

FACTORS ASSOCIATED WITH ATTRIBUTES OF INTERNAL AUDIT DEPARTMENTS: A CANONICAL ANALYSIS

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ABSTRACT

This study explores internal audit (IA) practices in selected Ethiopian organizations to identify factors associated with attributes of IA departments. Analytical questionnaire survey responses of 188 IA directors and staff from Ethiopian government ministries, state-owned enterprises and private companies were used. Canonical analysis results show that IA proficiency, scope of IA work and quality of IA planning and execution are higher in organizations where organizational policy authorizing IA is clearly defined, organizational risk exposure is high and internal audit's linkage with external audit is strong. The findings suggest that in organizations that are exposed to high risk, management tends to appreciate IA's assistance in managing risk and thus strengthens IA. Results also suggest the importance of internal and external audit linkages and IA charter (or similar organizational policy) to strengthen IA. The study provides further evidence of differences in IA attributes between public and private sector entities.

Keywords: Internal audit; internal audit context; corporate governance; canonical analysis; Ethiopia

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I. INTRODUCTION

Internal audit (IA) practices tend to have transformed over time mainly due to changes in the social, political, and economic settings (Spira

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and Page, 2003). In appreciation of this notion, research has been advocated to examine factors that are associated with attributes of internal audit (Anderson, 2003; J Goodwin, 2004; Mihret, James, and Mula, 2010; Ruud, 2003). In response to this felt need for research, this study empirically examines the association of IA attributes with some context factors using analytical survey responses of internal audit directors and staff of selected Ethiopian government ministries, state-owned enterprises and private companies. The limited prior research on IA apparently considered IA's context factors in isolation, and specific attributes of IA have largely been treated as a single uni-dimensional construct. As a result of using this approach, aspects of IA attributes were aggregated by using proxy measures (Mihret et al., 2010). Against this background, the present study employs canonical analysis, which enables considering the multi-dimensional nature of IA attributes and taking into account a set of IA context factors as well as the interactions within the set.

The paper is structured as follows. The next section reviews the literature and develops hypotheses. Section three describes data collection procedures and outlines the research methods employed. Section four reports empirical results of the study; and finally, section five concludes the paper.

II. LITERATURE REVIEW AND HYPOTHESIS

A. Attributes of Internal Audit

The existing internal audit literature (for example, Al-Twajjry, Brierley, and Gwilliam, 2003; Mihret and Woldeyohannis, 2008) employs standards for the professional practice of internal auditing (SPPIA) to assess attributes of internal audit departments. Compliance with SPPIA has also been employed as indicator of IA effectiveness and value added (Al-Twajjry et al., 2003; Mihret et al., 2010; Mihret and Woldeyohannis, 2008). This approach enables comprehensively assessing the characteristics of IA departments because it helps cover IA's independence and objectivity, proficiency and scope and quality of work.

Independence and Objectivity Raghunandan and Mchugh (1994) consider independence and objectivity as attributes of effective IA departments. Objectivity is considered essential for internal auditors' proper discharge of responsibilities (Christopher, Sarens, and Leung, 2009). Reporting to and having frequent meetings with audit committees contribute to internal auditors' objectivity (Cohen, Krishnamoorthy, and Wright, 2004; Jenny Goodwin and Yeob, 2001; Mat Zain and Subramaniam, 2007; Raghunandan and Mchugh, 1994; Scarbrough, Rama, and Raghunandan, 1998). Internal auditors' objectivity is also enhanced when

boards of directors retain the authority to hire and fire IA directors (Raghunandan and Mchugh, 1994) and when they review IA's plans and performance (Scarbrough et al., 1998).

IA Proficiency Technical competence and continuous training are considered essential characteristics of effective IA departments. Consistent with this notion, Gramling and Meyers (1997) find that certification of internal auditors is perceived as an indicator of IA competence. Further, internal auditors cannot have power unless they possess the necessary knowledge and experience (Al-Twajiry et al., 2003). As contemporary IA involves a broad scope of activities, IA departments need to employ internal auditors with a variety of skills to be able to undertake audits beyond financial activities (Flesher and Zanzig, 2000; Mihret and Woldeyohannis, 2008).

Scope of work and performance The scope and quality of internal audit work is another indicator of IA departments' attributes. The breadth of internal audit's scope of work and the standard with which the audits are planned, executed and reported are important illustrations of effective IA (Al-Twajiry et al., 2003; Albrecht, Howe, Schueler, and Stocks, 1988).

B. Factors associated with attributes of IA

The literature indicates that the attributes of internal audit departments are influenced by the contextual dynamics within which IA is practiced (Al-Twajiry et al., 2003; Allegrini, Paape, Meville, and Sarens, 2006; Hass, Abdolmohammadi, and Burnaby, 2006; Mihret and Woldeyohannis, 2008). Hass, Abdolmohammadi and Burnaby's (2006) review of the American internal auditing literature indicates that the issuance of the Sarbanes Oxley Act (2002) has lead internal audit to re-emphasize assurance services as compared to the growing consulting services of IA. Consistent with this notion, Arena, Arnaboldi and Azzone (2006) indicate that in companies to which strict regulations apply, internal audit focuses on checking compliance of companies with regulatory requirements. Nonetheless, detailed investigations of the attributes of IA with inter-sector comparisons, aiming to explore variables associated with variations across organizations, are limited.

Goodwin (2004) compared IA in public and private sector organizations in Australia and New Zealand. She reported that IA's status and the tendency to outsource IA are greater in the public sector. Goodwin found little differences in IA activities and the extent of IA's interactions with external auditors in the two sectors, and she attributed this result to the similarity of the two sectors' contexts due to public sector reforms in the two countries. This suggests the need for researching related issues in different settings—where the two sectors exhibit variations. Studies in

other settings arguably help identify country- and organization-level contextual factors associated with attributes of IA.

Organizational category The objectives, operating practices and stakeholders of organizations could vary across sectors because different institutional pressures may apply in different sectors. For example, Jacobs (1998) suggests that the application of value for money audits is influenced by institutional context. The type of business in which a company is engaged may also influence the type of internal control and the extent of professional advice that IA provides to management (Mihret and Woldeyohannis, 2008). As a result, the services required from internal auditors may differ by type of business. Goodwin (2003) highlights some differences in the relationship between IA and audit committees across sectors. Propensity to outsource IA and related issues are also likely to vary across sectors (J Goodwin, 2004).

Company size As the size of an organization increases, the complexity of the necessary organizational controls as well as the regulatory requirements imposed on it are likely to increase. Increased complexity and regulation could engender greater demands from internal audit regarding IA's services in regard to the control systems of organizations (Arena et al., 2006). Audit committees are likely to make reviews of IA findings in large companies, and such companies are likely to allocate more resources to IA departments (Carcello, Hermanson, and Neal, 2002). Organizational size is associated with the variables that could impact on IA independence and objectivity (Jenny Goodwin and Yeob, 2001) and thus, size is positively associated with the strength of internal control systems (Raghunandan and Mchugh, 1994).

Risk exposure When organizations are exposed to high risk, management's demand for IA in the management of risk may be greater (Felix, Gramling, and Maletta, 2001; Mihret et al., 2010). IA's focus on risk management in turn enables it to align its plans with organizational goals and strategies (Selim and McNamee, 1999). As different organizations are apparently exposed to different levels of risk, the demand for IA services could vary accordingly (Arena et al., 2006).

Management support, auditee cooperation, and organizational policy Management support to IA is considered as one of the determinants of IA's attributes (Mihret and Yismaw, 2007). This support could, for instance, be in the form of allocating adequate human and material resources to IA. Organizational policy authorizing IA (for example, IA charter) is another potential influence that is closely related to management support to IA and auditee cooperation with the internal auditors (Mihret and Yismaw, 2007). The level of auditee cooperation in turn influences IA's extent of properly accomplishing its objectives (Al-

Twaijry et al., 2003; Mihret and Yismaw, 2007). Management also determines the overall policy setting that helps IA garner authority in the organization and thus gain auditees' acceptance (Mihret et al., 2010).

Internal and external audit linkages External audit impacts on the development of IA. Rittenberg and Covaleski (2001) analysed the dynamics underlying the issue of internalization versus externalization of IA. They argue that external audit and internal audit engage in volitional behaviour which leads each profession to redefine its roles to encompass IA activities. Furthermore, external audit assists the development of IA by serving as a market for recruitment of internal auditors (Al-Twaijry et al., 2003; Albrecht et al., 1988; Arena et al., 2006), and companies sometimes establish IA by initially outsourcing the function to external auditors (Carey, Subramaniam, and Ching, 2006). Furthermore, to determine the extent of their reliance on IA work, external auditors assess IA quality. Such reliance is an area where IA adds value to organizations through reduced external audit fees (Krishnamoorthy, 2002).

Overall, it can be seen from the literature that prior research has considered IA context factors and IA attributes in isolation. With a view to considering the factors and attributes in a more integrated way, this study aims to test the following hypotheses.

- H₁. The extent of internal audit's compliance with SPPIA is associated with organizational category, organizational size, organizational policy authorizing IA, organizational risk exposure, internal and external audit linkages, and auditee cooperation.*
- H₂. The extent of internal audit's compliance with SPPIA differs among government ministries, state-owned enterprises and private companies.*

III. DATA AND METHODOLOGY

A. The data and measurement

Analytical questionnaire survey of IA directors and staff was conducted with selected Ethiopian organizations. Items measuring internal audit attributes were mainly adapted from Al-Twaijry, Brierley and Gwilliam (2003) with permission from the corresponding author. Attempt was then made to enhance validity of the adapted questionnaire by considering the latest Institute of Internal Auditors' (2008) standards for the professional practice of internal auditors as well as other current literature. Thus, questionnaire items for IA attributes were stated using descriptors of SPPIA compliance and responses were measured using items with response options ranging from 'Strongly Agree' to 'Strongly Disagree' (Appendix 1, sections E and F) or 'Always' to 'Never' (Appendix 1, sections G to I). Context factors were measured on a five point Likert-type

scale with response options ranging from 'Strongly Agree' to 'Strongly Disagree' (Appendix 1, sections A to D).

To ensure validity of the data, the questionnaire was pre-tested at two stages. First, it was subjected to reviews by academic colleague. Second, to ensure clarity and understandability of items to actual respondents, the questionnaire was pilot tested with fifteen individuals who would otherwise have been potential participants. The questionnaire was revised based on the comments and suggestions received at each stage of the pre-testing before the actual data collection commenced.

B. The sample

Stratified purposive sampling was employed to ensure taking respondents from the three categories of organizations, that is state owned enterprises (SOEs)², government ministries³, and private sector companies⁴ in Ethiopia. This stratification was necessary as the second hypothesis requires comparison among these groups of organizations. Purposive sampling was used because organisations that have internal audit departments were to be included in the study. This approach is valid since the study was aimed at generating inferences about the relationships among the variables rather than deriving statistical generalizations about the population (Oppenheim, 1992). That is, the 'analytical' purpose of the survey requires having the right participants rather than aiming for randomization (Oppenheim, 1992, p. 21).

A total of 242 questionnaires were distributed, of which 193 were received and 188 were usable; this provides a usable response rate of 77.7 per cent. Forty eight respondents (25.5 per cent) were from government ministries, 87 (46.3 per cent) were from SOEs, and 43 (22.9 per cent) were from private companies. The sample comprised participants from organizations that employed 1 to 5 (n=57, 30.3 per cent), 6 to 10 (n=25, 13.3 per cent), 11 to 15 (n=11, 5.9 per cent), and over 15 (n=85, 45.2 per cent) internal audit staff. These organizations employed below 500 employees

² Ethiopian federal ministries were considered for the study, and there were 17 federal ministries at the time of data collection. Questionnaires were distributed to all internal audit directors and staff of the organizations that permitted their IA departments to participate in the study.

³ There were a total of 112 SOEs, out of which those categorized as big SOEs by the Ethiopian government were taken from the register maintained by the Ethiopian Privatization and Public Enterprises Supervisory Authority.

⁴ As there is no stock exchange in Ethiopia, private companies in the insurance and banking sectors were the only private sector entities that maintained IA since other private sector companies were small-sized. Accordingly, only 15 companies were considered from this category and questionnaires were distributed to all IA directors and staff of those companies.

(n=51; 27.1 per cent), 501 to 1000 employees (n=49; 26.1 per cent), 1001 to 3000 employees (n=47; 25 per cent), 3001 to 5000 employees (n=13; 6.9 per cent), 5001 to 8000 employees (n=8; 4.3 per cent), and over 8000 employees (n=10; 5.3 per cent).

The sample comprised 136 male (72.3 per cent) and 41 female (21.8 per cent) participants; eleven participants did not provide responses to the gender item. The age distribution ranged from 20-30 to over 60 years. The sample was composed of junior auditors (n=29, 15.4 per cent), auditors (n=48, 25.5 per cent), senior auditors (n=27, 14.4 per cent), audit managers (n=13, 6.9 per cent), and internal audit directors (n=24, 12.8 per cent); forty-seven participants did not answer the job title question. This is possibly because the job title descriptors in the questionnaire do not exactly fit with the job titles in some organizations. During the data collection visits it was understood that titles like *internal audit department head*, *internal audit process owner*, and *inspector* were used in some organizations.

Forty-seven (27.6 per cent) participants had 1-3 years of experience; 54 (31.6 per cent) had 3-6 years of experience; 33 (19.4 per cent) had 6-9 years of experience; 16 (9.4 per cent) had 9-12 years experience; 10 participants had 12-15 years experience; and 11 (6.6 per cent) had over 15 years experience. Most of the participants had bachelor's degrees (n=125, 66.5 per cent) followed by college diploma (n=38, 21.1 per cent); the rest held masters degrees (n=10, 5.6 per cent) and vocational school certificates (n=7, 3.9 per cent). Twenty-three participants (25 per cent) were certified internal auditors (CIA), certified public accountants, certified management accountants, or held other certifications related to IA. Sixteen participants (41 per cent) were in progress for professional certifications. The participants had accounting (n=128, 70.7 per cent), management (n=22, 12.2 per cent), economics (n=17, 9.4 per cent), and information technology (n=14, 7.7 per cent) backgrounds.

IV. EMPIRICAL RESULTS

A. Data reliability and normality tests

Reliability analysis was conducted for items under context factors using Cronbach's alpha because a Likert-type scale generates data that approximates an interval scale. Items that could improve Cronbach's alpha if excluded were deleted. As a result, one item was deleted from: *Organizational policy authorizing IA*, *auditee cooperation*, and *organizational risk exposure* constructs each. After deletion of those items, computed alphas were 0.861, 0.623, 0.546 and 0.772 for *Organizational policy authorizing internal audit*, *auditee cooperation*, *organizational risk exposure*, and *internal-external audit linkages* respectively. The alphas were considered

high enough to take the data as reliable since most researchers use 0.70 as a minimum acceptable level of coefficient alpha and still others consider 0.6 and 0.5 as sufficient (Kerlinger and Lee, 2000). Inter-item correlations were also computed for all variables. These measures were employed to assess reliability for variables that were measured using ordinal scales, with responses ranging from 'Always' to 'Never'. Most of the inter-item correlations were greater than 0.30, which suggests data reliability. The high linear correlations (Table 1) among most variables also showed that homoscedasticity was not a threat in testing the first hypothesis using canonical correlation.

Table 1. Spearman's inter-item correlations for variables with ordinal measure

	IA proficiency	IA Independence and Objectivity	Scope of IA work	Quality of IA planning and execution	Quality of IA Reporting and Follow-up	Organizational policies authorizing IA	Auditee cooperation	Organization risk exposure	Internal-external audit linkages
IA proficiency	1.00								
IA independence and Objectivity	.761*	1.00							
Scope of IA work	.452*	.405*	1.00						
Quality of IA planning and execution	.429*	.388*	.523*	1.00					
Quality of IA reporting and Follow-up	.308*	.333*	.373*	.451*	1.00				
Organizational policies authorizing IA	.459*	.349*	.426*	.351*	.270*	1.00			
Auditee cooperation	.318*	.097	.255*	.187*	.131*	.263*	1.00		
Organization risk exposure	.259*	.144*	.236*	.277*	.209*	.236*	.308*	1.00	
Internal-external audit linkages	.299*	.268*	.324*	.310*	.283*	.254*	.154*	.213*	1.00

*significant at 0.05 level

Furthermore, normality of distributions was tested for these variables. *Auditee cooperation*, *Independence and objectivity* and *Reporting and Follow-up* exhibited non-normal distributions (identified by skewness and/or kurtosis out of the range of +1 and -1). LNgamma transformation for *Reporting and follow-up* and *Auditee Cooperation*, and LN (numexpr) for *Independence and Objectivity* generated normally distributed data. These

methods are frequently used in data transformation (Hair Jr., Anderson, Tatham, and Black, 1998).

B. Test of Hypotheses

H₁. The extent of internal audit's compliance with SPPIA is associated with organizational category, organizational size, organizational policy authorizing internal audit, organizational risk exposure, internal-external audit linkages, and auditee cooperation.

The extent of internal audit compliance with SPPIA was measured by *internal audit proficiency, Independence and objectivity, Scope of work, Quality of audit planning and execution, and Quality of audit reporting and follow-up*. Canonical analysis is an appropriate statistical technique to test this hypothesis because it involves an association between two groups of multiple variables in which some of the variables were measured at ordinal or nominal level (Hair Jr. et al., 1998). Stevens (2002) suggests a minimum subject-to-variable ratio of 20-to-1, when only one canonical function is significant, in order to obtain a reliable statistical result. Hair et al. (1998, p. 447) recommends a minimum of 10 observations per variable to avoid 'overfitting' of the data. The total usable response of 188 provides observation-to-variable ratio of above 31-to-1 for both sets of variables. Thus, the response is considered sufficient to generate valid canonical correlation results.

Results of testing the overall model fit for canonical correlation analysis (Table 2) show that the canonical functions taken collectively are significant at the 0.01 level. This suggests a statistically significant fit of the first canonical function at 0.01 level.

Table 2. Measures of overall model fit for canonical correlation analysis

Test Name	Value	Approx. F	Hypoth. DF	Error DF	Sig. of F
Pillai's criterion	.63900	4.07831	30.00	835.00	.000
Hotelling's trace	1.06061	5.70610	30.00	807.00	.000
Wilk's lambda	.44582	4.87885	30.00	654.00	.000

Statistical significance of the other canonical functions was tested using Wilk's Lambda (Table 3). The analysis shows that there were five canonical correlation functions as the lower of the number of IA attributes and context factor variables is 5. The first function was significant at a 0.01 level; whereas, the second was significant at 0.10.

Table 3. Dimension Reduction Analysis

Roots	Wilks L.	F	Hypoth.		Canonical	Squared		Sig. of F
			DF	Error DF	Correlation (rc)	canonical correlation	Eigenvalue	
1 To 5	.44582	4.87885	30.00	654.00	.68199	.46511	.86956*	.000
2 To 5	.83348	1.53802	20.00	544.88	.34154	.11665	.13205**	.063
3 To 5	.94354	.80842	12.00	436.84	.19324	.03734		.642
4 To 5	.98014	.55770	6.00	332.00	.13218	.01747		.764
5 To 5	.99757	.20318	2.00	167.00	.04927	.00243		.816

Pooled R²= 0.639

* 0.86956 = 0.46511/(1 - 0.46511); **0.13205 = 0.11665/(1 - 0.11665)

Canonical correlation (r_c) for the first function (that is, the correlation between the first pair of canonical variables) is 0.6819. This represents the highest possible correlation between any linear combinations of the two sets of variables. Similarly, canonical correlation between the two sets of variables of the second function is 0.3154. Thus, taking the squared canonical correlations, the covariates (that is, independent canonical variables) explain 46.511 per cent and 11.665 per cent of the variations in the dependent canonical variables in function 1 and function 2 respectively. This makes 58.27 per cent in total for the two functions.

Pooled R², which is the total variation in the set of dependent variables associated with the variations in the set of independent variables, is 0.639. This indicates that 63.90 per cent of the variance between the two sets of variables is shared. This measure shows the shared variability in the canonical variates rather than in the original variables (Sheskin, 2007). Eigenvalues, the ratio of variance in the dependent variables explained by the changes in the independent variables to the variance not explained by these changes, is about 87 per cent for the first function and 13 per cent for the second. In both cases, the unexplained variances exceed the explained variances, although the association between the two sets of variables is statistically significant at a 0.01 level for the first function and at a 0.10 level for the second. Sheskin suggests that canonical functions could be considered as having some value when they have canonical correlation of arbitrarily 0.30 or above. Yet, only the first canonical function is further interpreted in this study because it is the only function significant at a 0.05 level. The relative importance of each variable in the first canonical function is evaluated next.

Standardized canonical coefficients (Table 4) are used to interpret the relative importance of the variables in the function because the raw canonical coefficients cannot be used since measurements in the original variables in this

study are not uniform. That is, nominal, ordinal, and ratio scale data were collected based on the nature of the variables. The standardized canonical coefficients are based on standard deviations and the absolute values of the standardized canonical coefficients are used to interpret the relative importance of each variable (Sheskin, 2007). These coefficients are used to formulate the optimal linear combination of the dependent and independent variables resulting from canonical analysis.

Table 4. Standardized canonical coefficients

Variate	Variable	Function 1
Dependent	IA proficiency	-.72986
	IA Independence and objectivity	.25041
	Scope of IA work	-.37655
	Quality of IA planning and execution	-.26900
	Quality of IA reporting and follow-up	-.05507
Independent	Organizational Category	.29095
	Organizational Size	-.13130
	Organizational policy authorizing IA	-.46584
	Auditee cooperation	-.30294
	Organizational risk exposure	-.33509
	Internal-external audit linkages	-.36232

The standardized canonical coefficients' of the canonical function for the dependent variables (Table 4) show that *IA proficiency* is the most significant variable in defining the canonical function followed by *Scope of IA work*, *Quality of IA planning and execution*, and *IA independence and objectivity* in that order; whereas *Reporting and follow-up* was the least importance. Independence and objectivity have a positive coefficient while the rest of the variables have negative coefficients. This indicates that Independence and objectivity exhibit an inverse relationship with the other variables. This relationship is not supported by existing theory; however, it may be a result of the fact that canonical correlation sometimes provides results that are not easily interpretable (Sheskin, 2007). Thus structure correlations that are considered as the most interpretable canonical results are discussed later.

For the independent variate, organizational policy authorizing IA was the most important variable in the function, followed by Organizational risk exposure, Auditee cooperation, Organizational category and Organizational size in that order. Another result is that Organizational category (nominally measured

as ministry, state-owned enterprise or private company) had a positive coefficient whereas the rest of the variables had negative coefficients. This implies that there is an inverse relation between organizational category and the rest of the independent variables in the canonical function, providing further support for the need to test the second hypothesis.

Structure correlations were examined to further assess the relative importance of each variable in defining the canonical function. Sheskin (2007) suggests that structure correlations are the most interpretable weights in canonical analysis. These are the correlations between each individual variable and the relevant canonical variates, compared to the standardised canonical coefficients, which are analogous to partial correlations (Sheskin, 2007).

As the absolute values of the structure correlation coefficients indicate (Table 5), *IA proficiency*, *Scope of internal audit work*, and *Quality of IA planning and execution* are the most significant variables in the function. The structure correlations for all the individual variables are negative, which indicates that the variables are positively correlated to each other. Under the independent variate, *Organizational policy authorizing IA*, *Organizational risk exposure* and *internal-external audit linkages* are the most significant variables. The coefficients of all the variables except Organizational category have similar signs, which suggest that these variables are positively associated. In addition, only organizational category has a positive coefficient, further suggesting the need to examine its impact on the other variables (and this is the focus of H₂). All variables have structure correlations greater than 0.30 except Organizational category and Organizational size. This shows that the variables are significant in defining the canonical function.

Table 5. Structure Correlations for function 1

		Function 1
Dependent Variate	IA proficiency	-.85424
	IA Independence and objectivity	-.55094
	Scope of IA work	-.79085
	Quality of IA planning and execution	-.70902
	Quality of IA reporting and follow-up	-.47141
Independent Variate	Organizational Category	.15792
	Organizational Size	-.27767
	Organizational policy authorizing IA	-.77461
	Auditee cooperation	-.52247
	Organizational risk exposure	-.57468

Internal-external audit linkages -0.56829

As a final procedure, practical value of the canonical function is assessed through redundancy analysis (Table 6). The dependent canonical variates have a redundancy index of 22.72 percent and the independent canonical variate has 12.62 per cent. Overall, subject to the exploratory nature of canonical analysis, all the assessments suggest that the canonical function is significant. Thus, the hypothesis that *the extent of internal audit's compliance with SPPIA is associated with organizational category, organizational size, organizational policy authorizing IA, organizational risk exposure, internal-external audit linkages, and auditee cooperation* is supported.

Table 6. Redundancy Analysis

Variate/Variable	Canonical Loadings ^a	Canonical loading squared ^c	Average Loading Square	Canonical R ²	Redundancy index
<i>Dependent variable</i>					
IA proficiency	-0.85424	0.729726			
IA Indep. and objectivity	-0.55094	0.303535			
Scope of IA work	-0.79085	0.625444			
Quality of IA planning and execution	-0.70902	0.502709			
Quality of IA reporting and follow-up	-0.47141	0.222227			
Dependent Variate		2.383641	0.476728	.46511 ^c	0.22726971 ^d
<i>Independent variable</i>					
Organizational Category	0.15792	0.024939			
Organizational Size	-0.27767	0.077101			
Organizational policy authorizing IA	-0.77461	0.600021			
Auditee cooperation	-0.52247	0.272975			
Organizational risk exposure	-0.57468	0.330257			
Internal-external audit linkages	-0.56829	0.322954			
Independent Variate		1.628246	0.271374	.46511	0.12621888

a. Canonical loadings are the correlations between variables and canonical functions; b. $0.553 = 2.2383641/5$; b. See Table 3; c. $0.222 = .553 \times .402$

H₂. *The extent of internal audit's compliance with SPPIA differs among government ministries, state-owned enterprises and private companies.*

To test this hypothesis, IA attributes were converted into a single variable in two steps. First, the median values of item responses for each of the context factors were taken. Then, the median of all the five was taken. This procedure was followed instead of calculating an overall median because it helps ensure that the responses to items under each factor are represented. Thus all factors are represented in the combined measure of internal audit attributes regardless of the number of items under each factor. Kruskal Wallis test was then run to test the differences because the data was ordinal in nature. Mean ranks are highest for SOEs, followed by Government ministries and Private companies in that order (Table 7). The differences are also statistically significant at the 0.05 level ($\chi^2 = 6.07$, sig. 0.048). This shows that SOEs exhibit the highest IA attribute scores followed by government ministries and private companies.

Table 7. Inferential statistics results for H₂

	Organization category	N	Mean Rank
IA Attributes	Government ministries	48	89.91
	State-owned enterprise	86	95.61
	Private company	42	72.33
	Total	176	

Test Statistics ^{a, b}	
	IA Attributes
Chi-Square	6.070
Df	2
Asymp. Sig.	0.048

Kruskal Wallis test was also repeated for each component IA attributes. For the first three dimensions, mean ranks are highest for SOEs followed by government companies and private companies (results not presented). On the other hand, for Planning and execution and Reporting and follow-up, government ministries have the highest mean rank, followed by state-owned enterprises and private companies. The differences are, however, statistically significant at a 0.05 level only for Internal audit proficiency and Independence and objectivity. Overall, Kruskal Wallis test results indicate the hypothesis that *the extent of internal*

audit's compliance with SPPIA differs among government ministries, government companies and private companies is also supported.

V. CONCLUSION

This study has explored the association of internal audit (IA) attributes with context factors. Analytical questionnaire survey of IA directors and staff from selected Ethiopian government ministries, state-owned enterprises and private companies was used. Results show that *IA proficiency, scope of IA work and quality of IA planning and execution* are higher in organizations where *organizational policy authorizing IA* is clearly defined, *organizational risk exposure* is high, and *internal and external audit linkages* are strong. The findings suggest that in organisations that are exposed to high risk, management tends to appreciate IA's assistance in managing risk and strengthen IA. Results also suggest the importance of linkages between internal and external audit and of IA charter (or similar policy) to strengthen IA. Furthermore, the results provide further evidence of differences in some attributes of IA between public and private sector entities.

The results are consistent with arguments in the extant literature. The association between IA context and IA attributes is consistent with the interview evidence provided by Arena, Arnaboldi and Azzone (2006) on Italian companies. The significance of the risk exposure variable in the model is also consistent with Spira and Page's (2003) observation that the level of risk faced by organisations helps transform the role of IA. Also, the results on differences in key IA attributes among public and private sector entities are in line with arguments in the literature.

This study is the first to employ canonical analysis for a study of IA attributes. Fornell and Lacker (1980) advocated this technique in accounting research because it enables considering interrelationships that exist within sets of dependent and independent variables. It enables researchers to study IA attributes as a multi dimensional construct while at the same time considering the interrelationships that exist among the dimensions. Some avenues for further research can be suggested based on the results of this study. One possibility is to replicate this study in different settings to validate the conclusions. Another fruitful avenue could be to test the association of IA attributes with organisational performance to identify the value adding potential of IA.

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APPENDIX 1: Items in the Questionnaire

A. Organizational policy authorising internal audit

1. The purpose of internal audit is clearly defined.
2. The purpose of internal audit is in line with "Standards for the Professional Practice" formulated by the Institute of Internal Auditors.
3. The authority of internal audit is clearly defined.
4. The authority of internal audit is in line with "Standards for the Professional Practice" formulated by the Institute of Internal Auditors.
5. The document defining internal audit's purpose and authority is approved by board of directors (or audit committee).

B. Auditee Cooperation

1. Internal auditors have full access to records and information they need in conducting audits.
2. Internal auditors receive full cooperation from auditees (units being audited).
3. Auditees regard internal audit as a value-adding service.

C. Risk Exposure of the organization

1. There are adequate internal controls in the organization at large.
2. Frequency of transactions involving cash is high.
3. The organization has large amount of receivables.
4. The organization has large amount of inventories.
5. There are enough employees to carry out tasks in the organization at large.
6. Competence of employees is high in the organization at large.
7. The organization's operations are complex.

D. Internal-external audit linkages

1. External auditors make recommendations that help improve internal audit.
2. External audit reports help enhance managements' acceptance of internal audit findings.
3. Internal audit follows up implementation of external auditor's recommendations on improvement of internal control systems.
4. External auditors use internal audit reports in conducting their audit.
5. External auditors use internal audit working papers in conducting their audit.

E. Proficiency of Internal Audit

1. The internal audit department is large enough to successfully carry out its duties.
2. Internal audit obtains a sufficient budget to successfully carry out its duties.
3. Internal auditors possess sufficient experience to understand the organization's systems.
4. The internal audit staffs possess knowledge and skills in a variety of areas (beyond accounting and finance), as necessary.
5. Internal audit has policies for hiring internal audit staff.
6. Internal audit has policies for training of internal audit staff.
7. Internal auditors undertake continuous professional development activities (such as professional association sponsored programs and correspondence courses).
8. Adequate short-term training is arranged for internal auditors each year.
9. There is a complete internal audit manual to guide internal audit work.

F. Independence and Objectivity of Internal Audit

1. Internal audit is free from intervention in performing its duties.
2. Internal auditors feel free to include any audit findings in their audit reports.
3. Internal audit provides reports to the board of directors (or audit committee).
4. The board of directors (or audit committee) oversees employment decisions in internal audit.
5. Internal auditors are not assigned to audit areas in the system design of which they participated.
6. Internal auditors do not participate in audit of activities for the operation of which they were responsible.
7. Internal audit staff assignments are rotated periodically.

G. Scope of internal audit work

How often does internal audit conduct the following activities?

1. Checking adequacy of the auditees' record keeping when appropriate.
2. Verifying accuracy of amounts in financial records.
3. Reviewing information contained in reports of operating departments.
4. Reviewing the systems for safeguarding of asset.
5. Evaluating the internal control system.
6. Performing audit of major fraud cases.
7. Checking efficiency of operating results (e.g. whether cost saving alternatives are used).
8. Ascertaining compliance with organizational policies and procedures.
9. Checking compliance with contracts when applicable.
10. Checking compliance with external laws and regulations when applicable.
11. Ascertaining that operating objectives are consistent with organizational goals.

12. Ascertaining that operating procedures are consistent with the operational goals.
13. Reviewing operations to ascertain they were implemented as intended.
14. Assisting the management by identifying risk exposures of the organization.
15. Providing consulting services to management where internal audit has the expertise.

H. Audit Planning and Execution

1. Annual internal audit plan is prepared.
2. Risk assessment is done as part of audit planning.
3. Fraud risk is considered in setting audit priorities.
4. Senior management input is considered in setting internal audit priorities.
5. A preliminary survey is conducted before an audit
6. During the examination of audit evidence, analytical audit procedures (e.g. ratios, trends, etc.) are used as appropriate.
7. Audit work is documented and maintained in a file of audit working papers.
8. In setting up audit programs:
 - The objectives and goals of the activities to be audited are reviewed
 - potential risks relevant to the activity to be audited are identified
 - prior audit reports are reviewed
 - prior audit working papers are reviewed
 - preliminary communication is made with auditees
 - the resources necessary to perform the audit are reviewed
 - reports by other agencies, where applicable, are obtained
 - audit objectives are established
 - written audit programs are established

I. Reporting, follow-up and quality review

1. An internal audit supervisor (or manager) supervises field work.
2. An internal audit supervisor (or manager) reviews internal audit working papers.
3. Audit findings are discussed with auditees before being reported on.
4. Internal auditors follow up implementation of corrective actions relating to audit findings.
5. The reporting level varies with the importance of internal audit findings.
6. Corrective action plan is agreed with management before the report is issued.
7. Management takes timely corrective action based on internal audit recommendations.
8. How often are the following included in the internal audit reports?
 - The audit purpose and scope
 - the audit findings and conclusions
 - audit recommendations
 - auditees' comments regarding audit findings