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Factors Affecting the Internal Audit Effectiveness of Steel Enterprises in Vietnam

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Abstract

This article provides empirical evidence on factors of internal audit (IA) characteristics affecting the internal audit effectiveness in steel enterprises in Vietnam. The study uses data from survey obtained from 114 responses representing owners, managers, and internal auditors from 38 steel enterprises in Vietnam for period from 2018 to 2019. Data collected is firstly checked with Cronbach's Alpha, then the EFA test, and the model linear regression is used to test the relationship between internal audit characteristics and internal audit effectiveness. Results reveal that internal audit effectiveness in steel enterprises in Vietnam is influenced by various internal factors, including the size of internal audit, the scope of internal audit, the capacity of internal auditors, the independence of internal auditor, and the operational bases and methods of internal audit. Based on the research results, the paper makes six recommendations: strengthening operational basis of IA; increasing the independence of IA; increasing the size and capacity of IA staff; expanding and not underestimate the scope of IA; and reforming the internal governance structure. These proposed recommendations could be applied, not only for steel companies in Vietnam, but also for other companies in Vietnam or other companies in jurisdictions that have similar conditions.

Keywords: Internal Audit, Internal Audit Effectiveness, Steel Enterprises, Vietnam

JEL Classification Code: M40, M41, M42

1. Introduction

Internal audit (IA) plays an increasingly important role in risk management and corporate governance, especially in the current complex global context. As a heavy industry, Vietnam steel enterprises are diversified and have relatively high levels of operational, financial, technology and legal risk. Therefore, steel enterprises need IA as a powerful tool to support corporate governance, internal control and risk management to increase value and achieve operational goals. However, the number of Vietnamese steel enterprises

with IA is small, while internal audit effectiveness (IAE) in these entities is not highly appreciated.

This study seeks to determine the factors affecting IAE in Vietnamese steel enterprises, and factors governing IAE in those enterprises. Based on the research findings, this paper proposes constructive solutions aimed to enhance IAE in the steel enterprises of Vietnam.

2. Literature Review

2.1. Effectiveness of Internal Audit

According to the Institute of Internal Auditors (IIA) in the International Professional Practice Framework for IA (IPPF), internal audit is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes (IIA, 2016a). IA is responsible for strengthening management discipline, determining the reliability, reality and completeness of financial information and operations of enterprises, thus, making a great contribution to the

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achievement of goals and successful operation strategies of businesses.

IAE is a new and complex concept in research on IA (Dellai & Omri, 2016). IA is believed to be effective when it really contributes to creating added value for organizations (Mihret, James, & Mula, 2010; Hazaea, Tabash, Khatib, Zhu, & AL-Kuhali, 2020) by helping organizations management; evaluating and improving effectiveness of risk management, internal control and governance processes (Gramling, Maletta, Schneider, & Church, 2004; Hass, Abdolmohammadi, & Burnaby, 2006; Yee, Sujana, James, & Leung, 2008; Walter & Guandar, 2012) or helping organizations achieves its economic goals through implementing of recommendations by IA (Al-Twaijry, Brierley, & Gwilliam, 2003; Spira & Page, 2003). IA also contributes to improving the competitive advantages for enterprises by ensuring high-quality financial statements (Tamosiuniene & Savcuk, 2007; Hardi, Wiguna, Hariyani, & Putra, 2020; Nguyen, Ha, & Nguyen, 2020) because goals of IA are consistent with the responsibility of monitoring financial statements in the previous period (Goodwin & Yeo, 2001; Goodwin, 2003).

In Vietnam, Nguyen (2014) has clarified the term of IAE through synthesizing prior research and drawing the conclusion that IAE is a common direction toward a common goal, is the ability to achieve established goals or IAE, and is the auditor's ability to achieve goals built within an unit. This is completely consistent with previous studies such that IAE is the ability to achieve the results corresponding to the set goals (Arena & Azzone, 2009; Mihret, James, & Mula, 2010) or IAE is to gain goals of IA (Dittenhofer, 2001) or IAE is the degree-including quality-achieved compared to established targets (IIA, 2010). With the same viewpoint, Ismael (2013) concretizes and further develops the concept of IAE whereas IAE in enterprises is shown through the ability to monitor and improve internal control, risk management and governance process. Gramling, Maletta, Schneider, & Church (2004) and Sarens, De Beelde, & Everaert (2009) have the same approach. Once again, through the definition of IA (IIA, 2016), IA affirms the role of "creating added value, improving operations and supporting to fulfill goals of organizations", emphasizing the overall effectiveness of IA aspect in corporate governance, risk management and internal control.

From the above viewpoints, it is concluded that IAE is the ability of IA to achieve specified goals in monitoring and improving internal control, risk management and governance process that contributes to creating added value for businesses. IA does not only play an important role in audited units, but also the whole organization (Dittenhofer, 2001). It helps senior managers fulfill their governance responsibilities, allows the harmonization of stakeholders' interests and increases efficiency of the overall businesses (Radu, 2012).

2.2. Theory of The Internal Audit Characteristics

According to IIA (2016a) the IA characteristics in this study includes the size of IA, independence of IA, capacity of internal auditors, scope of IA, method of IA and operational basis of IA.

- **Scale of IA:** The IA scale is the number of internal auditors (Zain & Stewart, 2006; Arena & Azzone, 2009; Ismael, 2013; Alzeban & Gwilliam, 2014), including all personnel participating in IA activities in the enterprise. Depending on specific conditions of each enterprise, internal auditors may include specialized personnel and concurrent personnel, encompassing in-house and outsourcing personnel. In some cases, the size of IA is determined by the budget that an organization invests in IA activities (Yu, Hanchung, Rainbow, & Wuchun, 2019).

- **Professional capacity of IA:** Professional capacity is the most important attribute to measure the quality of audit skills (Prawitt, Smith, & Wood, 2009, 2012;). Professional capacity is measured by appropriate knowledge, skills, professionalism and experience of internal auditors. Professional competence is influenced by training and is measured by membership of IIA, possession of auditor's certificate, expertise trained and continuing education (Prawitt, Smith, & Wood, 2009; Arena & Azzone 2009; Sarens, De Beelde, & Everaert, 2009; Messier, Reynolds, Simon, & Wood, 2011; Ismael, 2013; IIA, 2016). The international standards of professional practice of the IPPF (IIA, 2016a) stated that: Professional proficiency is a term referring to the knowledge, skills and other professional competencies needed for auditors to perform his responsibilities effectively. The level of expertise includes IA reviewing current activities, trends and current issues to provide appropriate advice and recommendations (IIA, 2016a).

- **Scope of IA:** The scope of IA is the limitation on content, space and time within which IA performs functional activities to support corporate governance and add value to enterprises. The scope of IA content is the limit on types of IA including compliance audit, financial audit and operational audit. The spatial scope is essentially related to objects of IA, which can be the whole enterprise or some affiliated levels, divisions, departments in the enterprise; can be a series of activities, events or only an individual event, activity. The scope of time represents the duration of IA or the interval between internal audits - called the audit cycle. There may be incident audits, regular audits, periodically audits (Vu, 2016).

- **Method of IA:** Method of IA is studied by Ismael (2013) as one of the manifestations of the qualitative characteristics of IA. IA's techniques and approach method includes applying of risk-based IA plans, applying of information technology and continuous audit. The risk-based IA is derived from enterprise's goals to identify areas/regions/

divisions with the highest risk and the greatest impact on achievement of enterprises' targets and considered as the focus of IA (Griffiths, 2006). IA needs to apply information technology and perform continuous audits to strengthen risk management of enterprises, implement continuous risk control and assessment on an entire organization regularly, well exploit the benefits from automated audit tools such as audit software, calculate tools of data tests, pre-installed audit programs, support tools auditing aid, auditing techniques with computer aid (Dang, 2017).

• **Independence of IA:** IA independence is understood as the issue of performance, action and opinion of auditors not being affected or controlled by any party. Based on IPPF (IIA, 2016a), independence of IA is the fact that IA department is not bound by conditions that threaten the ability to perform IA's responsibilities in an impartial manner. In order to achieve the necessary degree of independence for implementing effectively IA responsibilities, the chief of IA has the right to directly and unrestricted access to the senior management board and the board of directors (IIA, 2016a). IA chief must report to the top level of administration so that it has sufficient authority to fulfill its responsibilities. IA department must not be interfered with in determining the work scope, performing its tasks as well as reporting its results (IIA, 2016a). Previously, Braiotta (1999), Goodwin and Yeo (2001) and Christopher, Sarens, and Leung (2009) agreed with IIA (2016a). They added that audit committee involvement in the appointment/dismissal of the chief IA helps strengthen and protects independence of IA.

• **Operational basis of IA:** Operating basis of IA is the foundation and prerequisite conditions for IA to perform functional activities in accordance with the definition of IA, the ethical rules and standards of IA. The basis of IA includes IA charter/regulations, risk-based audit plan, program of improving and ensuring the quality of IA (IIA, 2016; Sarens, De Beelde, & Everaert, 2009; Ismael, 2013). According to the IPPF (IIA, 2016a), IA rules and regulations clearly define the purposes, powers and responsibilities of IA and other related issues. IA plan is established based on risk assessment to identify IA priorities, consistent with the objectives of the organization, taking into account the risk management framework of the organization. IA quality assurance and improvement program is designed to allow assessment compliance of IA performance with the definition of IA as well as the evaluation criteria of IA.

3. Hypotheses, Research Model and Methods

3.1. Hypotheses

*** The effect of IA size (IAS) on IAE**

Size of IA is proven by many studies to affect the effectiveness of IA in enterprises. Some studies have tested

and obtained results showing that size of IA has a positive effect on IAE directly such as Arena and Azzone (2009); Ismael (2013); Yu, Hanchung, Rainbow, and Wuchun (2019). Other studies such as Zain and Stewart (2006); Alzeban and Gwilliam (2014); Yu, Hanchung, Rainbow, and Wuchun (2019) have also examined the effect of the size of IA. They found a positive relationship between this factor of IA and the role and quality of IA for financial statements audit, compliance and activities of enterprises, thereby indirectly affecting the effectiveness of IA. Therefore, the following hypothesis is formulated to test this relationship in the context of Vietnam's steel enterprises:

H₁: IAE in Vietnam's steel enterprises is positively related to the size of IA.

*** The effects of IA capacity (IAC) on IAE**

The factors constituting the internal auditor's capacity such as knowledge, skills and experience are important conditions for the auditor to perform their role well. They have been shown in previous studies, individually or synthetically, to have a relationship with the effectiveness of IA (Arena & Azzone, 2009; Sayag 2010; Ismael, 2013), as a decisive factor, an important decision on IAE. The appropriate level of competence of IA staff in terms of training, experience, knowledge and expertise has a positive effect on IAE (Al-Twajiry, Brierley, & Gwilliam, 2003). In particular, IA staff experience is said to have an important influence on the quality and role of IA (Al-Twajiry, Brierley, & Gwilliam, 2003; Vu, 2016; Yu, Hanchung, Rainbow, & Wuchun, 2019). Inversely, there are also authors who have not found a relationship between this factor and IAE (Zain & Stewart, 2006; Sarens, De Beelde, & Everaert, 2009). Skills are also a factor that has the potential to positively affect IAE (Sarens, De Beelde, & Everaert, 2009; Mihret, James, & Mula, 2010), but Sarens, De Beelde, and Everaert (2009) did not find an association between the two factors. Although there are some differences in previous studies, the positive relationship between the capacity of IA and IAE is expected in this study through the following hypothesis:

H₂: IAE in Vietnam's steel enterprises is positively related to the capacity of IA staff.

*** The influence of IA range (IAR) on IAE**

The range of IA is a factor surveyed and proved by some previous studies to have a significant effect on IAE (Ismael, 2013; Arena & Azzone, 2009). However, there are other research results with no relationship between scope of IA and IAE (Sarens, De Beelde, & Everaert, 2009; Mihret, James, & Mula, 2010). Usually, all pre-conduct audits need to be scoped in terms of content, space, and timing and be documented in the audit plan. It is important to determine an appropriate audit scope, even decisive

to the results of the audit. Scope of work is an important factor reflecting IAE with a broader scope allowing IA to support management in risk management, performance audit and traditional financial-compliance audit (Al-Twajry, Brierley, & Gwilliam, 2003; Albrecht, Howe, Schueler, & Stocks, 1988). With the inclusion of the scope of content, space and time mentioned above, IA range is expected to affect IAE positively. Therefore, the following hypothesis is established:

H₃: The more advanced and appropriate IA range, the higher IAE in Vietnam's steel enterprises.

*** The influence of IA method (IAM) on IAE**

IA should have an appropriate and effective audit approach and techniques to ensure that sufficient reliable and appropriate audit evidence is obtained; ensure that the auditor's analysis and assessment are comprehensive, and objective. By using risk-based approach, modern audit techniques, application of information technology and continuous audit, IA has ability to achieve its objectives. Therefore, IA's approach and techniques is a factor governing IAE. On the other words, appropriate and effective approaches are techniques to ensure IA achieves higher effectiveness. This was researched by Ismael (2013) who obtained clear results on the relationship between audit methods and IAE. Arena and Azzone (2009) found similar results. Against this background, we can formulate the following research hypothesis:

H₄: The more advanced and appropriate IA method, the higher IAE in Vietnam's steel enterprises.

*** The effect of IA independence (IAI) on IAE**

IA independence is one important principle that auditors must adhere to create quality and effectiveness of IA activities (Prawitt, Smith, & Wood, 2009). In an organization, IA is an internal monitoring function so that IA must be high independent to achieve its objectives effectively. Some studies have obtained results on positive effect of independence on IAE (Cohen & Sayag, 2010; Mihret, James, & Mula, 2010; Drogalas, Pazarskis, Anagnostopoulou, & Papachristou, 2015), even some considered IA independence as a key factor creating IAE. In contrast, Alzeban and Gwilliam (2014) did not obtain any statistically significant evidence for this relationship. Although there is a little difference in the review, this article expects a positive relationship between the independence of IA and the validity of IA in the enterprise. The following hypothesis is established:

H₅: IAE in Vietnam's steel enterprises is positively related to the IA independence.

*** The effects IA's operational basic (IAB) on IAE**

All activities of IA must be based on a certain basis. The basis of IA's operation is a system of frameworks, foundations and approaches for IA operations. International standards for the professional practice of IA (IIA, 2016b) states that: IA's regulations, processes and programs for assurance and assessment IA quality allow to assess compliance, effectiveness and efficiency of IA activities. Since then, the quality of the IAE has been improved and the IAE enhanced. Therefore, the advanced level, asymptotic to international practices of IA's operational basic is the premise for a higher level of IAE (Ismael, 2013; IIA, 2016b). These arguments lead to the following hypothesis:

H₆: The more complete IA's operational basis, the higher IAE in Vietnam's steel enterprises.

3.2. Proposed Research Model

Based on an overview study of the relationship between IA's characteristics and IAE, this paper builds a framework to test the impact of IA's characteristics on IAE in Vietnam's steel enterprises.

Each observed variable is measured through the survey participants' rating with a 5-point Likert scale, from 1-Totally disagree to 5-Totally agree. Variables and their scales in the model are shown in Table 1.

3.3. Research Method

A questionnaire was designed for collecting data from respondents. It contained five parts: Part A-Introducing the survey; Part B-Describing IA characteristics of the enterprise; Part C-Survey participants' views for each statement of items measuring the IA characteristics (internal auditors capacity, independence of IA, scope of IA, method of IA, and IA's operational basis); Part D-Survey participants' views for each statement of the items measuring IAE; and Part E-Respondents' information. Part B helps determine whether the enterprise has an IA. Respondents will answer all parts including Parts C and D if their enterprise has IA, otherwise respondents skip Parts C and D to move to Part E.

In 2018-2019, the steel industry in Vietnam consisted of about 1,000 enterprises operating at different scales. The study used the non-random method to get a sample of 193 enterprises. The survey results showed that only 38 enterprises out of 193 used IA. All 38 enterprises in the sample are joint stock companies. Carrying out the survey, each of the 38 enterprises selected three representatives including a representative of IA staff from internal auditors; a representative of administrative managers of IA as well as auditees (i.e., the board of executive or authorized person); a representative of the enterprise's owners (board of directors/ board of members/ company president or authorized person).

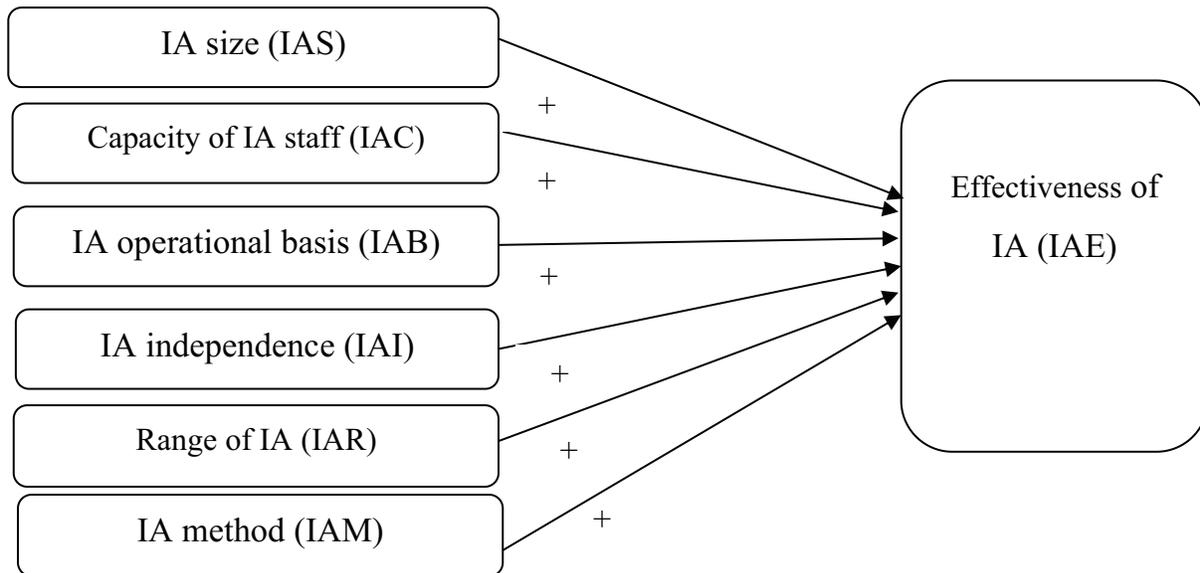


Figure 1: Research framework of influence of IA's characteristics on IAE

Table 1: Variables and their scales in the model

TT	Coding variables	Variables label	Measures and items	Expected	Resources
Independent variables					
1	IAS	Size of IA	Number of internal auditors	+	Zain and Stewart (2006); Arena and Azzone (2009); Ismael (2013); Alzeban and Gwilliam (2014)
2	IAC	Capacity of IA staff	- IAC1: Experience of internal auditor - IAC2: Skills of internal auditor - IAC3: Knowledge of internal auditor	+	Sarens, De Beelde, and Everaert (2009); Mihret, James, and Mula (2010); Sayag (2010); Ismael (2013); Drogalas, Pazarskis, Anagnostopoulou, Papachristou (2015); Amuchirai (2018)
3	IAR	Range of IA	- IAR1: Range of IA content - IAR2: Range of IA objects - IAR3: Range of IA cycle	+	Albrecht, Howe, Schueler, and Stocks (1988); Al-Twajiry, Brierley, and Gwilliam (2003); Arena and Azzone (2009); Mihret, James, and Mula (2010);
4	IAM	Methods of IA	- IAM1: IA based risk-oriented approach. - IAM2: IA based applying advanced technology - IAM3: Continuous audit	+	Sarens, De Beelde, and Everaert (2009) Ismael (2013)

(continued)

TT	Coding variables	Variables label	Measures and items	Expected	Resources
5	IAI	Independence of IA	<ul style="list-style-type: none"> - IAI 1: Direct and unlimited access - IAI2: Report directly to the top management level - IAI3: Authority to appoint /hire / fire IA chief, approve IA budget and plans - IAI4: IA department under the highest governance level. 	+	Sayag (2010); Mihret, James, and Mula (2010); Ismael (2013); Drogalas, Pazariskis, Anagnostopoulou, Papachristou (2015); Amuchirai (2018);
6	IAB	Operational basis of IA	<ul style="list-style-type: none"> - IAB1: Having an appropriate charter and procedures of IA - IAB2: Having an annual plan, detailed program of IA - IAB3: Having a program to ensure and improve IA quality. 	+	Ismael (2013); IIA (2016)
Dependent variable					
7	IAE	Effectiveness of IA	<ul style="list-style-type: none"> - IAE1: Evaluating the reasonableness and efficiency of mobilizing and using operational resources. - IAE2: Ensuring policies, regulations, plans and procedures complied. - IAE3: Detect fraud risk and prevent asset loss. - IAE4: Ensuring the reliability and effectiveness of the information system - IAE5: Ensuring business goals and strategies implemented - IAE6: Monitoring, evaluating and consulting to improve risk-managing processes. - IAE7: Monitoring, evaluating and consulting to improve internal control - IAE8: Monitoring, evaluating and consulting to improve internal governance processes. 		Ismael (2013) Dellai and Omri (2016); IIA (2016);

The following data analyzing the relationship between the characteristics of IA and IAE are compiled from the survey results of these 38 enterprises. The number of questionnaires handed out and collected from these 38 enterprises is $3 * 38 = 114$ observations (38 internal auditors; 38 representatives of the board of executive and 38 representatives of the board of directors). Thus, the determined sample size is suitable for exploratory as well as linear regression model analysis.

The test model influences the IA characteristics on IAE in the steel enterprises using quantitative variables including constituent observed variables, in which each observed variable is measured by the 5-level Likert scale. Therefore, the data analysis methods used include: descriptive statistical analysis; reliability of the scale of the variables in the model; exploratory factor analysis; analysis of simple correlation between variables; multicollinearity phenomenon and linear regression.

4. Research Results

4.1. The Reliability of the Scales and Exploratory Factor Analysis (EFA)

To evaluate the reliability of the scales for variables with 5-level Likert scale, the study use Cronbach's Alpha coefficient. After the first time, Cronbach's Alpha coefficients of the dependent variable IAE and five independent variables IAC, IAR, IAB, IAI, IAM all reach the required magnitude with the lowest coefficient of 0.661. The observed variables making up each initial variable have a Corrected item-Total correlation greater than 0.3 and the correlation coefficient, if the variable (Cronbach's Alpha if item deleted) is not larger than Cronbach's Alpha generic. Thus, the variables identified all have suitable scales.

Then, the study performed exploratory factor analysis for independent variables with conditions of the factor loading from 0.5 or higher (considered strong enough with a sample size above 100) (Hair et al., 2010). From 16 indicators of five independent variables, after EFA analysis and factor rotation, 16 indicators uploaded and converged into four factors, of which one new factor was generated from six indicators out of the two initial factors IAB and IAM. After consulting with experts, the new factor was named Internal Audit Basis and Method (IABM). Testing analytical conditions, all four factors IAC, IAR, IAI, IABM all have KMO coefficients > 0.5, so they reach the required magnitude and Bartlett's Test of Sphericity test is statistically significant (with sig. < 0.001). That shows the items are interrelated and could explain the same concept. Next, Initial Eigenvalues = 1.112 showed that the four retained factors were consistent with the percentage cumulative explanation at 57.158% of the variation (Table 2).

After EFA analysis and factor rotation, the two initial variables, IAB and IBM, combined into a new variable, IABM. Therefore, the new variable needs to be checked for reliability of the scale while the other variables keep their result. The results show that the IABM variable with Cronbach's Alpha is 0.788, better than the two initial variables, the correlation coefficients variable-sum and correlation coefficients if the type of variable guarantees the conditions. Thus, the scale of the IABM variable is highly reliable (Table 2).

Exploratory factor analysis for the dependent variable IAE is then performed. The result shows that IAE variable has KMO = 0.753, reaching the required magnitude, and Bartlett's test is statistically significant (with sig. < 0.001), Initial Eigenvalues index > 1, and total variance extracted > 50%. After using the Principal Component method and Varimax rotation, the result is that, from the eight initial indicators, only one factor can be extracted. So, the

component indicators of IAE variable are correlated with each other and focus on explaining a single concept, with the validity of IA with the ability to explain 50.178% of the variation.

4.2. Correlation Analysis

- Check of the univariate correlation relationship between the independent variables and the dependent variable: the correlation coefficient matrix table (Table 3) shows that the lowest Pearson correlation coefficient is 0.552 with significance levels sig = 0.000 are very small. Thus, each independent variable (IAS, IAC, IAR, IABM, IAI) has a univariate correlation with the dependent variable IAE.

- Check of the relationship between pairs of independent variables: Table 3 and Table 4 show that correlation coefficient between pairs of independent variables is within the permissible limit (not exceeding 0.8), the value of Tol the lowest is 0.556, still satisfy the Tol > 0.5 condition and the highest value of VIF is 1.959, all are below 2.0. The parameters are within the safety limit, so the variables do not correlate closely with each other or rule out multicollinearity between the independent variables.

4.3. Linear Regression Model

According to Table 4, the value of R^2 is quite close to 1 (R Square = 0.774), showing that the model built on the appropriate sample data and the selected independent variables can explain 77.4% of the differences of the evaluation levels on IAE in the surveyed enterprises. Besides, the Durbin-Watson coefficient = 1.951 proves that the error part does not have first-order sequence autocorrelation, meaning that the sample data is using enough quality to continue regression analysis for the model.

Consider adjusted R^2 value and quantity F: Adjusted R Square value is at 0.763, quite close to 1; at the same time, the value of F has sig. very small (Table 5). This shows enough evidence to reject the null hypothesis of the population R^2 or the regression model is appropriate in the population. Thus, it can be concluded that the built-up linear regression model is also consistent with the research overall with very high reliability (99%).

4.4. Hypothesis Testing

To test if regression coefficient B_i of each independent variable is non-zero ($B_i \neq 0$), the statistical quantity t is used. In Table 6, the t -statistics are significant 0.1%. Furthermore, Variance inflation factor (VIF) coefficients are less than 2 ($VIF < 2$) and the Tolerance are greater than 0.5 (Tol > 0.5).

Table 2: Results of EFA and testing the reliability of the scale (2nd time)

Variables	Number of Items	Component				Cronbach's Alpha	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
		1	2	3	4			
IABM- Operation basis and method of IA (Remained)								
IAM1: Based risk-oriented	6	.796					.552	.754
IAM3: Continuous audit		.620					.598	.741
IAB3: Ensuring quality.		.608				.788	.511	.767
IAM2: Advanced technology		.604					.508	.764
IAB2: Plan of IA		.575					.520	.761
IAB1: Charter of IA		.558					.567	.750
IAI- Independence of IA (Unchanged)								
IAI3: Authority of approval	4		.780				.534	.683
IAI1: Authority of accessing			.772				.642	.612
IAI2: Channel of report			.659			.740	.486	.708
IAI4: IA department's position			.526				.492	.710
IAC-Capacity of IA staff (Unchanged)								
IAC1: Experience of IA staff	3			.804			.516	.536
IAC2: Skills of IA staff				.622		.672	.486	.584
IAC3: Knowledge of IA staff				.743			.463	.608
IAR-Range of IA (Unchanged)								
IAR2: Range of IA objects	3				.761		.600	.372
IAR1: Range of IA content					.519	.661	.396	.659
IAR3: Range of IA cycle					.832		.435	.613
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.835				
Bartlett's Test of Sphericity	Approx. Chi-Square			540.366				
	Sig.			.000				
Total Variance Explained	Initial Eigenvalues			1.112				
	Cumulative			57.158				
IAE- Effectiveness of IA (Unchanged)								
IAE1- Operational resources	8						.561	.826
IAE2: Compliance							.647	.815
IAE3: Fraud -loss risk							.567	.826
IAE4: Information system							.422	.842
IAE5: Goals and strategies.						.843	.659	.813
IAE6: Risk management							.571	.825
IAE7: Internal control							.582	.823
IAE8: Governance processes.							.615	.821

Table 3: Correlation analysis between quantitative variables

Variables		IAS	IAR	IAC	IABM	IAI	IAE
IAS	Pearson Correlation	1	.044	.233*	.587**	.395**	.731**
	Sig. (2-tailed)		.640	.012	.000	.000	.000
IAR	Pearson Correlation		1	.000	.000	.000	.568**
	Sig. (2-tailed)			1.000	1.000	1.000	.004
IAC	Pearson Correlation			1	.000	.000	.552**
	Sig. (2-tailed)				1.000	1.000	.000
IABM	Pearson Correlation				1	.000	.648**
	Sig. (2-tailed)					1.000	.000
IAI	Pearson Correlation					1	.558**
	Sig. (2-tailed)						.000
IAE	Pearson Correlation						1
	Sig. (2-tailed)						

Table 4: Model Summary Conformity Test

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.880 ^a	0.774	0.763	0.4867	1.951

Table 5: Testing the suitability of the overall regression model

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	87.413	5	17.483	73.792	.000 ^b
	Residual	25.587	108	.237		
	Total	113.000	113			

Table 6: Testing significance of the coefficients in the linear regression model

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.655	.179		-3.669	.000		
	IABM	.495	.061	.495	8.098	.000	.562	1.779
	IAI	.254	.053	.254	4.777	.000	.739	1.353
	IAC	.291	.049	.291	6.002	.000	.890	1.123
	IAR	.256	.046	.256	5.583	.000	.996	1.004
	IAS	.267	.070	.261	3.795	.000	.510	1.959

Thus, the model does not contain multi-collinearity phenomenon and the variables are suitable for regression analysis, the regression coefficients B_i corresponding to the independent variables in the model are all non-zero). That means that the variables IAS, IAR, IAC, IAI, IABM all affect the dependent variable IAE with very high reliability (99%). Therefore, the regression equation is established as follows:

$$IAE = -0.655 + 0.267*IAS + 0.291*IAC + 0.256*IAR + 0.254*IAI + 0.495*IABM$$

4.5. Linear Regression Analysis

To check whether the regression analysis assumptions are warranted, the thesis uses Histogram charts, Normal P-P Plot charts, Scatterplot scatter charts obtained from SPSS:

- Histogram chart: the normalized residue is distributed in bell shape, the average value is approximately 0 and the standard deviation is approximately 1, so the normalized residue has a distribution of normal distribution.

- Normal P-P Plot chart of normalized residual: the percentile values of the concentrated variable are close to the expected line, which shows that the normalized residual has distribution near the normal distribution, good research data.

- Scatterplot scatter chart: the normalized predictive value does not change according to the rule when the normalized residual changes. Therefore, there is no effect of residual on the dependent variable meaning that assumptions about the linear correlation are not violated. Thus, the regression assumptions are guaranteed, that is, the regression model is meaningful.

5. Results and Discussion

5.1. Results and Discussion

In the regression model, from the initial six independent variables through the analysis steps, only five variables remain. The partial regression coefficients B_i represents the change in the mean value of the dependent variable (IAE) when the independent variable changes under the assumed conditions of other variables. The regression coefficients B_i are all positive signs (+), so the effects of the independent variables on the dependent variables are all positive (in the same direction). Specifically, assuming the factors include IAI, IAC, IAR the advanced and complete level of IABM were unchanged, when IAS increase 1 unit (i.e., IA department had 1 more auditor), IAE will increase by 0.267 with 99% confidence. Similarly, when each factor of IAC, IAR, IABM and IAI is assessed to increase by 1 unit while other factors were unchanged, IAE was assessed to increase by 0.291, 0.256, 0.495 and 0.254, respectively,

with 99% confidence. Thus, IAI, IAC, IAR, IABM and IAS all positively affect the dependent variable IAE with 99% confidence. Comparing with the results of univariate tests, the multivariate regression results show consistency when in the correlation test, the independent variables IAR, IABM, IAI, IAC, IAS all have a relationship affects the dependent variable. This result also supports the hypotheses H1, H2, H3, H5 and H4-H6 that have been built, the impact direction of each factor on IAE as expected.

Continuing to compare the impact of factors on the dependent variable in general correlation with other factors, it can be seen that: IABM variable has the largest B_i coefficient of 0.495, so IABM has the strongest impact to change the dependent variable. The regression coefficients of remaining variables including IAS, IAC, IAR and IAI are much smaller than the coefficients of IABM and not much difference between them. In which, the coefficient of the variable IAI is the smallest ($B_i = 0.128$), so it is the variable that has the weakest impact on the change of the dependent variable. This can be explained that IA regulation, IA plan are the basis, framework, guideline for IA activities, help adding more quality assurance program. So, IABM (Internal Audit Basis and Method) is a really important factor in ensuring the effectiveness of IA. The remaining factors are also influenced by this factor. Compared to expectations, the weakest effect on IAE of IAI was unexpected.

Compared with results of previous studies by Zain et al. (2006), Arena and Azzone (2009) and Ismael (2013), it can be seen that effecting relations factors of IAC, IAI, IAS, IABM on IAE are consistent with previous studies. However, there is a contradiction in the research results on the scale factor effect of IA. This study demonstrates a positive and strong relationship between the size of IA and its effectiveness in the enterprise. Some experts explain that a larger workforce will help solve the workload of IA more, not vacate the tasks and functions, thereby increasing the effect. However, Isamel (2013) and Arena and Azzone (2009) found no evidence to support this relation.

5.2. Recommendations

The results of this study are the basis for the following recommendations for Vietnam's steel enterprises in the current context.

Firstly, strengthening operational basis of IA toward full, advanced approach to IIA standards:

- It is necessary to develop an IA strategy with the orientation of ensuring efficiency, efficiency, added value for the operation of enterprises in the field of risk management, financial reporting, internal control, and corporate governance cycle;

- Develop and complete IA regulations, IA handbook and document system working documents of internal auditor;
- Develop a plan of risk-based IA with a focus on high-risk operations/divisions;
- Develop programs to ensure and improve the quality of IA.

Secondly, applying modern, appropriate and effective IA methods and techniques:

- Implementing a risk-oriented audit approach based on the identified critical risk segments and activities for the audit planning and implementation;
- Equip and use audit support tools, audit software, pre-installed audit programs, auditing techniques aided by computer (CAAT) to serve internal audit as in the management and keeping of records, working papers;
- Perform continuous audits to manage risks, control and assess risks on an entire organization basis on a regular basis.

Thirdly, increasing the independence of IA:

- Establishing the position of IA department directly under the highest governance level in the governance apparatus so that IA is not affected and IA scope is limited;
- The authority to approve major decisions related to IA such as approving the decision to appoint or dismiss the head of IA department, approving the plan and budget of IA should be under the highest management level such as the Board of Directors or Auditing Committee;
- IA has direct and unlimited access to parts/activities in the enterprise in order not to be affected by the audit scope;
- The Chief of IA reports directly to the highest level of management, and only administratively reports to the executive board of the enterprise.

Fourth, increasing the size and capacity of IA staff:

- Focus on improving the capacity of the auditor to meet the requirements of the modern IA including professional knowledge and skills, audit experience;
- Continuously develop expertise for auditors through continuous professional training and fostering, encouraging auditors to take auditing certificates;

Fifth, expanding and not miss the scope of IA:

- Determine the scope of IA to suit the requirements of the new development phase in the direction of reducing the audit density of traditional activities, expanding and shifting focus to auditing new content arrays of time. The urgent need for steel companies such as operational audit, environmental audit, energy and raw material audit and labor safety audit.
- Must reserve enough time to perform extraordinary audits; performing thematic audits according to the principle of rotation;

Sixth, reforming the internal governance structure according to good corporate governance practices:

- Take advantage of international good corporate governance practices to apply, comply with the provisions of Vietnamese Government's Decree No 71/2017/NĐ-CP on corporate governance and should refer to the Corporate Governance Code.
- Building a corporate governance structure based on a modern governance model in which the chairman of the board of directors is independent, not concurrently executive.
- Establishing an Audit Committee as the agency representing the Board of Directors in performing tasks related to the monitoring of IA system, financial reporting and risk management.

6. Conclusion

Through a survey of Vietnam's steel enterprises, this study has provided empirical evidence on the statistically significant effect of IA characteristics on IAE, including the solar factor (size of internal audit) and physical factors (independence of IA, scope of IA, capacity of IA, methods and operational basis of IA). The impact levels are different, but are in the same direction with high reliability up to 99%. This result can be used by steel enterprises in determining the effect of each factor belonging to IA on its own effectiveness depending on the specific parameters of IA. At the same time, the research results provide the administrators and leaders of steel enterprises with some suggestions on policies and solutions to enhance IAE through the action to enhance independence of IA, expanding the scope of IA, increasing the size and capacity of IA team, strengthening operational basis of IA and applying appropriate and modern IA methods.

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