FACTORS ASSOCIATED WITH THE ROLE OF INTERNAL AUDIT IN COMBINED ASSURANCE: AN INTERNATIONAL EVIDENCE

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ABSTRACT

In a VUCA world, the board as a governing body of an organization has to see the risk management process more stringently. Their risk oversight is based on various assurance providers, which can be categorized into three lines of defence. As the third line of defense, internal audit needs to coordinate the combined assurance of the three to avoid gaps and overlaps, but little is known on this role. This study uses binary logistic regression to explore factors associated with internal audit involvement in the organization's combined risk management assurance. We use 906 data samples drawn from the common body of knowledge survey performed by the Institute of Internal Auditors Global in 2015. We found that the use of technology, risk management maturity, frequency of management's risk assessment, three lines of defense model adoption, and coordination with the external auditor are significantly associated with the formal combined assurance implementation. The study results fill the gap in combined assurance knowledge and are beneficial to the internal and external audit practitioners, board of directors and senior management, regulators, and standard-setting bodies.

Keywords: Internal Audit, Risk Management, Combined Assurance, Risk Oversight, Agency Theory

INTRODUCTION

Organizations face four situations based on how much information they know and how capable they are to predict the outcome of the action taken. These four quadrants are (1) volatility (high knowledge-high capability), (2) uncertainty (high knowledge-low capability), (3) complexity (low knowledge-low capability, and (4) ambiguity (low knowledge-high capability) (Bennett & Lemoine, 2014). In these four increasing situations, the VUCA, board as a governing body in an organization, needs to oversee the risk management process in the organization in a more stringent way (Kuznik, 2015). Unfortunately, boards are not involved in the daily operation of the organizations. They have to rely on the assurance provided by many parties, especially to the Internal Auditors (IA), whose function is to evaluate and improve the efficacy of the risk management process (Sarens et al., 2009).

Many regulators in various countries have adopted Three Lines of Defense (TLOD) framework to strengthen good governance. This framework divides the assurance providers into three categories: the first line of defense, the second line of defense, and the third line of defense (FERMA & ECIIA, 2010). The implementation of TLOD, which is done with each line runs independently, potentially causing a gap or overlap in the whole risk oversight process. A survey conducted by OCEG showed that in an organization with a low level of maturity in the application of combined assurance between the three, each line would work in a silo. Consequently, as revealed in the results of the survey, there are difficulties in providing assurance, overlapping costs, lack of control in ensuring compliance and risk management, as well as difficulties in the data reconciliation (OCEG, 2017).

In the Standard 2050 and supplemental guidance issued by IIA, internal auditors are required to coordinate the three lines of assurance in order to avoid gaps and overlaps (IIA, 2018). Nevertheless, little is known about the role of internal audit in the combined assurance. It is necessary to study further what factors are significantly associated with their involvement in the effectiveness of combined assurance. The study of the combined assurance and internal audit also became further research suggested by previous researchers (Lenz & Sarens, 2012) (Engelbrecht et al., 2018). This study intends to explore the factors in the Internal Audit Function (IAF), which empirically significant in the role of internal audit in the combined assurance of risks. This study fills a gap in the literature on the role of IAF in that particular approach and gives a contribution to the practice of combined assurance coordination by the internal auditor.

LITERATURE REVIEW AND RESEARCH QUESTIONS

Risk Oversight, Combined Assurance, and Internal Audit

The board has an overarching responsibility to determine the strategy of the organization and to agree on the desired level of risk that goes with it. Board also has the task of overseeing the implementation of strategic and operational risk management. Management, on the other hand, is responsible for developing and implementing operational and strategic risk management to align with the strategy set by the board (ICGN, 2015). COSO also puts risk oversight by this board as the first principle in its risk management framework (COSO, 2017).

King Report IV defines combined assurance as a model to involve and optimize all assurance activities so that, altogether, it encourages effective control environments, strengthens the integrity of the information that supports decision making by management and board, and external reporting of organizations (IoD, 2016). In the TLOD framework initiated by FERMA and ECIIA, three parties assure the process of risk management. In the first line, assurance is done internally by operational management and internal controls. Risk management and other compliance functions give assurance in the second line. Then, the internal auditor and External Auditor (EA) conduct the third line of assurance (FERMA & ECIIA, 2011). Given that an internal auditor is a party in the organizations that, among its functions, perform the assurance of the risk management process and have a direct reporting line to the audit committee of the board, the board mainly relies on their oversight in risk management to the internal auditors (IIA, 2018). Figure 1 shows the theoretical framework of this study.
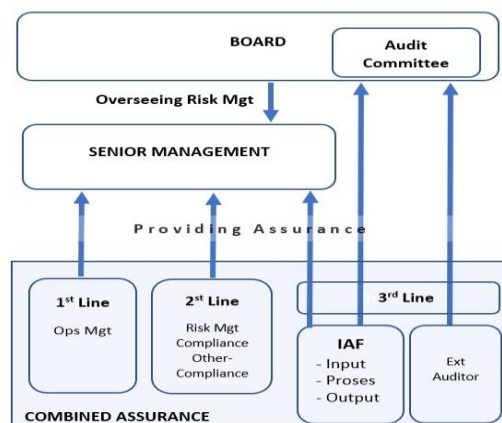

FIGURE 1
THEORETICAL FRAMEWORK

A previous study conducted by Decaux and Sarens showed factors in IAF adopting combined assurance. There are factors significantly associated with the adoption of combined

assurance, namely: the committee that conducts risk management oversight, risk management maturity, the number of assurance providers, risk-based internal audit and compliance to internal audit standards, board independence, CEO duality, Big-4 external auditors, organizational complexity, listed organizations, and leveraged organization (Decaux & Sarens, 2015).

This study complements the work that Decaux and Sarens have done by continuing it on other factors that theoretically can associate with the IAF involvement in combined assurance.

IA Input

This study investigates the association between input dimensions in IAF with the implementation of combined assurance. The input dimension can be seen from the indicators as follows: IAF size (number of staff), experience or age of IAF, IAF budget, use of technology and data analytics, and resource portions used in assurance and consulting assignments. Previous studies showed that the IAF size relates to the IAF mission. IAF that has a mission to evaluate risk management, for example, will have a larger size compared to the IAF, which is only focused on financial accounting audit (Anderson et al., 2012). Previous studies have also shown IAF age parallel with its maturity, its capabilities, and also related to the involvement of its more complex assignments (Sarens et al., 2011). Meanwhile, the influence of technology use in internal audit assignments is based on the research of (Kim et al., 2009) and the use of data analytic by internal audit based on research (Li et al., 2018). It is expected that inputs are positively and significantly related to the application of combined assurance. Thus we formulate the research questions as follows:

RQ1   Is the size of the IAF significantly associated with the adoption of the combined assurance model?

RQ2   Is the age of IAF significantly associated with the adoption of the combined assurance model?

RQ3   Is the IAF budget adequacy significantly associated with the adoption of the combined assurance model?

RQ4   How does the IAF strategy on resources associate with the adoption of the combined assurance model?

RQ5   Is the use of technology in IAF significantly associated with the adoption of the combined assurance model?

IA Process and Risk Management

In addition to inputs, essential dimensions in IAF are process and output (Trotman & Duncan, 2018). This study explores the association between the process dimensions in IAF with the adoption of combined assurance, particularly in the aspect of risk management. Indicators of this IAF process dimension can be seen in the use of risk-based internal audit planning, the involvement of IAF in risk assessment and its frequency, and the maturity of the ERM. Many previous studies have demonstrated influential factors in internal audit concerning the risk-based internal audit and the IAF role in the ERM (Coetzee & Lubbe, 2014; Castanheira et al., 2010; Lenz et al., 2014). It is expected that the IAF process with regard to risk management is positively and significantly related to the adoption of combined assurance. Thus we formulate the following research questions:

RQ6   Is the use of the risk-based internal audit methodology significantly related to the adoption of the combined assurance model?

RQ7   How does the organizational risk assessment associate with the adoption of the combined assurance model?

RQ8   Is the more frequent risk assessment significantly associated with the adoption of the combined assurance model?

RQ9   Is the involvement of IAF in ERM significantly associated with the adoption of the combined assurance model?

RQ10   Is the risk management process maturity significantly associated with the adoption of the combined assurance model?

IA Reporting Line

The IA reporting line is very pivotal in the IAF's independence and objectivity. Within the three lines of defense framework, the IAF has not only a reporting line to senior management but also a direct reporting line to the board. Many previous studies have demonstrated reporting lines that support independence, and so does the support of objectivity (Christopher et al., 2009; Abbott et al., 2016; Hoos et al., 2018). IAF independence and objectivity are expected to support the effectiveness of its role as the coordinator of combined assurance. Thus we formulate the research questions as follows:

RQ11   How does CAE's administrative reporting line associate with the adoption of the combined assurance model?

RQ12   How does CAE's functional reporting line associate with the adoption of the combined assurance model?

RQ13   Is the existence of an audit committee or equivalent significantly associated with the adoption of the combined assurance model?

RQ14   Is the more frequent meeting between the Audit Committee and CAE significantly associated with the adoption of the combined assurance model?

IA Coordination with EA

IIA provides Standard 2050 and related supplemental guidance as a basis for the professional practice of combined assurance coordination. According to this standard, IAF should coordinate with other assurance providers, both external and internal, of the organization. In this context, IAF has a very close partnership with external auditors. This study investigates the relationship between IAF and external auditor, both in the process of internal audit planning and the support of internal audit in the work of external auditor and its impact on the implementation of combined assurance. Many studies have been conducted on the subject of coordination between internal and external auditors in fraud risk management (Wang & Fargher, 2017); internal auditors support the work of external auditors both in reducing the working hours; and reduction of fees. In a broader sense, the previous studies also examined trust relationships and cooperations in the context of the TLOD model (Lee, 2016; Mat Zain et al., 2015; Axén, 2018; Morais & Franco, 2019). Based on the above discussion, the following research questions are then formulated:

RQ15   Is the more time spent by internal audit to support external audit works significantly associated with the adoption of the combined assurance model?

RQ16   Is the input from the external auditor in the internal audit plan significantly associated with the adoption of the combined assurance model?

RQ17   Is consultation with external auditors significantly associated with the adoption of the combined assurance model?

RQ18   Is supporting external auditors significantly associated with the adoption of the combined assurance model?

Three Lines of Defense (TLOD)

Three lines of defense model initiated by FERMA and ECIIA in 2011 (FERMA & ECIIA, 2011) and began popular since widely adopted by many parties, including the Basel Committee on Banking Supervision in 2012 (Basel Committee on Banking Supervision, 2012) (Al-Matari et al., 2016) and the IIA Global in 2013 (IIA, 2013). In this model, IAF becomes the third line of defense, which conducts the assurance of the risk management and compliance works on the second line. IAF also evaluates the assurance made by operational management as the first line so that IAF should not directly under the function of risk management, compliance, or finance (Chambers & Odar, 2015). With the application of the TLOD model, there is still a

possibility of two directions, where the combined assurance can either be segregated or otherwise coordinated. Hence, we formulate the following research questions:

RQ19   How does the implementation of three lines of defense associate with the implementation of the combined assurance model?

Control Variables

We believe that organization's assets and revenues are essential drivers to implement a combined assurance approach (Sasongko & Marota, 2016). However, in this study, we focused on the perspective of the internal audit, so we treat the organization's assets and revenues in the control variables. There are several previous research used assets and revenues in the control variables (Abbott et al., 2016; Mazza & Azzali, 2015).

METHODOLOGY

Sample

The data to be used in this research is secondary data derived from the Internal Auditing Common Body of Knowledge (CBOK) Survey in 2015. CBOK survey is the world's largest survey on IAF conducted by the Global Institute of Internal Auditors (IIA) Research Foundation once every five years. Total respondents who participated in the CBOK 2015 are 14,518 practitioners from 166 countries in eight different geographical areas across various industries, sizes, and jurisdictions.

There are no specific restrictions on the characteristics of the respondents included in this study. We cover the respondents who fill in the questions completely according to the variables investigated in this study, which are 906 internal audit practitioners across the world as the sample. However, we exclude any outliers' value that may affect the results of the investigation. There are also no restrictions on the geographical and regional aspects since the research questions are related to global professional issues. Nevertheless, we compare the models between regions to enrich the discussion.

Variable Definition and Empirical Model

The dependent variable in this study is the formal implementation of the combined assurance model by organizations. IA Combined Assurance represents this variable. The information of this variable is obtained from CBOK 2015 question number 77 (Q77), which asks if the respondent's organization has implemented a formal combined assurance model. We categorize the "Yes" response with code 1, which means that the organization has adopted the formal model of combined assurance. In contrast, the other option is categorized as "No," with code 0, which means that the organization does not or has not implemented the formal combined assurance model.

We include a total of 21 determinants derived from the research questions in our study as independent variables. Table 1 in the appendix shows the complete definition and measurement of the variables used in this study. To summarize all the variables involved, we build a model in this study as follows:

$$
\begin{aligned}
IA\_CombinedAssurance = \ & \beta_0 + \beta_1 IAsize + \beta_2 IAage + \beta_3 IAbudget + \beta_4 IAstrategy + \beta_5 IAtech + \beta_6 risk\_basedIA + \\
& \beta_7 risk\_assess + \beta_8 risk\_freq + \beta_9 IA\_ERM + \beta_{10} RM\_maturity + \beta_{11} line\_adm + \\
& \beta_{12} line\_function + \beta_{13} AC\_exist + \beta_{14} CAE\_ACmeeting + \beta_{15} work\_weeks + \\
& \beta_{16} external\_request + \beta_{17} external\_consultation + \beta_{18} external\_support + \\
& \beta_{19} three\_lines + \beta_{20} assets + \beta_{21} revenue + \varepsilon
\end{aligned}
$$

Data Analysis

We analyze the data quantitatively using the binary logistic regression method. We use this method because of the characteristics of the dependent variable that has a nominal binary scale, as shown above. The relationship model between dependent and independent variables based on regions is analyzed separately for later comparison.

A binomial logistic regression model is constructed based on several assumptions, *i.e.,* (1) The dependent variable is dichotomous, (2) One or more independent variables can be continuous, ordinal, or nominal, and (3) Independent variables must be mutually independent (non-multicollinearity) (Agresti, 2019). The first and second assumptions can be met without statistically tested. While the third assumption needs testing, as shown in Table 1, to see if the data has satisfied those assumptions.

Table 1 ASSUMPTIONS TESTING		
Assumption	**Testing**	**Criteria**
Non-Multicollinearity	Collinearity Diagnostic:	
	- Tolerance value	>0.1
	- Generalized variance inflation factor (GVIF)	<10

Once all the assumptions are met, the process continues to data processing. Table 2 shows the evaluation to interpret the result of the logistic regression model. In addition to the tests, we also discuss the further interpretation of the regression coefficient using the odds ratio to obtain relative comparative information between the independent variables and their impact on the dependent variables. In this study, the odds ratio for each independent variable means the probability to contribute to the implementation of combined assurance, compared to no contribution to that implementation.

Table 2 MODEL EVALUATION	
Evaluation	**Testing**
Goodness-of-fit	- Hosmer Lemeshow Test ($\chi2$)
	- Nagelkerke (pseudo R2)
Overall model	Likelihood Ratio (LR) Test ($\chi2$)
Test of individual predictors	Wald Test ($\chi2$)

RESULTS AND FINDINGS

Descriptive Statistics and Univariate Analysis

For the purposes of modeling, this study combined the region with a relatively small number of samples. Regional mergers still pay attention to the similarities in the characteristics of internal audit functions. Mapping the representation of 906 respondents is based on three geographical regions: America, Europe &Australia, and Asia&Africa. Table 3 shows respondent representation dominated by the Americas (north, central, and south) with a proportion of 44%.

Table 3 REGIONS REPRESENTED				
No	**Region**	**Frequency**	**(%)**	**Cumulative**
1	America	395	0.44	0.44
2	Europe&Australia	240	0.27	0.7

3	Asia&Africa	271	0.3	1
	Total	906	1	

Furthermore, descriptive and univariate statistical analysis of the available data is carried out. This analysis also compares geographic regions. Depending on the type of variable scale, independent testing is performed to determine if there are parameter differences between existing geographic regions using the F or χ^2 tests presented in Table 4.

Table 4 **DESCRIPTIVE STATISTICS AND UNIVARIATE ANALYSIS**					
Variables	**All dataset**	**America**	**Europe & Australia**	**Asia& Africa**	**F-statistic/χ2 (Sig.)**
IA_CombinedAssurance	0.25 (0.44)	0.19 (0.39)	0.27 (0.45)	0.34 (0.47)	19.18 (0.00)*
IAsize	15.74 (41.9)	15.34 (38.18)	16.31 (45.91)	15.82 (43.5)	0.04 (0.96)
IAage	1.09 (0.29)	1.13 (0.34)	1.08 (0.26)	1.05 (0.21)	7.82 (0.00)*
IAbudget	2.27 (0.62)	2.34 (0.60)	2.28 (0.63)	2.15 (0.64)	13.37 (0.00)*
IAstrategy	2.16 (0.57)	2.16 (0.56)	2.16 (0.61)	2.15 (0.56)	0.08 (0.96)
IAtech	2.41 (0.94)	2.52 (0.92)	2.42 (0.87)	2.25 (1.00)	13.33 (0.00)*
risk_basedIA	0.95 (0.21)	0.96 (0.20)	0.98 (0.14)	0.93 (0.26)	8.62 (0.01)*
risk_assess	2.06 (0.79)	2.06 (0.72)	2.10 (0.80)	2.04 (0.88)	0.94 (0.63)
risk_freq	1.98 (0.83)	1.83 (0.76)	2.03 (0.85)	2.15 (0.89)	23.75 (0.00)*
IA_ERM	2.31 (0.83)	2.31 (0.85)	2.25 (0.79)	2.36 (0.81)	4.37 (0.11)
RM_maturity	3.00 (0.87)	2.99 (0.88)	3.17 (0.81)	2.85 (0.87)	16.41 (0.00)*
line_adm	3.88 (1.86)	3.98 (1.95)	3.65 (1.90)	3.94 (1.66)	9.19 (0.01)*
line_function	1.70 (1.56)	1.64 (1.66)	1.85 (1.67)	1.67 (1.30)	13.21 (0.00)*
AC_exist	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	0.00 (1.00)
CAE_ACmeeting	5.70 (4.03)	6.61 (4.21)	4.86 (2.79)	5.11 (4.41)	18.84 (0.00)*
work_weeks	2.78 (1.40)	2.94 (1.34)	2.68 (1.48)	2.63 (1.40)	11.33 (0.00)*
external_request	0.22 (0.41)	0.26 (0.44)	0.18 (0.39)	0.19 (0.39)	6.51 (0.04)*
external_consultation	0.36 (0.48)	0.35 (0.48)	0.42 (0.49)	0.30 (0.46)	7.76 (0.02)*
external_support	0.08 (0.27)	0.12 (0.32)	0.05 (0.21)	0.05 (0.21)	15.99 (0.00)*
three_lines	2.22 (1.55)	2.50 (1.62)	1.70 (1.25)	2.26 (1.56)	43.6 (0.00)*
Assets	20.52 (2.87)	20.73 (2.72)	21.12 (2.81)	19.66 (2.95)	19.06 (0.00)*
Revenue	19.44 (2.78)	19.39 (2.78)	19.95 (2.70)	19.04 (2.80)	6.98 (0.00)*
N	906	395	240	271	
[a]the value presented is the mean, and the standard deviation value is presented in parentheses *significant at 0.05					

On average, dependent variables IA_CombinedAssurance differ between the three regions with significant p-values. It can be concluded in this study that the implementation of a combined assurance model on internal audit functions is different in each region.

The number of permanent employees (fulltime_employee) in the internal audit function does not differ significantly in each region. This indicates that the needs of the number of resources in the internal audit function in each region are nearly similar. The duration of the internal audit department was established (IAage), and budget adequacy (IAbudget) to conduct internal audit activities, significantly different in each region. While the division of resource allocation to perform assurance and consulting tasks (resources) and types of risk assessments conducted by the internal audit section of each does not differ significantly.

Frequency in conducting risk assessment (Risk_Assessment) and level of development of risk management process (Development_Level) found to differ significantly between the three regions. However, the relationship between internal audit and ERM was found to be no different

significantly. Furthermore, significant differences occur in the intensity of the use of technology in conducting internal audit activities (Technology). The length of time spent supporting external audit activities (Work_Weeks) also differs significantly. Administrative reporting lines (Line_Adm) and functional reporting (Line_Function) differ significantly between the regions.

In each region, the existence of an audit committee (Audit_Committee) is an absolute thing, so it is no different. The intensity of formal meetings involving audit committees and CAE or directors (Cae_Meeting) varies significantly between regions. Significant differences also occur in the implementation of three lines of defense. Interaction with external auditors in the form of development of audit plans (External_Request), consultations (External_Consultation), and important support (External_Support) differ significantly between regions.

The number of assets and revenues of the organization as a whole is significantly different.

Multivariate Analysis

Table 5 shows the diagnostic collinearity where all independent variables have tolerance values >0.1 and GVIF<10, so it can be interpreted that there is no multicollinearity between independent variables.

Table 5 COLLINEARITY STATISTICSA		
Variables	**Tolerance**	**GVIF**
Iasize	0.852	1.174
Iaage	0.958	1.044
Iabudget	0.937	1.067
Iastrategy	0.962	1.04
Iatech	0.882	1.134
risk_basedIA	0.92	1.087
risk_assess	0.942	1.061
risk_freq	0.953	1.049
Iaerm	0.93	1.075
rm_maturity	0.809	1.237
line_adm	0.935	1.07
line_functional	0.947	1.056
cae_acmeeting	0.895	1.117
work_weeks	0.978	1.022
external_request	0.919	1.088
external_consultation	0.894	1.118
external_support	0.944	1.06
three_lines	0.846	1.182
assets	0.429	2.332
revenue	0.45	2.221
a. Dependent Variable: IA_CombinedAssurance		

Logistic Regression Analysis

Logistic regression with the backward elimination method is chosen considering the number of independent variables involved. For the full dataset, the results show that some variables are not statistically significant. Size (RQ1), age (RQ2), budget (RQ3), and strategy on resources of the IAF (RQ4) are not statistically significant associated with the implementation of

the combined assurance model. But in America, there are IAF age and IAF budget that are statistically significant. Similarly, the use of RBIA methodology (RQ4) and IAF involvement in ERM are not statistically significant, but in America, this involvement is significant.

In terms of reporting lines, both administrative reporting line (RQ11) and functional reporting line (RQ12) are also not statistically significant, except in Europe & Australia that administrative reporting is significant. In the IAF's relationship with the audit committee, the existence of an audit committee or equivalent (RQ13) and frequency of meeting between the Audit Committee and CAE (RQ14) are not statistically significant. Meanwhile, in the context of external auditors' relation, input from the external auditor on the internal audit plan (RQ16) and consultation with external auditors (RQ17) are also not statistically significant, except in the region of Europe & Australia.

In contrast, there are seven variables that are statistically significant based on the regression model above. Table 6 shows the results of the regression. The use of technology in IAF (RQ5) is significantly associated with the adoption of the combined assurance model. This significance is supported mainly by the Asia & Africa region. Organizational risk assessment (RQ7), especially comprehensive risk assessment done by management, is statistically significant.

The more frequent (RQ8) and the more mature (RQ10) this risk assessment performed by an organization is also significantly associated with the adoption of the combined assurance model. In the context of external auditor relation, the more time spent by internal audit to support external audit works (RQ15 & RQ18) will support the adoption of the combined assurance model. And lastly, the implementation of TLOD (RQ19) is significantly associated with the implementation of the combined assurance model.

Table 6 LOGISTIC REGRESSION RESULTS[a]				
Variables	**All dataset (IA Combined Assurance)**	**America (IA Combined Assurance)**	**Europe & Australia (IA Combined Assurance)**	**Asia & Africa (IA_CombinedAssurance)**
IAsize				
IAage		-1.749** (0.004)		
IAbudget		* (0.059)		
IAstrategy				
IAtech	** (0.016)			** (0.004)
Risk_basedia				
Risk_assess	* (0.065)			
Risk_freq	** (0.003)	** (0.011)	* (0.063)	
IA_ERM		** (0.007)		
RM_maturity	** (0.000)	** (0.003)	* (0.095)	** (0.009)
line_adm			** (0.028)	
line_functional				
CAE_ACmeeting				
Work_weeks	** (0.000)	* (0.085)		
External_request			-0.062814	
External_consultation			0.747** (0.030)	
External_support	-0.044382	-1.389** (0.012)	* (0.095)	
Three_lines	** (0.000)		** (0.019)	* (0.093)
Assets	-0.129** (0.000)			-0.166** (0.001)
Revenue				
Constant	2.575** (0.002)	1.715 (0.169)	0.852 (0.223)	4.531** (0.000)
LR Test (χ^2)	192.09** (0.000)	153.03** (0.000)	50.53** (0.000)	59.22** (0.000)

Hosmer-Lemeshow (χ2)	7.36 (>0.05)	1.71 (>0.05)	7.10 (>0.05)	3.81 (>0.05)
Pseudo R2	0.279	0.519	0.276	0.272
N	906	395	240	271

DISCUSSION AND CONCLUSION

The purpose of this study is to explore factors within the IAF related to the formal application of combined assurance. Several dimensions have been investigated, namely the input dimensions of the IAF, the IAF Process and risk management, the IAF reporting line, coordination between internal auditors and external auditors, and the implementation of three lines of defense. Of the five dimensions, then investigated a further 19 indicators. They are using responses from 906 practitioners in various regions represented in the CBOK database (2015), seen from descriptive statistics and univariate analysis as well as multivariate analysis with logistic regression that the application of combined assurance by companies is quite diverse in various regions of the world.

For the input dimension, the univariate analysis showed significant differences in the age, budget, and technology that the IAF uses between one region and another, whereas the size of the IAF and the strategy it uses are not very different. Further multivariate analysis shows that the use of technology by the IAF, especially by organizations in Asia &Africa, is a significant factor in the formal application of combined assurance. These findings are consistent with the results of Jeong Kim et al.'s research. (Kim et al., 2009; Li et al., 2018).

From the dimensions of the IAF process and risk management, the univariate analysis shows significant differences in IA risk-based methodology and risk assessment frequency between one region and another, but not too different in the IAF's involvement in enterprise risk management. Further analysis with regression analysis shows that risk assessment conducted by management with more frequency is a significant factor in the formal application of combined assurance. These findings are fairly consistent with previous studies (Coetzee & Lubbe, 2014; Castanheira et al., 2010; Lenz et al., 2014), although it is surprising that the risk-based internal audit approach is not particularly significant in the application of combined assurance.

As for the IAF reporting line dimension, it is not surprising that there is variability in application in various regions of the world, given the varied governance structure between anglo-culture, non-anglo culture, and other cultural countries. These cultural differences are studied by Islam et al., (2018). But it is surprising that based on the results of the regression, it turns out that the reporting line factor and the IAF's relationship with the audit committee are not significant enough. Thus the results of previous studies (Christopher et al., 2009; Abbott et al., 2016; Hoos et al., 2018) that prove that the IAF will get important support from the audit committee and senior management in carrying out its assignment are not sufficiently proven in the formal application of combined assurance

In relation to external auditors, it seems that the variability of the internal auditor's relationship with the external auditor is very significant. In various indicators, both the number of internal auditor working hours provided or requested by external auditors, as well as consultation and support from external auditors, all show significant differences. With the convergence of external audit standards and ongoing internal audit standards, it seems that this difference is not caused by differences in professional practice standards. Nevertheless, the support from external auditors to internal auditors is significant in the implementation of combined assurance consistently with the previous studies also examined trust relationships and cooperations in the context of the TLOD model (Lee, 2016; Mat Zain et al., 2015; Axén, 2018; Morais & Franco, 2019).

The application of TLOD is very varied in various regions, but the regression results show that this factor has a significant effect on the formal application of combined assurance. It is easy to understand when the level of application of TLOD is also consistent with the level of

application of combined assurance, given that the main forming components of combined assurance are the three lines in (FERMA & ECIIA, 2011) TLOD.

Key Contributions

To the best of our knowledge, this study is the first to explore the factors that influence the application of combined assurance since it was last conducted by Decaux & Sarenz. (Decaux & Sarens, 2015) by using a much greater number of samples (186 *vs*. 926), more explored factors, and a more equitable representation of respondents worldwide. Decaux & Sarenz provides evidence that oversight maturity, oversight committee, number AP, IIA compliance, BOD independence, big-4, and listed companies are significant factors in the implementation of combined assurance. This research is complementary to their study by providing empirical evidence that factors of technology used by the IAF, risk assessment by management, higher frequency of risk assessment, risk management maturity, two-way support with external auditors, and the application of three lines of defense are significant factors in the application of combined assurance.

Practical Implication

The findings of this study have some practical implications. First, the identification of IAF characteristics that contribute to supporting the implementation of combined assurance will help management to make effective resource allocation decisions and assist in the development of policies related to competencies and resources required for IAF or CAE management functions. Second, the findings are of interest to the board of directors who will oversee risk management and delegate to the audit committee or risk monitoring committee. Furthermore, the audit committee or risk monitoring committee can encourage factors that have a significant effect on the application of combined assurance. Third, from these findings, external auditors may play a greater role in improving the company's GRC by improving coordination with internal auditors. Finally, policymakers and standard-setting bodies will be interested in the findings because they can set important factors in issuing new governance guidelines.

Limitation

This study has some limitations. First, the CBOK survey that is the main source of research data is a survey of individual perceptions that may be subjective. Respondents also did not distinguish the level of practitioners who may have different levels of understanding according to their capacity. The association of multiple variables analyzed with dependent variables of the application of combined assurance formally does not indicate a causality relationship.

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