AUTOMATED ACCOUNTING SYSTEM AND EXTERNAL AUDIT FEES: EMPIRICAL EVIDENCE FROM NIGERIA

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ABSTRACT

The recent development in electronic accounting has had dramatic influence on every aspect of external audit process especially on audit fee. The study therefore aims to examine the effect of automated accounting system (AAS) audit fee with focus on common audit client's characteristics. Descriptive research design was employed, and a four Likert's scale structured questionnaire was randomly distributed to five hundred and fourteen auditors in private practice while three hundred and eighty-nine were returned but only three hundred and sixty two found valid and subjected to analysis. Multiple Least Square was applied to test the first three hypotheses while the last was subjected to Partial Least Square - Structural Equation Model (PLS-SEM). The results revealed that AAS has positive and significant effect on audit fees in relation to client's complexity, size and profitability while there is substantial, positive and significant effect of AAS on audit fee. The study therefore recommends that audit clients should brace up for higher audit fee in this era of accounting automation and in accordance with Social Exchange Theory, for to do otherwise will not only harm audit firms but also audit clients.

Keywords: Automated Accounting; Electronic Accounting; Electronic Auditing; Independent Auditor; Audit Fees

INTRODUCTION

Modern financial Accounting System (FAS) has evolved over several stages but majorly from pre-double, double entry to post-double entry system. Similarly, several methods had been adopted in the recording of financial transactions notably among these are manual, mechanical and electronically. Manual mode of recording (commonly referred as traditional accounting) of financial transactions was the first of its kind and by then, it was the best in the history of accounting. However, that system is time consuming, prone to human (recording/arithmetical) errors and costly to manage.

Automation of accounting system (e-accounting) started with the introduction of machine into accounting process in which is gradually taken over the paper and pencil

accounting activities of organizations. In the early 1980's most big sized companies and banks in developing nations including Nigeria, employed automation into their payroll system and later brought in computer system into every aspect of accounting records in the management of receivables, inventories and to some extent, into payables. Computer system of that time is basically stand alone as there was no connectivity between systems. Accounting system of that age was semi-automated as recording still relied on paper and pencil.

The introduction of personal computer (PC) revolutionizes accounting system of banks and aviation industries and later embraced in manufacturing and commerce. Automated accounting system (AAS) is no longer a prerogative of big sized firms as all sizes of business except at micro had fully embraced technology into their accounting functions.

The arrival of e-accounting necessitates a new approach to audit as auditing must employ automation into every aspect of audit process. This requires involvement of technically skilled auditors to interact effectively with client's operating system. In addition, audit engagement staffs must be trained for relevance in audit field and audit firms need to acquire appropriate hardware and software that will facilitate auditing with computer. These new requirements demand for adequate funding of audit back office and for the provisions of modern assurance services. These new demands will reflect on the budget of audit firms with implication on audit fees payable by clients.

There had been concerted efforts toward the study of audit fees especially on the determinants of it but most of the extant literatures are on manually driven accounting system or with no direct focus on what could be the effect of automation of these determinants on audit fees. For instance, de Lima Castro (2015), Joshi et al (2021) and Liu, (2017) examined factors influencing audit fees without any consideration for accounting system in operation (whether manual or electronics). Hoffman et al (2017), Magablih, (2017) and Maghakyan et al (2022) paid particular attention on implication of automation on audit fees but this is an evolving field in accounting which wider contributions is very important, not only from practitioners or the academia but also from accounting professional institutions.

In addition, majority of existing studies on audit fees (Almeida & Silva, 2018; Liu, 2017; ullHaq & Leghari 2015; Ohioda & Omokhudu, 2018) are secondary data driven with limited provisions for the perceptions of the practitioners that are directly involved in the process both of automation, application, and determination of audit fees.

This study is therefore conducted not just to contribute to existing literature but to empirically determine the effect of automated accounting system on the client's characteristics with overall implication on audit fees. In doing this, the perceptions of practitioners are considered for the source of data for the study.

LITERATURE REVIEW

Conceptually, auditing of manual accounting system often referred as traditional accounting system that relies on paper and pencil in the recording of significant economics and financial transactions is tedious and not only challenging for staff of an organization/entity but also for external auditors. Generally, as paper and pencil is given way to laptops and desktops in every business operations and activities so is the automation of accounting and auditing. Automated accounting process has evolved from compliance to insight and strategy. (Wilson & Sangster, 1992; Chuma, 2020) and the need for organizations to reduce cost of invoicing, payroll and book-keeping led to the motivation for introduction of computer systems.

Audit fees need to be revisited due to automation and technology assisted audit, which reduces time, labour and costs, but adds additional costs, additional cost such as need to acquire necessary IT infrastructure for audit in a computer However, whether audit is conducted in an IT environment or not the concepts of audit fees remain the same.

There are series of definition or descriptions of audit fees by different authors and authorities. The following are the example of such efforts: From supply (audit firm) perspective, audit fee is a remuneration paid to an auditor for audit services rendered, while from demand (client's) perspective, audit fee is a cost incurred to secure audit services.   This is also described as the receipt by auditors for their services rendered.' (Kimel, 2016; Musa et al, 2021).

This study considers audit fees as price paid by audit client for the engagement of audit firms' physical and mental efforts for audit assurance services.   In the opinion of Adejuwon and Akinola (2022) the determination of price in a market-driven economy, there are two major factors that drive the process, and these are forces of demand and supply, that is, it is a bargain between buyer and supplier taken into consideration factors from each perspective. These two factors play important roles even in the determination of appropriate audit fees of an engagement and the concept of the forces of demand and supply featured prominently in the early attempt on determination of audit fee.

The supply perspective of audit businesses will naturally consider the resources required for an engagement, establish unit prices for each of the suggested resources, account for opportunity costs, and forecast a typical profit from the engagementThe number of segments, the size of the customer, the amount of inventory, and the amount of receivables will all be considered when determining the resources required for each engagement. Together with the aforementioned elements, the amount of client

profitability and the attention placed on client risk are also stated as determining factors for audit costs. (Hoffman & Nagy, 2017; Musa, 2017)

Demand process (Client's perspective) in audit fees involves what influences clients in accepting or rejecting a fee or factors that will be taken into consideration by audit client while negotiating with audit firm. Audit client will also consider auditor's size, reputation, industry specialization, competition, to mention a few. These are regarded as audit firm's attributes/characteristics. (Simunic, 1980)

The influence of these attributes differs from country to country and within a country. It also differs from industry to industry. Nevertheless, this study considered audit fee from the perception of the audit firms with examination of attributes of clients for the determination of a quote for audit assignment. Whether auditing involves clients using manual or electronic accounting system there is need to determine the most appropriate and just fees which should be beneficial to both party because high fee may damage the client while low fee may damage audit firm (de Lima Cstro et al 2015). In few instances, this determination is not left for audit firm and client to single handedly determined. Some professional bodies provide template to follow for determination of audit fee. e.g., Brazilians Association Standard in de Lima Castro et al (2015) and Institute of Chartered Accountants of Nigeria. (ICAN, 2015)

Automated Accounting System and Audit Fee Determination: Auditee's (Audit client's) Attributes

In order to determine the audit fee from a supply viewpoint, auditors will compare the attributes of a certain customer to the audit fee chargeable. The typical auditing company will look at what is necessary for a successful engagement implementation. These restrictions will have a significant impact on how audit fees are calculated for a certain assignment. Among the extremely high number of factors identified from audit firm's perspective, audit client's complexity, size and profitability are most common economic factors that significantly explain audit fees in the previous literatures and serve as the anchor factors for this present study. (Kimel, 2016; Ahmed & Abdullahi, 2016; Adejuwon & Akinola, 2022; Gonthier-Besacier, et al 2006).

a. Audit Client's Complexity

The audit firm's fees will, of course, be influenced by how complicated the client's operations are because this will necessitate more work throughout the audit engagement. Many yardsticks have been proposed and used to gauge how complex a client's activities are, such as the total of inventory and account receivables. (Musa et al.

2020; Almeida& Silva 2018; Liu, 2017; UllHaq&Leghari 2015)   Number of subsidiaries and branches of a client are sufficient indicators of how complex a client's business is for determining audit fees (Sumnic, 1980; Kimel, 2016 as cited in Mukah et al, 2021). According to de Lima Castro et al. (2015), directors' total compensation is a good indicator of an organization's complexity, and Sumnic (1980) added that turnover and accounts receivable also serve as indicators of complexity. The intricacy of the client could also be evaluated by type of organizational structure in place.

Whether a company adopt decentralized or centralized structure will have effect on how complex the operation's process of such firm and this with a direct association with audit work necessary to carry out a quality audit. It is expected that a more decentralized operation will require more attention with consequence for a higher audit fee. It is therefore necessary to determine the effect of AAS on audit fees in the context of client's complexity hence this study hypothesized that.

H1: Automated accounting system has no significant effect on audit fee in relation to client's complexity.

b. Audit Client's Size

The size of an audit client and audit fees has been strongly associated in prior studies. The size of the client is a consideration for the big four when determining the proper audit fees. To gauge the magnitude of a client's activity, variables like the client's total asset have been taken into consideration. It is of believe that the bigger the asset, the more demanding will the substantive test needed for audit evidence.

The number of team members with requisite technical skill in the use of technology will also be driven by the level of assets. Previous studies considered Asset Size (Liu, 2017; Joshi et al 2021; Ahmed & Abdullah, 2016; Musa et al 2020; Simunic 1980)   It is therefore expected that size will have influence on audit fees because it will determine time, efforts, skills and other resources needed to conduct an audit. This study therefore hypothesized that:

H2: Automated accounting system has no significant effect on audit fee in relation to client's size

c. Auditee's Profitability

Profitability is acclaimed to be measured of financial performance of organizations but in addition it is considered as a measure of level of operational activities in an organization when it comes to audit fee determination "Corporate profitability" is recognised as a key

factor in the cost of audit services and as a significant indicator of management effectiveness and success in allocating variable resources. Khasharmeh, (2018) cited Kikia (2015) to have corroborated the submission that audit fee is significantly influenced by profitability. Nevertheless, it is difficult to understand the rationale behind this.

From the standpoint of supply, why must a client's profit be the foundation for setting a price? What would the place of profitability be if size, complexity, and risk had been taken into account? However, in this study, behavioural measurement of profitability implications in determining audit fees would be taken into account. This is due to the fact that the higher the client's profitability, the higher the auditor's assessed degree of risk and the qualifications of the audit team required for the completion of the engagement.

Profitability levels may also have an impact on the degree of compliance and substantive testing required before an opinion may be formed. It is therefore hypothesized that:

H3: Automated accounting system has no significant effect on audit fee in relation to client's profitability.

Technology and Audit Fee

Advent of technology in form of hardware and software came with benefit of efficiency and this is manifested in the production process of clients, faster availability of service and reduction in cost of business. Technology also take over so many aspects that require man's effort and this led to reduction in number of employee and hours required for performance of auditing tasks. For audit clients in merchandise, it widen their market opportunities since the world is now a global village.

Accounting activities such as account receivables that require substantial man hours to manage and monitored is effortlessly taken care of with application of automation. Automation of this process promotes on-line and continuous monitoring of clients' activities by audit firm. The conduct of substantive tests on account receivable is now seamlessly carried out where automation is at higher level of connectivity. What is obtainable on account receivables applies to account payable, inventory management and payroll system. They are all historically common to automation.

Inventory management becomes efficient when appropriate software is deployed to perform its accounting requirements. Direct monitoring of stock level (minimum and maximum, determination of economic reorder quantity, prevention of theft and pilferage and lot more are the benefits of automation to clients while auditing inventory
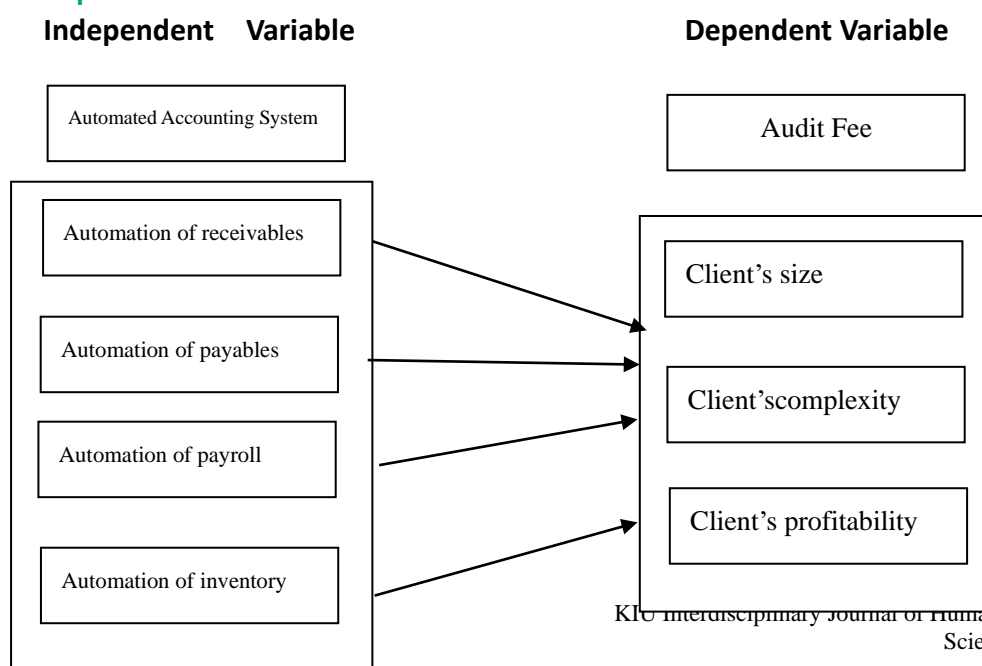
could be conducted on continuous basis as against once or twice a year activity with attendance bottleneck for clients and engagement team.

Payroll system becomes simple task with automation as employee's planning, costing, payment of emolument becomes faster which also foster industrial peace. This is also open to continuous audit with all the attendance benefits to both parties. Under manual accounting system, it is very demanding on engagements team especially for large sized clients to conduct necessary test to obtain evidence and minimize level of audit risk, but automated accounting eased some of these challenges which expectedly could translate to reduction of audit time required for engagements and which ought to lead to reduction of audit fees.

These benefits cannot be treated in isolation of set up costs, maintenance, and operational cost of automation as it affects audit firms. Firms must acquire hard/soft wares, provide other infrastructural environment for proper functioning of internet-driven system, and incur continuous training and retraining cost on existing and future employees. The audit operational cost in an automated accounting system makes it imperative to exercise caution in hastily concluding that automation should lead to reduction in audit fee. This study and subsequent efforts of other researchers will shed limelight into this and before long (if all stakeholders develop kin interest) empirical acceptable standard would be established.

It is therefore sufficient for the study to consider it appropriate enough for automation of accounting system to be measured with the application of technology by clients in the management of account receivable, account payable, inventory and payroll, thereby examine the relative and joint effect on the determination of audit fees.

Conceptual   Frameork

Independent   Variable   **Dependent Variable**

Automated Accounting System

Automation of receivables
Automation of payables
Automation of payroll
Automation of inventory

Audit Fee

Client's size
Client'scomplexity
Client's profitability

The above represent the connectivity between independent variables and dependent variable and this is the central theme of the study.

Akinola and Adejuwon (2022) studied the characteristics of audit client in the determination of audit fess in an automated accounting system environment. Data collected were descriptively analyzed using mean and standard deviation. The study found that audit client's size, complexity and profitability influence the determination of audit fees in technologically driven accounting system. However, the study did not provide the degree or direction of the influence and the study did not provide empirical influence of the findings.

Wang and Chi (2022) examined how the introduction and application of innovative technology affect audit fees and audit quality in China. Additionally, the study investigated whether this impact would vary under different ownership structures. Using the sample from Chinese listed firms and their annual reports, it was found that audit fees increase after the introduction and further application of innovative technology.

Magablih (2019) studied the impact of using technology in auditing on reducing the fees of auditors offices and companies in Jordan (Asia). The study was primarily designed to determine how technology can reduces audit fees but not how does technology affect the proxies of audit fee and the overall effect of technology on audit fees and find that the use of technology will significantly reduces audit fees. However, it is too early to take position on this finding but at least at short term, it is not likely that introduction of technology will reduces audit fees.

Khasharmeh (2018) carried out in study in Bahrain – Asia which examined factors influences price of audit service and it establishes that corporate year end and time lag between year-end and audit report, size of audit firm all have important effect on pricing of audit service. The study like most of extant literature was with no focus of technology on all determinant factors of audit fee.

Liu (2019) According to Liu's (2019) submission, different auditors receive various audit fees. Age, gender, educational background, sector expertise, position, and busyness all show strong connections with the audit fees, according to a regression analysis of data from listed firms in China from 2010 to 2015. The findings show that audit clients give individual auditors consideration when selecting audit services and pay a range of audit prices, offering empirical support for the choice and development of auditors.

A study that aimed to show factors that shape audit fees in Poland was conducted by Rewczuk and Modzelewski (2019). The study employed a linear regression model to

confirm the factors that influence audit fees. According to the study's findings, audit fees are positively correlated with a company's size, measures of complexity, and whether or not it is audited by one of the "Big Four" accounting firms, in addition to the ratio of inventory and receivables to total assets, all these without consideration for effect of technology.

Mohammed and Barwari (2018) examined the determinants of audit fees in the Alternative Investment Market (AIM) using a Sample of 23 Machinery Equipment Companies from 2007 to 2011. The findings indicate that the two most important factors affecting audit fees in the AIM are auditee size and auditee complexity. The results also showed a favorable correlation between audit fees and date of

Also, the research showed that there is no connection between charging for non-audit services and audit fees. As detailed as this yet with no focus on the implication of AAS on all the measures of audit fees.

Gonthier-Besacier and Schatt (2006) probed the factors influencing fees in France. The French situation is unique since the law mandates that companies that publish consolidated financial accounts engage in a collaborative auditing process with two independent auditors. On a sample of 127 French (non-financial) enterprises, the report details the amount spent on audit fees in 2002. The major finding is that the amount of audit fees is influenced by the size, risk, and presence of two Big Four firms. The rates charged (adjusted for company size) are much cheaper in comparison to those paid in the other circumstances when two of Big Four firms audit company's accounts.

Musah (2017) in Kanakriyah, (2020) examined the determinants of audit fees in Ghana with empirical evidence from Ghana Stock Exchange. Specifically, the study examined audit fee determinant which included the client size, profitability measured by ROA, LOSS, client risk measured by debt ratio, YEAR (season) and MNC. The study revealed that client's size of business, international recognition, affiliation of audit firms (Big four firms) and profitability are significant determinants of audit fee in Ghana. The study also failed to investigate possible implication of AAS.

Musa, et al (2020) Using a purposive sampling technique, it was examined how firm-specific variables affected the audit fees of listed consumer products firms in Nigeria. The findings showed that only auditee size and IFRS adoption are positively connected to audit fees, whereas the other components are negatively related to audit fees. The findings also showed that auditee size, auditee risk, auditee profitability, and IFRS adoption are the firm-specific characteristics that effect on audit fees.

Theoretical understanding of audit fee whether in a manually or electronically maintained accounting system centered on the desire of audit clients to ascertain the credibility of accounting information as presented by management of organizations and this led to the need to seek for services of an independent third party (external auditors) to express opinion on such records as prepared by the management. This is what is regarded as credibility theory in auditing. Market participants want to have confidence on the truthfulness and correctness of a financial report upon which can guide their decisions. It is this requirement that led to the thought and development of inspired confidence theory of audit.

Limperg (1926, 1932) developed a theory of audit called "inspired confidence theory" which suggest that external auditing instill confidence to various stakeholders on audited financial statement   and further akin the relationship between owners and public accountants to social interaction when it was asserted that "public accountant enters on the social scene" and by this Limperg link the theory with Social Exchange Theory even before that become a standalone theory. Whether credibility theory, inspired confidence theory or social exchange theory the most important is that "agent hires auditor to report on the fairness of agent's financial report. Agent pays auditors to reduce principal information risk" Eilifesen et al (2020).

This study therefore leverages on social exchange theory which was popularized by Homans (1961), as it fully captured the interactions between audit firm and their clients in the determination of audit fees.   The theory which its dominant emphasis was ON the individual behaviour of actors in interaction with one another. It was defined as 'exchange of activity, tangible or intangible, and more or less rewarding or costly between two persons" (Homans, 1961). Cook et al (2013) cited Blau (1986) that 'the reciprocal exchange of extrinsic benefits and exchange of benefits between owner of business and independent auditor and benefits are measured in terms of fee as a cost to audit client and income (fee) to audit firm. Shareholders (owners) must therefore be prepared for exchange of just and equitable value (compensation) for external auditor's opinion (social exchange)

METHODOLOGY

This study adopted descriptive survey design. The study was behavioural in natures to establish the perceptions of audit practitioners on the variables of the study and therefore relies on collection of primary data. The target population consisted of twenty-one thousand, five hundred and fifty (21,559) nine financial members of the Institute of Chartered Accountants of Nigeria as at May, 2022 (ICAN, 2022) out of which three hundred and ninety three (393) minimum sample size was determined with aid of

Taro Yamane's formula at 5% error of margin

However, five hundred and fourteen (514) independent auditors in private practice were randomly selected within six states that constituted Southwest geopolitical Zone in Nigeria for the distribution of questionnaire. A structured questionnaire was drawn on four Likert scale and contains three sections. Section A was on socio-demographic details of participants. Section B (i) consisted of four indicators of application of technology in accounting system which contains twenty-five questions while Section B (ii) sought for data on type of accounting software commonly in use in Nigeria among suggested five accounting packages while Section C addressed issues relating to clients' complexity, size and profitability with twenty-three questions altogether. A multi-stage sampling technique comprises of stratified and simple random sampling techniques were employing in the distribution of questionnaire. The distribution of questionnaire was done proportionately using the number of ICAN Districts in each of the selected states in accordance with Bowler's (1926) proportionate allocation model as cited in Pandey and Verma (2008).

Construct Validity

Factor loading test was carried out which assisted to eliminate questions of low or no value to the study while average variance extracted (a sub set test commonly called discriminant test) of construct validity was conducted and the results as shown below indicates that 99.9% of variables were above threshold hold of 0.5 (Zait & Bertea 2011; Web, 2022)

Table 3.1:   Reliability and Validity Result

Variables	Measures	FL	CA	CR	AVE
Independent	**AAS:**				
	Receivables	0.938	0.896	0.936	0.880
	Payables	0.724	0.602	0.771	0.534
	Inventory	0.887	0.873	0.883	0.791
	Payroll	0.908	0.743	0.966	0.826
Dependent	**Clients Characteristics**				
	Complexity	0.868	0.915	0.889	0.778
	Size	0.742	0.909	0.953	0.554
	Profitability	0.759	0.941	0.806	0.584

Source: Authors' computation (2022)

The result in Table 3.1 above that that Cronbatch Alpha coefficient of reliability (CA),

Composite Reliability (CR), and Average Variance Extracted (AVE) all exceeded the 0.6, 0.7, and 0.5 minimal standards, respectively, demonstrating the instrument's internal consistency, data sufficiency, and content validity (questionnaire). The conclusion that the instrument is accurate for measuring the variables under discussion is reached because all the constructs were over the minimal acceptable level.

Table 3.2: **Measurement of the Research Instruments**

Independent Variable	Predictive Parameters	No. of Items	Sources
1.Automated Accounting System	Questions raised on the application of automation on - Receivable - Payables - Inventory - Payroll	4	Simunic (1980); Liu (2017); Almeoda & Silva (2020). Musa et al (2020);
2.Dependent Variables: i. Client's complexity	Questions raised on: Number of branches and subsidiaries	7	Sumnic, (1980); El-Gammal, (2012); Safiuddin, (2016)
ii. Client's Size	Questions raised on: Sub-national and global spread of subsidiaries and branches	5	Simunic (1980); De Lima Castrol (2015) Ahmed & Abdullahi (2016) Ohidoa & Omokhudu (2018);
iii.Client's Profitability	Questions raised on: Level of profitability. Higher profit demands more audit	4	Silva et al (2019); Kimel (2016); Musah et al (2020); Joshi et al (2021);

Source: Authors' Conceptualisation (2022)

The composition and sources of research instrument is as given in table 3.2 above. Not only the concepts of the study derived from existing literatures but also the development of hypotheses was guided with the extant literature.

Model Specification

AUDFEE   = f(AAS)

Where:

AUDFEE   =   Audit Fee

AAS   =   Automated Accounting System

Arisen from the above function is the full model applied for this which is stated as follows:

$CLCOMP = \beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$ 3.1

$CLSIZ = \beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + e_i$........................ 3.2

$CLPROF = \beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$.........................3.3

$CLCOMP + CLSI + CLPROF = \beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$....3.4

Where:

β_0 =   Estimate of the y-intercept

$\beta 1$ =   Slope of the regression line

CLCOMP =   Client's Complexity

CLSIZ   =   Client's Size

CLPROF =   Client's Profitability

REC   =   Application of automated accounting to Receivables

PAY   =   Application of automated accounting to Payables

INV   =   Application of automated accounting to Inventory

ROLL   =   Application of automated accounting to Payroll

ei   =   Error term

Three hundred and eighty-nine (389) copies of questionnaire were completed and returned. Three hundred and sixty-two (362) were completed by those in audit services. These were subjected to analysis accordingly. Regression analysis was used for hypothesis one, two and three while Multiple Least Square (LSM-SEM) – Structural Equation Model was employed for hypothesis four. Regression analysis was found most appropriate to test the relative effect of independent variables on client's complexity, size and profitability while LSM-SEM is most appropriate to determine joint effects of independent variables on dependent variable.

RESULTS AND DISCUSSION

Descriptive Analysis

Table 4.1   Demographic Bio data for Research Questionnaire`

		Freq.	Pre(%)
Category of Staff	Audit Staff	362	93.1
	Others	27	6.9
Audit Staff	Junior	44	12.2
	Associate	64	17.7
	Semi-Senior Associate	50	13.8
	Experienced/Senior	102	28.2
	Assistant Manager	33	9.1
	Manager	14	3.9
	Consultant	11	3.0
	Associate Director	3	0.8
	Partner	22	6.1
	Principal Partner	11	3.0
	Managing Partner	8	2.2
Highest Educational Qualification	ND	20	5.5
	HND/B.Sc.	262	72.4
	M.Sc./MBA	67	18.5
	PhD	13	3.6
Professional Qualification	ATS	12	3.3
	ICAN	267	73.8
	ANAN	17	4.7
	ICAN in view	61	16.9
	ACCA	5	1.4
Working Experience	Less than 3	60	16.6
	3-10 years	168	46.4
	11-20 years	80	22.1
	21 years & above	54	14.9
Total		**362**	**100**

Source: Authors' Computation (2022)

From   table 4.1 above and under category staff, a total of three hundred and eight nine (389) questionnaire were properly filled and returned   physically/virtually through email/WhatsApp platform (Google for) but   out of which three hundred and sixty two (362) were found to be filled by respondents in external audit function making up 95.5% while twenty seven (27) of the total (4.5%) were filled and returned by those not in audit function. These twenty-seven (27) were regarded s invalid as their opinion will only constitute 'noise'. From the valid response about (41) 11.3% are Partners (Partner,

Principal Partner; and Managing Partner) and these are mostly the upper level of managements that are involved in the critical decisions as to engagement, planning the audit, evaluating evidence obtained in the course of an engagement and interfacing with clients' management as to the administrative aspect of engagement. Their involvement in this study proffers the necessary impetus not only on the content validity but also to the face validity. Also, middle level managements (Experienced/Senior; Assistant Manager; Managers, Directors and Consultants) that are the real players in all audit engagements constitutes 45% that is one hundred and sixty-three (163) of the respondents while their expressed opinion are highly influential to operationalisation of audit process. Lastly, those in Junior; Associate and Semi Senior Associate constitute 45% (163). Overall, the mixes of respondents on each stratified appears reasonable enough for the purpose of this study.

As regards academic and professional qualifications, three hundred and forty-two (342) 94.5%   respondents are graduates and two hundred and eighty nine (289) 79.8% are chartered accountants. In term of engagement/field experience one hundred and thirty-four (134) 37% had been in audit industry for over ten years, whereas one hundred and sixty eight (168) 45.3% had been in the industry for between three (3) and ten (10) years.

The above provide information as to quality of participants that provided their perceptions on what constitute effect of automated accounting system on audit fees, and the statistics above establishes that their express opinion could be relied upon.

Table 4.2   Accounting packages/software usage

Questions	Frequency	Percentage
Quick Book	48	3.26
Sage 50 Cloud	265	73.20
Wave Financial	14	3.87
Xero Accounting	4	1.10
ZohoBook	1	0.28
Others	30	8.29
Total	**362**	**100**

Source: Researcher's Computation from Field Survey (2022)

Table 4.2 above shows the accounting packages/software usage of various respondents. Based on the table above, 73.2% uses Sage 50 Cloud, 13.3% uses Quick Book while 5.3% uses Wave Financial, Zero Accounting and Zoho Book. 8.3% uses other accounting package not mentioned in the survey instrument.

The most commonly used accounting package in Southwest, Nigeria from this result is Sage 50 Cloud with 73% of respondents submitting that their clients uses the accounting package. The next in usage is QuickBooks accounting package and with 13% of respondents confirm that their clients use the accounting package. These results aligned with Itang (2018) that provides that Sage 50 Cloud is the most common accounting package in Nigeria.

H1: Automated accounting system has no significant effect on audit fee in relation to client's complexity.

Model 1: CLCOMP = $\beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$

Table 4.3   Regression Result

Audit Fee in Automated Accounting System's Environment : Client's Complexity						
Variables	Coefficient	Std Error	*p*-value	t-Statistics	*Multicollinearity Statistics*	
Constant	0.215	0.179	0.225	1.216	Tolerance	VIF
Receivables (REC)	0.029	0.011	0.044	2.636	0.924	1.082
Payables (PAY)	0.077	0.023	0.001	3.406	0.977	1.024
Inventory (INV)	0.001	0.032	0.000	18.621	0.811	1.233
Payroll (ROLL)	0.428	0.029	0.030	14.942	0.798	1.253
R	0.857					
R^2	0.734					
Adjusted R^2	0.731					
S.E. of regression	0.61911					
Sum Square resid.	136.839					
F-stat.	246.565					
Prob.	0.000					
Durbin-Watson	2.141					

Source: Authors' Computation from Field (2022)   )

Table 4.3 above shows a coefficient of determination (R^2) of 0.857 with probability value of 0.000 and this suggests that automated accounting system (AAS) cause a substantial, positive and significant variation of 85.7% to audit fees taken client complexity into consideration while other factors not consider in the study are responsible for 24.3% variation. The result of Durbin-Watson with value of 2.141 reflects the absence of autocorrelation in between independent and dependent variable.

The relative effect of application of technology in the management of receivables, payables and inventory and on audit fee in the light of client's complexity reveals that they all exert low, positive and significant   effect (β_1 = 2.9%; 7.7%; 0.1% with Pvalue of

0.044; 0.001; 0.000) respectively. The implication of this for example is that if other factors are held constant, a unit change in automation of receivable will bring corresponding change of 2.95 unit on audit fees within the content of the audit complexity. However, the result in respect of the effect of accounting automation of payroll is found moderate, positive and significant (β_1 = 0.428, t-statistics = 14.942, p-value = 0.0030) and that indicate that if other factors are held constant, a unit increase in the automation of payroll will cause 42.8% changes in audit fees through client's complexity.

F-statistics of 246.565 along with probability value of 0.000, p-value which is lower that critical value of 0.05 suggests that the model is good fit to predict the effect AAS on audit fee taking into consideration the client's complexities and more so, since p-value < 0.05, then null hypothesis is rejected while the alternative hypothesis that client's complexity has significant effect on audit fee in an automated accounting system's environment Tolerance test with values which ranges between 0.798 and 0.924 which are higher than 0.1 and variance inflation factor (VIF) test with value between 1.082 and 1.253 which are all below 10.0 suggests the absence of multicollinearity

H2: Automated accounting system has no significant effect on audit fee in relation to client's size.

Model 2: $CLSIZ = \beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$

Model 2: $CLSIZ = \beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$

Table 4.4   Regression Result

Audit Fee in Automated Accounting System's Environment : Client's Size

Variables	Coefficient	Std Error	*p*-value	t-Statistics	*Multicollinearity Statistics*	
					Tolerance	VIF
Constant	0.575	0.234	0.014	2.459		
Receivables (REC)	0.031	0.033	0.349	0.938	0.947	1.055
Payables (PAY)	0.707	0.044	0.000	16.111	0.688	1.453
Inventory (INV)	0.044	0.028	0.117	1.571	0.986	1.015
Payroll (ROLL)	0.164	0.045	0.000	3.654	0.705	1.419

R	0.764
R^2	0.584
Adjusted R^2	0.579
S.E. of regression	0.77496
Sum Square resid.	214.403
F-stat.	125.078
Prob.	0.000
Durbin-Watson	2.149

Source: Authors' Computation from Field (2022)

The table 4.4 above show that coefficient of determination (R^2) is 0.584 and this to say that 58.4% of variation in audit fees through consideration for client's size is caused by

automated accounting system while 41.6% is caused by other factors not considered in this study. The result for autocorrelation shows a Durbin-Watson value of 2.149 and this suggests non-existence of autocorrelation in the results of the study variables. In addition, the effect of application of automation in the management of receivables, payables, inventory, and payroll are mixed, while automation of payables (β_1 = 0.0707, t-statistics = 16.111, p-value = 0.000) and payroll (β_1 = 0.164, t-statistics = 3.654, p-value = 0.0030) have positive and significant. This suggest that if other factors are held constant, a unit change in the application of automation into the management of payables will bring a positive change of 70.7% to audit fee considering the client's size and a unit change in application of automation to payroll will lead to an increase of 16.4% on audit fee considering the client's size. Application of automation to receivables and inventory were find with positive but insignificant effect on audit fee (audit client's size). The results of multicollinearity shows a tolerance values that ranges between 0.688 and 0.986, also the result of VIF that ranges between 1.015 and 1.419 suggest absence of multicollinearity.

Statistics value of 125.078 and p-value of 0.000 establishes the good fit of the student model to predict the effect and since p value is less than critical value of 0.05 null hypothesis is therefore rejected and alternative hypothesis that posit that there is significant effect of automated accounting system has no significant on audit fee taken into consideration client's size.

H3:   Automated accounting system has no significant effect on audit fee in relation to client's profitability.

Model 3: CLPROF = $\beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$

Table 4.5   Regression Result

Variables	Coefficient	Std Error	p-value	t-Statistics	Multicollinearity Statistic	
					Tolerance	VIF
Constant	0.828	0.253	0.001	3.271		
Receivables (REC)	0.116	0.038	0.002	3.050	0.945	1.058
Payables (PAY)	0.132	0.033	0.000	3.521	0.979	1.021
Inventory (INV)	0.234	0.064	0.000	4.147	0.431	2.320
Payroll (ROLL)	0.843	0.060	0.030	14.942	0.432	2.315
R	0.714					
R^2	0.509					
Adjusted R^2	0.504					
S.E. of regression	0.89674					
Sum Square resid.	287.077					
F-stat.	92.586					
Prob.	0.000					
Durbin-Watson	2.099					

Audit Fee in Automated Accounting System's Environment : Client's Profitability

Source: Authors' Computation from Field (2022)

Table 4.5 above reveals that coefficient of determination is 0.509 which suggest that

50.9% variation in audit fee when client's profitability is put into consideration is caused by the automated accounting system while 49.15% variation was caused by the other factors considered in this study. Test for autocorrelation between variables of the study reveal a Durbin-Watson value of 2.090 which establish the absence of autocorrelation.

The individual influence of chosen elements of AAS shows that if other factors are held constant that a unit change in the application of automation to receivables will bring about a significant positive (β_1 = 0.0116, t-statistics = 3.050, p-value = 0.002); the effect of a unit change in payables automation (β_1 = 0.132, t-statistics = 3.521, p-value = 0.000) will cause a change of 13.2% to audit fee taking into consideration client's profitability as a factor in audit fee determination. Also, unit change in automation of inventory (β_1 = 0.234, t-statistics = 4.147 p-value = 0.000) will bring a significant and positive change of 23.4% to audit fee when client's profitability is considered as a factor in the determination of audit fee. In addition, a unit change in payroll automation will bring a significant and positive change inventory (β_1 = 0.843, t-statistics = 14.942, p-value = 0.000)

Results of test conducted to establish presence of multicollinearity shows it absence as tolerance shows results ranging between 0.431 to 0.945 while the VIF is between 1.021 and 2.320. F-statistics reveal a value of 92.586 and p-value of 0.000 which is less than critical value of 0.05 hence the results indicate the good fit of the model for the determination of effect. Moreso, since p-value of 0.000 < 0.05, the null hypothesis is rejected while the alternate hypothesis that states that automated accounting system has significant effect on audit fee taken into consideration client's profitability is accepted.

H4: Automated accounting system has no significant effect on audit fee
Model 4: *CLCOMP*+CLSIZ+CLPROF = β_0 + β_1REC + β_2PAY + β_3INV + β_4ROLL + ei
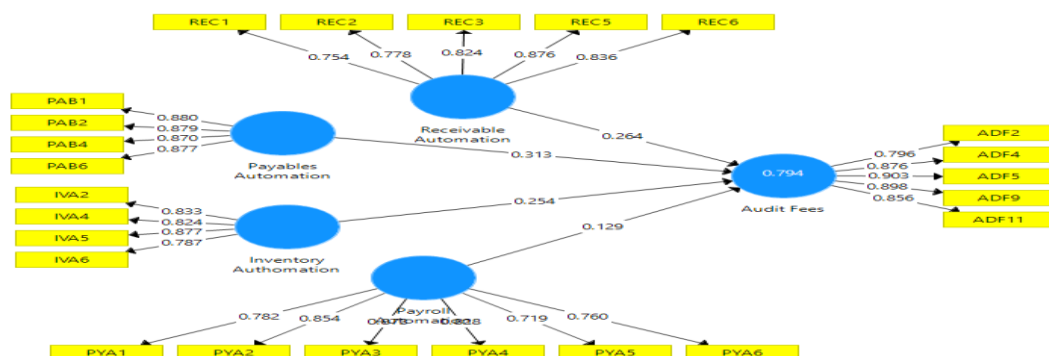
Figure 4.1:   Path Analysis for Hypothesis Four
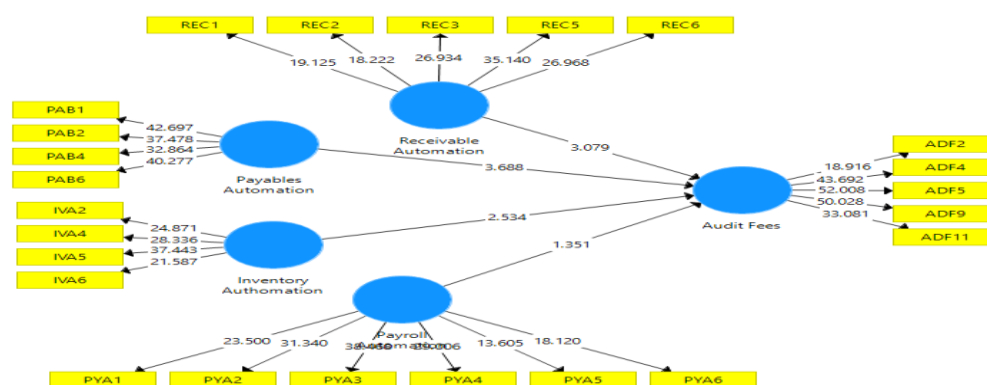**Source: Authors' Computation via SmartPLS V3.3.9 (2022)**

Figure 4.2: **T-Statistics for Hypothesis Four (2022)**
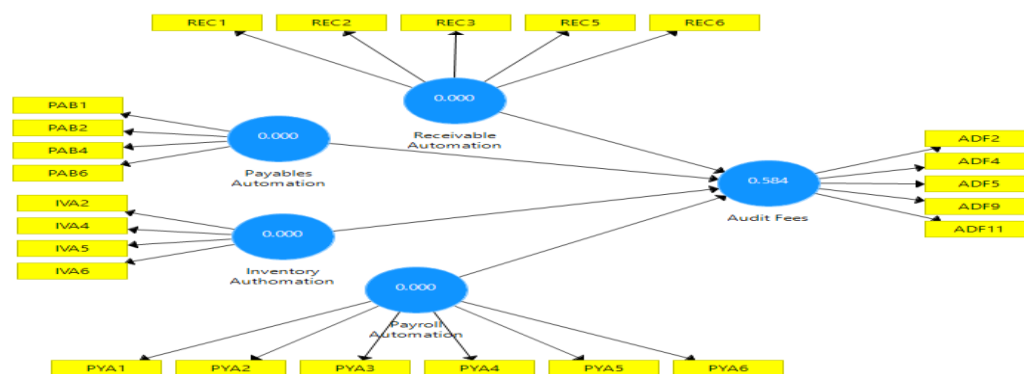**Source: Author's Computation via SmartPLS V3.3.9**

Figure 4.3: **Q² Statistics for Hypothesis Four**
Source: Authors' Computation via SmartPLS V3.3.9

Figure 4.1 presents the results of PLS-SEM analysis for the effect of automated accounting system dimensions on audit fee and this provides the predictive power of this study's model   From the results, the adjusted coefficient of determination (*Adj R²*) of 0.785 showed that automated accounting system dimensions explained 78.5% of the changes in audit fee while the remaining 21.5% variation in audit fee is explained by external factors different from automated accounting system dimensions considered in this study and the effect is statistically significant at 95% confidence interval and p value less than 0.05. This result suggests that automated accounting system influenced 78.5% of the audit fee. The effect of automated accounting system on audit fee is substantial based on the threshold of 0.75; 0.50 and 0.25 interprets to be substantial, moderate and weak respectively (Sarstedt et al 2017)

Fig. 4.2 shows the path coefficient of each automated accounting system dimensions (inventory automation, payables automation, payroll automation and receivables automation) (β) represents the coefficient of determination which shows the relative

effect of each automated accounting system dimensions on audit fee. Results in figure 2 reveals that all automated accounting system dimensions have positive and significant effect on audit fee except for payroll automation with insignificant relative effect. Specifically, the results revealed that at 95% confidence level, inventory automation (β = 0.254, t= 2.537), payables automation (β = 0.313, t= 3.572), and receivables automations (β = 0.264, t= 3.263), were statistically significant as their p-values were less than 0.05 and their t-values greater than 1.96. However, the relative effect of payroll automation (β = 0.129, t= 1.370) has a t-value below the threshold of 1.96 to suggest that the relative effect is statistically insignificant.

These translate to the fact that taking all other independent variables at zero, a unit change in inventory automation holds plausible increase of 0.254 in audit fee given that all other factors are held constant. Similarly, the result shows that a unit change in payables automation will lead to a 0.313 increase in audit fee given that all other factors are held constant. Lastly, the result shows that a unit change in receivables automation will lead to a 0.264 increase in audit fee, given that all other factors are held constant.

Fig 4.3 shows the predictive relevance of the model using Stone-Gleisser Q^2 value. Q^2 values of 0.02, 0.15 and 0.35 represents small, medium, and large predictive relevance (Sarstedt *et al*, 2017). Q^2 above zero confirm that the structural model specified is relevance. According to table 4.3, Q2 value of audit fee is 0.584. and this indicates that automated accounting system has a large degree of predictive relevance with regards to its effects on audit fee; and for this reason, the structural model specified is relevant and has sufficient predictive quality. On the strength of the PLS-SEM summarised results in table 4.9.3 (*Adj R²* =0.785, p=0.000, Q^2 =0.584), this study can conclude that automated accounting system have significant and substantial effect on audit fee hence hypothesis four (H4) which states that automated accounting system has no significant effect on audit fee is therefore rejected.

Table 4.6 Summary of the PLS-SEM for the effect of Automated Accounting System on Audit Fee

Path Description	Original sample (o) Unstandardized Beta	t	Sig.	R²	Adj R²	Sig
				0.794		0.78!
				0.584		
Inventory Auto: Audit Fees	0.254	2.537	0.011			
Payables Auto: Audit Fees	0.313	3.572	0.000			
Payroll Auto: Audit Fees	0.129	1.370				
Receivable Auto: Audit Fees	0.264	3.263				

Source: Author's Result via SmartPLS Version 3.3.9 (2022)

Table 4.6 above provides summary of predictive, significant of finding, probability value and predictive relevance of the study's model (Q^2) while it also shows summary of relative effect of each of the dimensions of automation of the selected accounting activities, e.g., coefficient (β), t-statistics and probability value for each dimension.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study found that AAS has positive and significant effect on audit fee with due consideration of client's complexity and this could be attributed to the fact that the high the level of client's operational complexity the more of man hour and technical skill manpower are needed by independent auditors in auditing of a client's activities even in an automated accounting environment and this will affect the fee quoted by audit firm. The finding aligned with Carcello and Albert Nagy (2004) cited in Rewczuk and Modzelewski (2019), Mohammed and Barwari (2018), de Lima Cstro et al (2015) that found a positive relationship between audit fee and client's complexity.

The earlier studies were conducted with no specific attention on the implication of automation; nevertheless, the finding of this study now establishes that as clients' complexity affects audit fees determination in a manual accounting system so it is in AAS. The more the complexity of clients operation, the more time, efforts, resources require of audit fee and this will translate to higher audit fees. This study also finds that there is substantial, positive and significant effect of accounting automation on audit fee in relation with client's size has positive. Previous studies considered the implication of client's size on which Musa et al (2020) found a positive relationship between audit fee and client's size, while El-Gammal (2012) found that the larger the client is the more audit services would be required.

Safiuddin and Moshin (2016) also find that audit fees are significantly influenced by client size (total assets of client). This study further establishes that AAS in relation with client's profitability do have positive and significant effect on audit fee. This finding is akin to the fact that the higher the level of client's profit over the year the more audit firm pays special attention to any misstatement or mistake during substantive test. This of course will lead to client to pay a premium. There are conflicting results from previous studies as the like of Safiuddin and Moshin (2016) found that there is insignificant relationship between audit fee and client's profitability while Musah, 2017 in Ghana found positive and significant relationship between audit fee and client's profitability but Musa et al (2020) in Nigeria found a negative and significant relationship between audit fee and client's profitability.

Overall, this study find that automated accounting system (AAS) have a positive, substantial, and significant effect on audit fee. This explains that auditing of accounting records and activities in an automated accounting system will lead to payment of price premium (increase in audit fees). This result aligned with that of Wang and Chi (2022) that fond that audit fees increase after the introduction of innovative technology. However, Magablih (2019) finding conflicted with this as the study submitted that there is a significantly significant reduction of audit fees on the introduction of technology. but the present study's findings support the view that audit firm will have to invest in the training of audit engagement staff to acquire special skills needed to function in such an environment. Also, audit firms will have to acquire appropriate soft, and hardware needed to interact with client's servers. This will affect audit firm's budget and as suggested in Social Exchange Theory (Cook et al, 2013) the need to reward audit efforts adequately.

Conclusion and recommendations

The empirical study of effects of accounting technology on various aspect of external audit process is much more at its infancy. This study taken from practitioners' perceptions found that extant studies on the determination of audit fee in a manually maintained accounting system need a revisit and demand greater attention than presently ascribed.

It is therefore recommended that both academicians, public accountants, professional bodies should pay due attention into studies in this area, the findings which would be of benefits to country where there are structures pertaining to audit fees. In addition, audit clients should start to make adequate budget provision for fee premium and the need to realize that introduction of technology into their operations may not necessarily translate to reduction in audit fee.

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