic accounting skills into fraud prevention initiatives in the public sector in Malawi.	51%	39%	7%	2%	1%	100%
Unlike the adoption of traditional investigation methods, Forensic audit-based investigation may assist the government in recovering its assets.	51%	44%	6%	0%	0%	100%
Forensic accounting techniques ensure that auditors strictly adhere to professional ethics.	39%	34%	21%	4%	2%	100%
Unlike traditional methods, the use of forensic accounting helps in the prevention of money laundering transactions.	24%	53%	13%	9%	1%	100%
The public service in Malawi does not have forensic accountants to help in fraud prevention and detection.	19%	48%	25%	7%	1%	100%
Having Forensic auditors in government would assist in the reduction of fraud cases.	35%	52%	5%	7%	1%	100%
To a larger extent, the adoption of forensic accounting techniques guarantees the speedy detection of fraud.	26%	60%	7%	6%	1%	100%
Forensic accounting helps enhance accountability and promote transparency in the public sector.	32%	56%	8%	2%	1%	100%
Forensic Accounting emerging technologies, such as data analytics and artificial intelligence, can help prevent and detect fraud.	39%	53%	6%	1%	1%	100%

From the responses from the respondents, they agreed that forensic accountants do have additional skills compared to traditional auditors in fraud prevention and detection, with 75%), while 86% of respondents agreeing that Malawi public services require forensic accountant services to detect and prevent fraud in ministries and departments. The survey highlights a

widespread consensus on the value of forensic accounting. An overwhelming majority of respondents believe it is key to both preventing fraud (90% agreement) and recovering assets (95% agreement), viewing it as a superior alternative to traditional investigation techniques. The survey results reveal strong support for the implementation and benefits of forensic

accounting. The highest level of agreement (87%) was for the idea that employing forensic auditors in government would assist in reducing fraud cases. Closely behind, 86% of respondents agreed that adopting forensic techniques ensures the speedy detection of fraud. Majorities also recognized its effectiveness in specialized areas, with 77% agreeing that it helps prevent money laundering and 73% stating that it promotes adherence to professional ethics. Underscoring the relevance of these benefits, 67% of respondents concurred that Malawi's public service currently does not have enough forensic accountants to effectively prevent and detect fraud. When respondents were asked about forensic accounting, they were asked if it helps enhance accountability and promote transparency in the public sector. 88% agreed.

A significant proportion (81%) also agreed that many auditors involved in fraud investigations lack adequate skills in forensic tools, and 92% agreed that forensic accountants leave an audit trail. Similarly, concerning Forensic Accounting Skills and their role in fraud prevention (Section B, Questions 11-21), the descriptive data indicates strong agreement among respondents on several key points. For instance, 75% agreed that forensic accountants have additional skills compared to traditional auditors in fraud prevention, 86% agreed that Malawi public services require forensic accountant services, 90% saw potential benefits in incorporating these skills, and 95% agreed that forensic audit-based investigation can assist in asset recovery. Respondents expressed widespread agreement on the broad impacts of forensic accounting. An overwhelming majority believe it enhances accountability and transparency (88%), helps reduce fraud cases (87%), and ensures speedy fraud detection (86%). Strong support was also shown for its role in specialized areas, such as preventing money laundering (77%) and encouraging professional ethics (73%). Notably, the highest level of agreement (92%) was on the importance of leveraging emerging technologies like data analytics, which reinforces the perception (67%) that more skilled forensic accountants are needed in the public sector. Collectively, these descriptive findings highlight a general consensus among respondents regarding the perceived value and importance of both forensic accounting techniques

and skills in combating fraud within the public sector. However, the descriptive analysis also revealed a concerning contextual issue: the perception that the Malawi public service currently employs very few individuals with the necessary forensic accounting knowledge or skills for investigative or fraud auditing roles (35). This is further compounded by the observation that traditional investigation methods are still predominantly used, rather than embracing newer techniques and software.

Inferential Statistics Findings

The inferential analysis found no statistically significant difference in the perception of forensic accounting techniques based on gender (Independent Samples T-Test, $p = 0.102$) or professional designation (One-Way ANOVA, $p = 0.486$). This suggests a broad consensus among public sector professionals on the value of these techniques.

As shown in Table 10, there is strong agreement on the effectiveness of forensic techniques, with 95% of respondents agreeing that forensic accountants help search for evidence of criminal conduct. Similarly, Table 11 shows that 90% see benefits in incorporating forensic skills into fraud prevention initiatives.

These positive perceptions align directly with the Fraud Diamond Theory. The emphasis on specialized skills and techniques targets the 'capability' element of fraud. By implementing robust forensic accounting, an organization enhances its detection ability, thereby reducing a potential perpetrator's capability to commit and conceal fraud. The finding that 81% of respondents believe current auditors lack adequate forensic skills highlights a critical vulnerability. This skill gap, consistent with research in other developing nations, creates an environment where the 'capability' of fraudsters is relatively unchecked.

Furthermore, the study's findings are likely mediated by institutional and technical factors specific to Malawi. The perceived lack of forensic expert witnesses, which contributes to delays in court cases, is a significant institutional factor that underscores the critical need for forensic accounting's litigation support function. The continued use of traditional investigation methods over modern tools represents a technical factor limiting the full potential of fraud detection. The strong agreement (92%) that emerging

technologies can help prevent fraud suggests professionals are aware of this technical gap and see value in closing it. The null hypothesis was rejected, which suggests forensic accounting helps in litigation support and helps the justice delivery system. Despite this statistical link, it was also noted that court case delays are frequently attributed to a perceived lack of available forensic expert witnesses (36).

Conclusion

In conclusion, this study provides evidence supporting the significant role of forensic accounting in combating fraud within Malawi's public sector, examined through the lens of techniques, skills, and litigation support services. The findings suggest that forensic accounting techniques are perceived to have an effect in detecting fraud and may offer a more effective and speedy approach compared to traditional methods, which is particularly relevant given the increasing incidence of fraud. Furthermore, the study supports the conclusion that forensic accounting skills positively impact fraud prevention, indicating that enhanced skills among auditors lead to greater knowledge and efficiency in preventing fraudulent activities. The study revealed a strong link between forensic accounting and litigation support in Malawi, underscoring its potential value to the judicial process. This contribution, however, is hampered by a perceived shortage of available forensic expert witnesses, which poses a significant challenge and may delay fraud prosecutions. Overall, the study underscores the critical, multi-faceted contribution of forensic accounting to improving financial accountability and transparency in Malawi's public service.

Policy Recommendations

To effectively incorporate forensic accounting into Malawi's current procurement, audit, and anti-corruption organizations, several actionable recommendations are proposed based on the study's outcomes. First, to address the critical skills gap identified among auditors, it is crucial to invest in targeted training and support for professional certifications like CFE and CISA. Additionally, to move beyond outdated methods, institutions should procure and provide training on modern forensic software and Computer-Assisted Audit Tools (CAATs). To strengthen legal outcomes, auditors must be trained in providing

effective court testimony, and a formal roster of qualified forensic experts should be established for the judiciary. Finally, these measures should be institutionalized by integrating proactive forensic techniques into standard audit methodologies and by establishing specialized units to lead investigations, shifting the approach from reactive to preventative.

Limitations of the Study

This study encountered several limitations that may affect the interpretation and generalizability of the findings. Beyond the time constraints, the research was impacted by methodological challenges related to data collection. The reliance on an online questionnaire, exacerbated by the emergence of the SARS-CoV-2 variant pandemic, presented difficulties in achieving the initially targeted response rate as participation was contingent on individual respondent convenience, which subsequently delayed data analysis. Furthermore, the online format and the scope of the questionnaire limited the ability to conduct detailed one-on-one follow-up interviews and explore other potentially relevant aspects of forensic accounting in the public sector, meaning the study could not cover all stakeholders or delve deeply into every pertinent issue.

Future Scope of Research

Building upon the findings that confirm the impact of forensic accounting techniques, skills, and litigation support services on fraud detection and prevention in Malawi's public sector, this study serves as a foundation for further investigation. Future research could expand upon these results by exploring the causality of the relationship between forensic accounting and fraud outcomes, potentially incorporating factors such as the independence of internal auditors. To enhance the generalizability of the findings, there is a need to replicate similar research in diverse contexts, including the private sector (e.g., commercial banks, non-governmental organizations) within Malawi and in other countries, to determine if the observed impacts and relationships hold true across different environments.

Abbreviations

CIAU: Central Internal Audit Unit, MDAs: Malawi Public Sector Ministries, Departments and Agencies, NAO: National Audit Office.

Acknowledgement

None.

Author Contributions

Mbaluso Rhoyd Chinkhando Banda: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing original draft preparation, Writing Review and editing, , Visualization, Himanshu Thakkar: Conceptualization, Methodology, Formal analysis, Writing original draft preparation, Visualization, Supervision, Saptarshi Datta: Validation, Data curation, Writing Review and editing, Haresh Barot: Validation, Writing Review and editing, Supervision, Jayendrasinh Jadav: Validation, Writing Review and editing, Supervision.

Conflict of Interest

The authors declare that they have no competing interests.

Declaration of Artificial Intelligence (AI) Assistance

The authors declare no use of Artificial intelligence (AI) for the write-up of the manuscript.

Ethics Approval

Not applicable.

Funding

This research received no external funding or specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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How to Cite: Banda MRC, Thakkar H, Datta S, Barot H, Jadav J. The impact of forensic accounting: a tool for fraud detection and prevention in the public sector in Malawi. *Int Res J Multidiscip Scope*. 2025; 6(4):1017–1035. doi: 10.47857/irjms.2025.v06i04.06423