Moderating Role of Accidental Destruction of Data on the Relationship between Computerized Accounting Systems and Audit Risk Management: Evidence from Kenyan Public Sector

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Abstract:

Advancement of technology has created significant risks related to ensuring the security and integrity of computerized accounting and audit risk management in organizations. Previous studies produce mixed results on the relationship between accounting security threats and the accounting security controls. Therefore the purpose of this study was to assess the influence of accidental destruction of data on the relationship between computerized accounting systems and audit risk management in the public sector institutions. The study was anchored on the System Theory and guided by quantitative positivism paradigm. The study adopted a correlational survey research design. The target of the study population constituted 53 state owned enterprise in all the ministries and agencies operating in Kisumu County. Both Primary and secondary data was used in the study. Hierarchical multiple regression analyses were used to assess the relationship between the variables in this study. The findings of the study were that the change in coefficient of determination of accidental destruction of data was significant and positive (R^2 change= 0.078, $p< 0.01$) implying that accidental destruction of data indeed moderate the relationship between computerized accounting systems and audit risk management. The study recommends that accidental destruction of data should be emphasized by the public firms as it amplifies the prediction of computerized accounting systems on their audit risk management and computerized accounting systems. The study findings will be of significance to public institutions policymakers and other stakeholders in designing the computerized systems, minimizing accounting security threats and maximizing the audit risk management performance. In addition, provide new evidence and form a basis for future research in the area of accounting security threats, computerized accounting systems and audit risk management.

Key Words:

- Accidental destruction of data
- Computerized accounting systems
- Audit risk management

Introduction:

Information security risks is one of the important areas when operating the information system of which today it is highly sophisticated as a computerized system. Information technology (IT) based organizations are more concerned with the information when dealing with their clients (Martin, 2005). The information technology inevitably provides room for cybercrimes. For example, banks and other institutions continuously upgrade their computerized system, as they work towards reducing cybercrimes. The increase usage of computers and technological devices and gadgets that are user-friendly such as; laptops, iPods and smart phones; have open up areas for information exploitation and manipulation. Hence, securing of information assets from dishonest and deceitful groups of individuals is an utmost important for any institutions.

The evolution of computer technology has completely transformed accounting systems, and studies have shown that financial outcome of a firm will always depend on how much one invests and improves the accounting information system being used (Imeokparia, 2013). In the area of accounting and finance, the use of hand in financial reporting has been replaced by the use of computer softwares to enable quick reporting and easy processing and storage of financial information, hence due to facilitation of accounting softwares, preparation and access of financial statements and use of accounting procedures has been made easy (Kharuddin*et al.,* 2010). In the current business world, failure to use computer software almost implies that financial information may not be accurate, delays in financial reporting, and that financial information may not be stored for a long time.

A computerized accounting system can be referred to as an accounting information system that processes the financial transactions and events to produce accurate accounting results as per the user requirements or guidelines. In a computerized accounting system, the process of storage and handling of data, which is normally referred to as operating environment consists of computer hardware and software under which the accounting system operates. Computer hardware and software are interdependent and so one cannot do without the other. The link here is that, the type of accounting system employed determines the operating environment. More so, the nature of software used determines its hardware so selecting computer hardware depends upon several factors like the number of users, secrecy level and the sectional or departmental activities in the bank, etc. (Adamaka, 2013).

Computerized accounting systems generate accounting information that help rationalize and support economic decisions which affect the resources of communities and consequently the well-being of community members (Kahaleh, Hanan, 1997). The accounting system is strongly connected with various administrative processes; it helps rationalize decisions, makes the administrative process more effective in satisfying the needs of the organization's management and raises the levels of performance in order to realize goals (Kehale, *et al.,* 1997).

Empirical literature show that computerized accounting systems is important in managing audit risk on a timely basis and the communication of that information to the decision makers (Loch *et al.,* 2012; Ryan and Bordoloi, 2007). Whereas some studies (White and Pearson, 2011; Abu-Musa, 2011 and Warren, 2012) focus on security practices of computerized information systems, others (Henry, 2007; Hood and Yang, 2008) study perception of MIS executives regarding the security threats and accounting systems in banking sector as opposed to public sector. On the contrary, some studies (Patrick *et al*., 2013; Huntone*t al*, 2015) explore the extent of practice of financial auditing

and information systems among firms using descriptive research design. Moreover, others (Peterson *et al*, 2010) explore the computerized accounting systems and financial statements quality. Therefore, no prior studies that evaluate the moderating influence between accidental destruction of data on the relationship between computerized accounting systems and audit risk management in public enterprises.

THEORETICAL FOUNDATIONS

This study was anchored on systems theory**.** In Systems theory, Wang (2005) refers to information in the sense that assuming information does not necessarily involve any conscious mind, and patterns circulating (due to feedback) in the system can be called information. In other words, it can be said that information in this sense is something potentially perceived as representation, though not created or presented for that purpose. According to Kang'ethe (2002), a system is a group of related and interacting components, which work together to achieve a desired purpose or set of objectives. The need to have control elements to ensure that the process gives the desired level of output and avoid or reduce wastage. The need for efficiency and effectiveness therefore brings forth another need of ensuring harmony and synergy between the human resource in terms of perceptions as the core resource that controls other resources on the one hand and the other tools of trade, in particular modern ICT on the other hand so as to realize the objectives of office secretarial management. There is therefore the clear need to understand the perception of human resource and areas with potential for conflict in the course of interaction between the human resource and modern ICT. When computer and communication technologies are combined, the result is information technology systems, or "InfoTech". Information technology is a general term that describes any technology that helps to produce, manipulate, store, communicate, and or disseminate information. Presumably, when speaking of information technology as a whole, it is noted that the use of computers and information are associated.

Prior studies report mixed results on computerized accounting systems and audit risk management (Peterson *et al.*, 2010; Henry, 2007). Some studies (Peterson *et al.*, 2010; Huntonet al., 2015) attribute these mixed results to ERP environment and audit control mechanisms while others (Coffin and Patilis, 2001; Wright, 2012) cite organizational effectiveness and internal audit as the main issues behind the divergence results. Other studies (Warren, 2012; Abu-Musa, 2011; Coffin and Patilis, 2011) simply link security practices to computerized accounting systems. Therefore, the moderating role of accidental destruction of data on the relationship between computerized accounting systems and audit risk management has not been investigated.

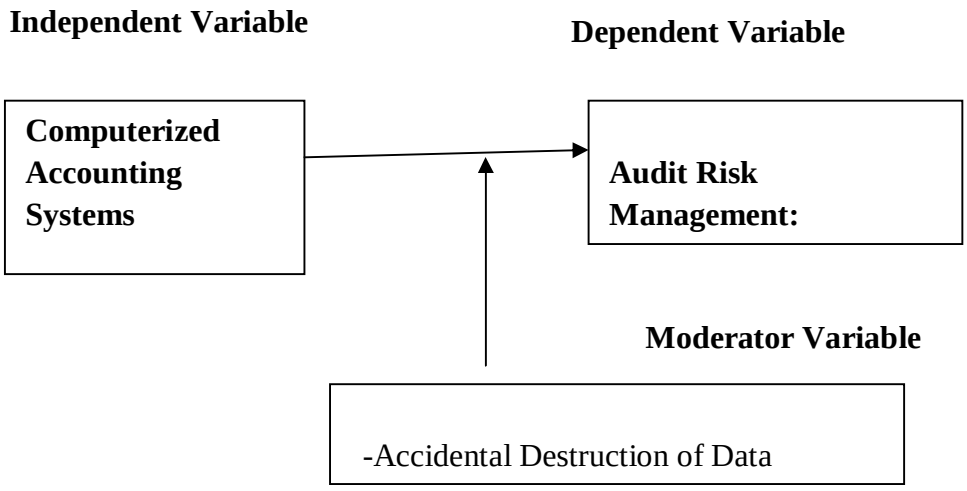

Figure 1: Depicting the relationship between the variables

Research Methodology

The study adopted a correlation survey research design. According to Nachmias and Nachmias (2008), a survey design is most suitable in a research aimed at establishing a problem and determining its extent. The study focused on all the 53 public enterprises operating in Kisumu County in relation to accidental destruction of data, computerized accounting systems and audit risk management. These enterprises provide public goods and services.

The data collected was analyzed using descriptive and inferential statistics. Descriptive statistics was used to summarize and analyze the data, involving measures of dispersion and central tendency where means and averages and regression analysis. Regression analyses were used to assess the relationship between the variables in this study (Marsh *et al*., 2011). Content analysis was performed on qualitative data.

The regression model below was adopted;

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 Z_i + \varepsilon_i$ ……..……...……(3.1)

$Y = \beta_0 + \beta_1 X_i + \beta_4 Z_i + \varepsilon_i$ ……..……...…….(3.2)

Where:

Y= Dependent Variable (Audit risk management).

X_i= theoretically defined Independent Variable (computerized accounting system indicators; i= 1,2…n).

Z_i= theoretically defined moderator variable (accidental destruction of data: i = 1, 2…n).

$\beta_0, \beta_1, \beta_2$ and β_3 are regression equation coefficients.

ε = error term of the regression.

Diagnostics of Regression Model

Since multiple regression analysis requires that the assumptions of normality, homogeneity of variances, linearity and uncorrelation of errors be met, these assumptions were therefore first tested.

Testing for Normality

Normality was assessed using measures of skewness and kurtosis (Tabachnick and Fidell, 2001). The distribution was considered normal if skewness and kurtosis values fell within the interval -2.0 to 2.0. As shown in Table 3.2, the skewness and kurtosis values for all variables were within the acceptable interval. Normality assumptions were therefore met.

Table 3.2: Testing for Normality Requirements

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Computerized Accounting systems	-.320	.191	.231	.379
Accidental detsruction of data	-.057	.191	-.336	.379
Audit Risk management	-.049	.191	-.440	.379

Source: Survey Data (2018)

Testing for Homogeneity of variances

The Levenne statistic for equality of variances was used to test for the assumption of homogeneity of variances. The study posited that the variance of each public enterprise was the same. Table 3.3 shows that in testing at the 0.05 level of significance; none of the Levenne statistics was significant. The assumption of homogeneity of variances was not violated.

Table 3.3: Testing for Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Computerized Accounting systems	.136	2	159	.873
Accidental destruction of data	1.054	2	159	.351
Audit risk management	1.275	2	159	.282

Source: Survey Data (2018)

Testing for Linearity

Pearson's product moment correlation coefficients were used to examine the assumption of linearity. Results displayed in Table 3.4 indicate that there were both negative and positive associations among predictor variables as well as between predictor variables and the criterion variable (audit risk management). The linearity assumption was not violated.

Table 3.4: Testing for Linearity

	1	2	3
1.Computerized accounting systems	1		
2.Accidental destrcution of data	.611**	1	
3.Audit risk management	.472**	-.532**	.572**

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Survey Data (2018)

Testing for Independence of Errors

The Durbin–Watson statistic was used to test whether prediction of dependence errors were correlated. The errors were deemed to be uncorrelated if the Durbin-Watson statistic was found to be within the intervals 1.50 – 2.50 (Tabachnick and Fidell, 2001) or 1.0 to 3.0 (Field, 2005). As shown in Table 3.5, the Durbin-Watson statistic was found to be 1.997 which implies that the errors were uncorrelated.

Table 3.5: Test for Independence of Errors (Durbin Watson Test)

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	.864	.240		3.601	.000		
	Computerized accounting systems	.146	.072	.162	2.031	.044	.602	1.662
	Accidental destruction of data	.184	.074	.215	2.475	.014	.507	1.973
	Durbin-Watson	1.997						

Dependent Variable: Audit Risk management

Source: Survey Data (2018)

RESULTS AND DISCUSSION

Extent of Accidental Destruction of Data

The extent of accidental destruction of data among public enterprises in Kisumu County was measured using three items namely; intensity of accidental destruction of data, extent of employee accidental actions on data and frequency of unauthorized access to accounting information by hackers. Respondents were asked to rate how given accidental destruction of data activities occurred within their enterprises. Responses were elicited on a 5-point scale (1-very low, 2-low, 3-moderate, 4-high, and 5-very high). These responses were then analyzed using frequencies, means and standard deviations. Results presented in Table 4.2 suggest that the respondents tended to rate lowly all the accidental destruction activities within their firms. The mean response score for all the items was 2.4, coded as low. The most lowly rated activity was the frequency of unauthorized access to accounting information by hackers (M=2.23, SD=1.25) while the best rated activity was the employee accidental actions on data (M=2.4, SD = 1.28). Besides, the small values of the standard deviations imply that there were minimal variations in the responses on the items that were rated.

Table 4.2: Rating of Extent Accidental Destruction (n=47)

Accidental Destruction of data occurrences	**V.low**		**Low**		**Moderate**		**High**		**V.high**		**Total**	
Overall Mean score = 2.4	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**M**	**SD**
Intensity of accidental destruction of data	17	16.2	10	21.3	10	21.3	6	12.8	4	8.5	2.4	1.33
Extent of employee accidental actions on data	14	29.8	13	27.7	10	21.3	6	12.8	4	8.5	2.4	1.28
Frequency of unauthorized access to accounting information by hackers	15	31.9	16	34.0	8	17.0	4	8.5	4	8.5	2.3	1.25

1-v.low, 2-low, 3- moderate, 4-high, 5-v.high *Source: Survey Data (2018)*

Source: *Survey Data (2018)*

The results imply that public firms in Kisumu County are not proactively engaging accidental data destruction. The firms put less emphasis on activities related to accidental destruction of accounting data in line with both theory and research advances.

These results support argument by Abu-Musa (2011) that accidental destruction of datashould notbe emphasized as it is intensity of various actors within and between firms, which leads to the compromising data integrity and security. The findings are at variance with those of Henry (2007) indicates that 80.3% of the companies backed-up their accounting systems. 74.4% of the companies secured their accounting system with passwords, but only 42.7% utilized protection from viruses. Physical security and authorization for changes to the system were employed by less than 40% of the respondents. The survey results also showed that only 15 companies used encryption for their accounting data, which was a surprising result, considering the number of companies utilizing some form of communication hardware. Almost 45% of the sample underwent some sort of audit of CAIS data.

The sought to ascertain the moderating effect of accidental destruction of data on the relationship between computerized accounting system and audit risk managementof public firms in Kisumu County Consequently, the following multiple regression model was estimated.

$Y_1 = ß_0 + ß_1X_i + ß_2Z_i + ß_3XZ_i + \varepsilon_i$

Where Y_1 = Audit risk management

X_1 = computerized accounting systems

Z_1 = Accidental destruction of data

XZ = Interaction of computerized accounting systems and accidental destruction of data

$ß_0$ = Constant term

$ß_1$ = Main effect of X on Y

$ß_2$ = Main effect of Z on Y

Table 4.3: Summary Statistics

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R^2 Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
Dimension	1	.636[a]	.405	.398	.54091	.405	54.138	2	44	.000	
	2	.695[b]	.483	.474	.50566	.078	23.937	1	43	.000	1.987

a. Predictors: (Constant), Accidental Destruction of data, Computerized Accounting Systems
b. Predictors: (Constant), Accidental Destruction of Data, Computerized Accounting Systems, INTERACTION
$ß_3$ = Moderation effect
ε = Residual in the equation
c. Dependent Variable, Audit Risk Management
Source: *Survey Data (2018)*

The study therefore tested the interaction between computerized accounting systems and accidental destruction of data. Hierarchical regression was used by first entering computerized accounting systems and accidental destruction of data in step 1, and then entering the interaction variable (standardized computerized accounting systems * Standardized accidental destruction of data) in step 2. The standardized values were used for the interaction variable so as to reduce threats of multi-collinearity by reducing the size of any high correlation of computerized accounting systems or the accidental destruction of data with the new interaction variable. The change in R^2 was then assessed such that if R^2 change was found to be significant, then the moderating effect was confirmed. Results shown in Table 4.3 indicate that the R^2 change was a significantly ($p<0.01$) positive at 0.078 when the interaction variable was added to the predictor and moderator variables. This change though small was significant. The variables in the two models model a= computerized accounting systems and accidental destruction of data, model b=computerized accounting systems, accidental destruction of data and interaction) are also found to predict variance in the audit risk management of the firms significantly differently (Model a- F change= 54.138, $p<0.00$; Model b- F change=23.937, $p<0.00$).

The significant interaction indicates that the presumed moderator (accidental destruction of data) does actually moderate the effect of the predictor (Computerized accounting systems) on the outcome variable (public enterprises audit risk management). The hypothesis that accidental destruction of data moderates the relationship between computerized accounting systems and audit risk management was therefore supported. The adjusted R^2 of model (a) is 0.398 and its R^2 is.405 for the main model with accidental destruction of data while when the interaction of accidental destruction of data with main predictor variable is also introduced in the model, R^2 is .483 with adjusted R^2 dropping to 0.474. The differences in the two cases of R^2 for each model are less than a ceiling of 0.5 (Field, 2005). This small change implies the models are valid and are stable for prediction of dependent variable, audit risk management, at 40.5% and 48.3 % variance respectively. According to Aikin and West (1991) power to detect interaction effects is often low because of the small effect sizes observed in social science. Fairchild and Mackinnon (2009) note that interaction effect; in this case 7.8% is normally very low but never the less confirm moderation. He argues that models that simultaneously examine mediation and moderation effects are at an even

greater disadvantage as they involve several interaction terms as well as estimation of indirect effects. Their effect is often as low as 1%. This effect though small, confirms the moderation.

Table 4.4: Influence of Accidental Destruction of Data on the Relationship Between Computerized Accounting Systems and Audit Risk Management

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	.935	.241		3.875	.000		
	Computerized Accounting Systems	.700	.067	.639	10.398	.000	.992	1.008
	Accidental Destruction of Data	.030	.055	.033	.544	.587	.992	1.008
2	(Constant)	.808	.227		3.560	.000		
	Computerized Accounting Systems	.657	.064	.599	10.340	.000	.973	1.028
	Accidental Destruction of data	.022	.052	.025	.432	.666	.991	1.009
	INTERACTION	.115	.024	.283	4.893	.000	.981	1.020

a. Dependent Variable: Audit Risk Management

The significant interaction indicates that the presumed moderator (accidental destruction of data) does actually moderate the influence of the predictor (computerized accounting systems) on the outcome variable (public enterprise audit risk management). The hypothesis that accidental destruction of data moderates the relationship between computerized accounting systems and public enterprises audit risk management was therefore supported. As a result, the hypothesized moderation model was therefore confirmed to be;

Y = 0.808 + 0.599X + 0.025Z + 0.283XZ

The model implies that a unit change in standard deviation of the interaction will result in 0.283 standard deviations variance in audit risk management of public enterprises. This applies to accidental destruction of data and the interaction term. The study recognized earlier attempts to find out the reason for the mixed results as above and identified limited studies that advanced possible mediator influence (Peterson *et al.*, 2010; Henry, 2007) but which were inconclusive as they did not justify having hypothesized the mediators (ERP environment and audit control mechanisms) nor did they test for direct effects. The Based on the works of Coffin and Patilis, 2001; Wright, 2012 that report prediction of audit risk management by accidental destruction of data, this study hypothesized and confirmed moderation of accidental destruction of data in the relationship between computerized accounting systems thereby adding new knowledge in the quest for the reason for the inconclusive results posted by this causal relationship. This study therefore provides insight into this elusive explanation. The finding regarding the moderating effect of accidental destruction of data on the relationship between computerized accounting systems and audit risk management is a significant contribution of the current study to existing literature.

Conclusion:

The study analyzed the influence of accidental destruction of data on the relationship between computerized accounting systems and audit risk management. It hypothesized and confirmed that accidental destruction of data moderate the relationship between computerized accounting systems of these firms. Using hierarchical multiple regression analysis, the study established that accidental destruction of data moderated the relationship between computerized accounting systems and audit risk management. The change in R^2 when the interaction between computerized accounting systems and accidental destruction of data was added to the regression was found to be significant confirming the moderation effect. Therefore, accidental destruction of data indeed amplifies the relationship.

From the finding it can be concluded that accidental destruction of data indeed moderate the relationship between computerized accounting systems and audit risk management. The study contributes to knowledge by advancing a moderation model (**Y = 0.808 + 0.599X + 0.025Z + 0.283XZ).** In this model, for every unit of variation in audit risk management, moderation of accidental destruction of data contributes 28.3%. In this respect, it provides an explanation to the earlier contradicting results on effect of computerized accounting systems and audit risk management. The study used all the constructs of each variable increasing the validity of the results. From the study conclusion that accidental destruction of data in deed moderates the relationship between computerized accounting systems and audit risk management, it is recommended that accidental destruction of data should be emphasized by the public firms as it amplifies the prediction of computerized accounting systems on their audit risk management. It is observed that computerized accounting systems and accidental destruction of data play a role in improving audit risk management of the public firms.

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