

MEASURING THE EFFECTIVENESS OF PUBLIC SECTOR AUDIT: SCALE DEVELOPMENT AND VALIDATION

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Abstract: There has been a growing interest in the effectiveness of public sector audit as a theoretical construct. However, despite the heightened recognition, the field still lacks a standardised measure that can be used in surveys to capture individual-level variation in the reputation judgments of public and other stakeholders. Therefore, this study aims to establish a standardised measurement of the effectiveness of public sector audit based on the conceptual definition. A survey study of 203 internal auditors and experts were carried out by employing non-probability purposive sampling. The data obtained were then interpreted based on the Partial Least Squares Structural Equation Modeling (PLS-SEM). Using the same data, a unidimensional scale of the effectiveness of public sector audit was tested. The public sector audit illustrates the content domains of internal audit quality, internal audit independence, proficiency of internal auditors and types of audit. The results suggest that the scale development and the validation of the effectiveness of public sector audit are internally reliable and that it is positively correlated with support for internal audit quality, internal audit independence, proficiency of internal auditors and types of audit. This study further recommends the extension of the scale development and validation used in this research for future researches in the private and public sector.

Keywords: Effectiveness, Public Sector Audit, Scale Development, Validation

1. Introduction

The increasing body of consistent and robust findings in the effectiveness of public sector audit in the last few decades show that there is a growing interest in this field of study. The findings obtained from the researches prove that due to the increasing cases of fraud, the government has been practicing effective monitoring and controlling in enhancing the effectiveness of public sector audit (Eden & Moriah, 1996; Fadzil, Haron, & Jantan, 2005; Ali, Gloeck, Ali, Ahmi & Sahdan, 2007; Mihret & Yismaw, 2007; Ahmad, Othman & Jusoff, 2009; Alzeban & Sawan, 2013; Djati & Payamta, 2013; Alzeban & Gwilliam, 2014; Shamsuddin, Divyaa, Kanagambikai, Shameene & Shameni, 2014; Drogalas, Karagiorgos & Arampatzis, 2015; Sakour & Laila, 2015; Berhe, Mihret & Ali, 2016; Chevers, Lawrence & Laidlaw, 2016; Asiedu & Deffor, 2017; Alias, Noor, Nawawi & Salin, 2019; Noor & Mansor, 2019c).

The same may be inferred to internal auditing in the public sector in Malaysia. However, in spite of having many monitoring bodies in reducing corruption and remarkable white-collar crimes, Malaysia continues to be rated as one of the corrupted nations. Based on the recent Corruption Perception Index (CPI), Malaysia is ranked as the 61st in a list of 180 countries (Mohan, 2019). The level of the public sector's corruption is ranged from 0 (highly corrupt) to 100 (very clean and transparent). The results signify that Malaysia scores 47, which exhibits that this country has serious corruption problems. This situation is considered worrying as the score has remained constant since 2017. This consistency shows that the level of transparency is still questionable since Malaysia is surrounded with high-profile cases.

According to Lenz & Hahn (2015), some of the factors that influence the effectiveness of internal audit are internal audit resources, organisation process and relationship factors complemented with

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institutional theory. Previous researches on the effectiveness of internal audit were mostly conducted using qualitative approaches including case studies. This method of research is undeniably essential in studying reputations at microlevels. However, it is important to note that to systematically measure the effectiveness of public sector audit is as important as to study it in its theoretical and conceptual perspective. Moreover, researches on bureaucratic reputation would also benefit from standardised measurement at microlevels especially when it focuses on individual parties such as internal auditors. Thus, this article records the development of a short 5-item scale that measures the effectiveness of public sector audit that can be used for various types of agencies including the private and public agencies.

2. Literature Review

2.1. *The concept of public sector audit*

Recent studies on the efficacy of internal audit exhibit the trend of the studies in internal audit which focus in the establishment of the organisation's objectives and performance improvement (Ma'ayan & Carmeli, 2016). It is stated that if the auditors review and contribute high-quality recommendations, the government will follow the recommendations and imitate the excellent actions introduced by them. On the other hand, Morin (2016) argues that the auditors do not have the power to ensure that the auditees accept and implement their recommendations. In developing countries, an internal audit is still insufficient to contribute to the value adding service. Therefore, the effectiveness of public sector audit is essential in assessing the internal audit, organisational and government objectives especially in reducing corruption and fraud. Hence, the scale development and validation for this study include four level of determinants which are associated with internal audit effectiveness: internal audit quality, proficiency of internal auditor, types of audit work and internal audit independence.

2.2. *Scale Development and Validation of Effectiveness of Public Sector Audit*

The quantitative measures used in this study were derived mostly from the literature reported in English and the adapted instruments were verified and tested in the context of Western countries. In this research, the questionnaire was also prepared in English comprising of seven sections with 75 items. A five-point Likert scale ranging from strongly agree (5) to strongly disagree (1) was used.

2.2.1. *Measures of Internal Audit Quality*

Internal audit quality is defined based on three processes which were adapted by (Alzeban & Gwilliam, 2014; Cohen & Sayag, 2010; Drogalas et al., 2015) and was measured using 15 items. Some modifications were made to the original questions after considering the comments and feedbacks obtained from the pre-test. The respondents suggested the researcher to group the items into three areas to fit this study and to avoid confusion of the details of the questions. The three areas are (1) planning, (2) audit execution and (3) reporting and recommendations. The first phase of audit process is to know how the audit is planned and executed, the second phase is conducting audit activities and the last phase is making report, giving recommendations and conducting follow-ups.

2.2.2. *Measures of Proficiency of Internal Auditor*

Some of the important factors that can improve the effective operation of internal audit are appropriate staffing and good staff management (Cohen & Sayag, 2010). A staff's proficiency is related to an individual's capability and the setting of the department in carrying out an assignment based on the competence of the staff's educational level, professional or skilful experience, budget of the department, training and hiring policies, capacity of the department, internal audit manual and the willingness of the staff for their continuous career development (Berhe et al., 2016). Proficiency of internal auditors was determined based on two specific areas which are skill and competencies. The construct of proficiency of internal auditor was measured using six (6) items based on the questionnaire

adapted from (Alzeban & Gwilliam, 2014; Asiedu & Deffor, 2017; Cohen & Sayag, 2010; Drogalas et al., 2015).

2.2.3. *Measures of Types of Audit*

There are three types of audit that are involved in internal audit in public sector agencies and they are financial, compliance and performance audit. The auditing process was conducted based on the compliance and performance audit as outlined by the National Audit Department (2017). A draft of the compliance report was first prepared to verify the agencies' financial management's compliance with the laws, other financial regulations and procedures. Internal auditors are subjected to review the precision and reliability of the financial and operating data. This review is important in ensuring the establishment of precise, latest, complete and essential information.

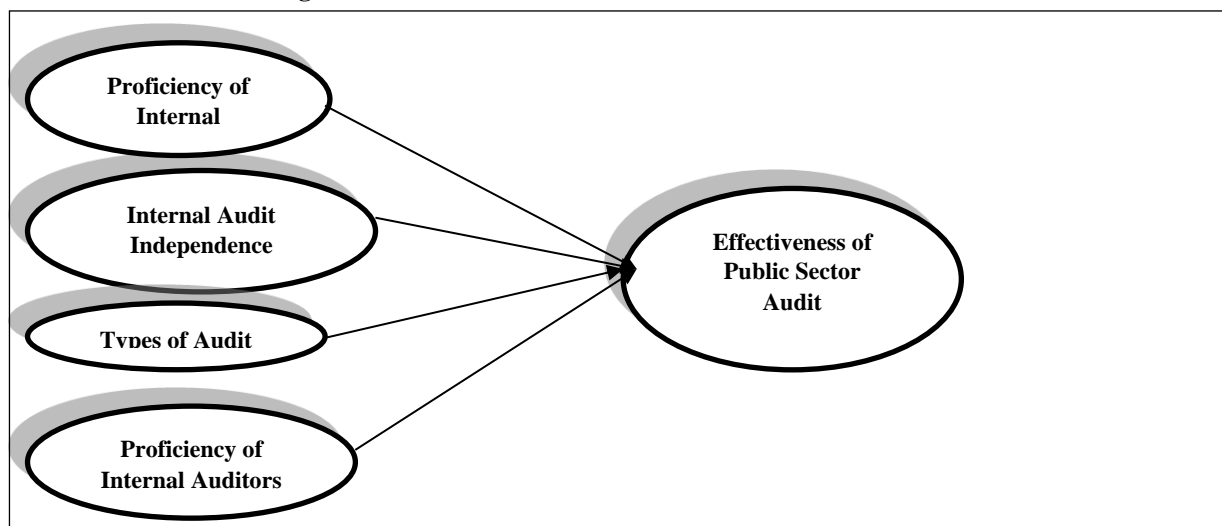
2.2.4. *Measures of Internal Audit Independence*

According to Drogalas et al. (2015) independence is defined as internal auditors' unconstrained access and the acquirement of internal audit in the organization's development. Compared to external auditors, internal auditors are more prone to encounter face independence as they are a part of the organization (Shamsuddin et al., 2014). Moreover, the external auditors report directly to the auditor general. Florea & Florea (2013) state that internal auditors must operate independently in auditing processes, and it must also be independent from daily internal processes. Internal audit independence was developed based on organizational and auditor's independence. The construct was measured based on ten (10) questions adapted from (Alzeban & Gwilliam, 2014; Asiedu & Deffor, 2017).

2.2.5. *Measures of Effectiveness of Public Sector Audit*

The public perceptions towards the government has become negative as the cases of fraud, corruption and malpractices in the public sectors keep increasing as years go by. Consequently, the integrity and credibility of the internal audit departments are also affected as the public start doubting the efficacy of the government as well as the internal audit. As a country which the economy solely relies on the constructed information, internal auditing is essential as they are the information provider for the public (Peurseem, 2005). Therefore, the negative issues that surround the internal audit department has triggered a global demand to refine and improve the effectiveness of internal audit. Figure 1 presents the model of the study. The measurement for effectiveness of public sector audit was adapted from (Alzeban & Gwilliam, 2014; Asiedu & Deffor, 2017; Drogalas et al., 2015). A 13-items scale was used to assess the respondents' perception of the current level of audit effectiveness in their organizations.

Figure 1: Antecedents of Effectiveness of Public Sector Audit



Source: Alzeban & Gwilliam (2014); Asiedu & Deffor (2017); Cohen & Sayag (2010); Drogalas et al. (2015).

3. Research Methodology

3.1. Scale Development

To validate and test our scale, a scale development process that includes the procedure of items generation, collection of reviews from experts and conducting a population survey of internal auditors was developed. The data collection was made based on the distribution of questionnaires to all internal auditors in Malaysia. The data were collected on the event of the National Audit Day which was took place in Kelantan, Malaysia. Altogether, 500 questionnaires were distributed but only 246 questionnaires were returned to the researcher. Out of the 246 returned questionnaires, 43 responses were found incomplete. Hence, only 203 responses were deemed appropriate and complete for the purpose of this study.

Firstly, based on the literature, an initial pool of agree-disagree items was generated. The review process involved a number of items from past measurements of the reputation of public and private agencies, including the research discussed by (Alzeban & Gwilliam, 2014; Asiedu & Deffor, 2017; Drogalas et al., 2015). However, some of the items from these scales were not applicable to this study as they concentrate on the private sector hence the items could not be used within the public agencies. We consulted the experts to discard ambiguous and redundant items and statements. As a result, an initial pool of 53 items that represent four domains of the effectiveness of public sector audit were produced. The construction of the questionnaires was made following an intensive and extensive literature review, consultations with accounting and auditing personnel including the experts who are knowledgeable in this field. Therefore, the two types of experts who were sought for feedback are:

- i. Topic experts who have an in-depth knowledge and proficiency in public sector audit. The experts' opinion shows the research's pertinence of the determinants in the public sector audit.
- ii. Survey methodologist who are expert in collecting precise data for the research questions. These experts provide face validity and content validity.

3.1.1. Topic Experts

In general, the feedbacks given by the experts are rather similar. The differences arise as each expert gave their opinions based on their area of expertise. For example, while the expert from the internal audit department commented on the practicality of internal audit activities, other experts provided a different theoretical perspective. Based on the comments and suggestions given by them, the questionnaires were modified and improvised. After developing a new list of statements, they were

resent for a second time validation. A pilot instrument was established after the second time validation was approved by the experts.

Above all, all professional personnel were in agreement that internal audit quality, internal audit independence, proficiency of internal auditors and types of audit contribute to the effectiveness of public sector audit.

3.1.2. Survey methodologists

Furthermore, to validate our scale, the researcher had also sought for the opinions and recommendations from survey methodologists. Besides validating our scale, their feedbacks are also important for face validity and content validity. Firstly, face validity is essential to check whether the questionnaire measures what it is supposed to measure. Face validity is a subjective assessment on the operationalization of a construct while content validity is the experts' judgement whether the measures wholly represent the domain. In specific, the questionnaire items were reviewed for clearness, clarity of instructions, readability, item representativeness, appropriateness of the scale and understandability. Generally, it is concluded that the instruments appropriately measured the characteristic of interest. The professionals also mentioned that the indicators used must measure the effectiveness of internal audit and the indicators must be applied prior to this research.

Content validity is also important to increase the validity of the questionnaire. Content validity is the extent to which a test accurately represents the content domain of the measure (Sireci, 1998). For this study, the Head of the Internal Audit Department in University Technology Mara (Kelantan's Branch) Malaysia summarised that the instruments in this study measured the characteristic of interest.

This study integrated face validity and content validity as suggested by (Anderson, Bell, Adamson, & Moynihan, 2002; MacKison, Wrieden, & Anderson, 2010). A review from some experts or senior practitioners as well as the pilot study was conducted to satisfy this condition.

3.2. Confirmatory Factor Analysis and Reliability Test

The analysis for convergent validity can be carried out by examining the significance of outer loading of indicators and the average variance extracted (AVE) for each measure. Convergent validity can be established using Partial Least Squares Structural Equation Modeling (PLS-SEM) by discovering the higher outer loadings. It is applied to the first-order reflective construct. A common principle says that the value of the outer loading should reach at least 0.708 or higher (Hair et al., 2014). Meanwhile, the outer loadings ranging from 0.40 to 0.70 must be discarded only if the removal could increase the reliability of the composite or AVE value (Hair et al., 2014). The convergent validity of the measurement model is indicated by the values of AVE at the construct level in .The results indicate that all constructs have satisfied the required level of AVE > 0.5 and Composite Reliability (CR) >0.7 as suggested by (Hair et al., 2014). The measurement model was created in the model by applying the loadings as constructed in Table 1. The AVE exhibits values ranging from 0.662 to 0.733. The results indicate that all constructs have satisfied the required level of AVE > 0.5 and CR >0.7 as suggested by (Hair et al., 2014).

The analysis of internal consistency of the measurement items requires the researcher to obtain the coefficient of Cronbach's alpha as well as the values of the composite reliability. In a more advanced stage of research, it is stated that the values should reach 0.70 to 0.90 to be considered as satisfactory (Nunnally and Bernstein, 1994). Table 1 displays the analysis of PLS-SEM of the composite reliability values for the internal audit quality, proficiency of internal auditor, internal audit independence and types of audit on the effectiveness of public sector audit. The readings record that the values of the composite reliability for internal audit quality was 0.959, proficiency of internal auditor 0.961, internal audit independence, 0.956, types of audit 0.952 and effectiveness of public sector audit was 0.973.

Table 1: Measurement Model

Construct	Item	Loading range	Composite Reliability (CR)	Average Variance Extracted (AVE)	Cronbach's Alpha (CA)
Internal Audit Quality (IAQ)	IAQ10	0.813	0.959	0.662	0.953
	IAQ11	0.867			
	IAQ12	0.839			
	IAQ13	0.778			
	IAQ14	0.713			
	IAQ15	0.834			
	IAQ2	0.723			
	IAQ3	0.839			
	IAQ4	0.853			
	IAQ5	0.862			
	IAQ6	0.857			
Proficiency of Internal Auditors (PoIA)	PoIA1	0.848	0.963	0.721	0.957
	PoIA10	0.850			
	PoIA11	0.821			
	PoIA2	0.799			
	PoIA3	0.831			
	PoIA4	0.886			
	PoIA6	0.796			
	PoIA7	0.873			
	PoIA8	0.911			
	PoIA9	0.867			
Internal Audit Independence (IAI)	IAI1	0.809	0.956	0.683	0.948
	IAI10	0.826			
	IAI2	0.808			
	IAI3	0.856			
	IAI4	0.844			
	IAI5	0.827			
	IAI6	0.834			
	IAI7	0.840			
	IAI8	0.828			
	IAI9	0.788			
Types of Audit (ToA)	ToA1	0.819	0.952	0.691	0.943
	ToA10	0.839			
	ToA2	0.902			
	ToA3	0.918			
	ToA4	0.873			
	ToA5	0.834			
	ToA6	0.829			
	ToA8	0.717			
	ToA9	0.730			
	Effectiveness of Public Sector Audit (EoPSA)	EoPSA1			
EoPSA10		0.890			
EoPSA11		0.853			
EoPSA12		0.853			
EoPSA13		0.833			
EoPSA2		0.896			
EoPSA3		0.881			
EoPSA4		0.857			
EoPSA5		0.884			
EoPSA6		0.852			
EoPSA7		0.819			
EoPSA8	0.752				
EoPSA9	0.895				

Notes: IAQ=Internal Audit Quality; PoIA=Proficiency of Internal Auditors; IAI=Internal Audit Independence; ToA= Types of Audit; EoPSA= Effectiveness of Public Sector Audit

This research’s indicator variables are regarded valid and have high correlations. The variables may be different, but it shows that they are not redundant. The items worked out with different aspects of the measured constructs and have high correlations. Thus, this measurement is categorised as a good measurement model (Jan-Michael Becker 2015).

Another assessment was conducted to validate the discriminant validity to observe and make sure that the items only calculate they respective constructs that they are assigned to and not to any other. Discriminant validity is the level of uniqueness and disparateness of a construct as compared to other constructs in the same model (Hair et al., 2014). Two of the most common methods in assessing discriminant validity are cross-loading and Fornell & Larcker (1981) criterion. The criterion compares the relationship between the constructs and the square root of the AVE for that construct.

Table 2 indicates the results of loadings and cross-loading of the constructs. Based on the table, there is a small dispute for the internal audit quality and proficiency of internal auditor’s construct. However the difference can be ignored since the value is 0.046 and it is regarded slightly minimal (Rahim and Magner 1995). Eventually, this research proves that it has fulfilled the specifications of the cross-loadings method and Fornell-Larcker criterion as it provides the evidences for the discriminant validity of the constructs.

Table 2: Fornell-Larcker Criterion

Construct	IAI	IAQ	EoPSA	PoIA	ToA
IAI	0.826				
IAQ	0.771	0.814			
EoPSA	0.784	0.800	0.856		
PoIA	0.777	0.860	0.799	0.849	
ToA	0.760	0.755	0.808	0.796	0.831

Notes: IAQ=Internal Audit Quality; PoIA=Proficiency of Internal Auditors; IAI=Internal Audit Independence; ToA= Types of Audit; EoPSA= Effectiveness of Public Sector Audit

4. Discussion

The main objective of this study is to establish a standardised measurement of the effectiveness of public sector audit. Hence, the determinants of internal audit quality, proficiency of internal auditor, internal audit independence and types of audit are identified. PLS Algorithm was applied in analysing the quantitative data. The results satisfy the first measurement that highlight the relationship between internal audit independence, internal audit quality, proficiency of internal auditors and types of audit with the effectiveness of public sector audit. Thus, the findings deliver empirical support to those of Alzeban & Gwilliam (2014); Asiedu & Deffor (2017); Cohen & Sayag (2010); Drogalas et al. (2015); Noor & Mansor (2019a); Noor & Mansor (2019b) who discovered that the determinants increase the effectiveness of the public sector audit.

5. Conclusion

In testing and establishing a standard measurement model of the public sector audit, the researcher had meticulously followed several procedures to ensure its validity and reliability. These scale development process includes the procedures of a theory-based generation of a large pool item, collecting reviews from experts, items refinement and Confirmatory Factor Analysis (CFA) of internal auditors to identify the 5-items of the effectiveness of public sector audit. Despite the thorough steps and methods, there are several limitations to our research and scale measurement. The first limitation is, this study was conducted based on voluntary, nonprobability sampling that may not be representative to the whole population. For example, future research could conduct a research by choosing the auditees as respondents. The second limitation is that our scale measurement was established on a sample of

internal auditors. Nevertheless, we believe that this scale is compatible to be used to private sector agencies even though the wording of the scale was established to be used in public sector agencies.

To conclude, despite the afore-mentioned limitations and flaws, our scale reflected a thorough development process that is approved by the professionals and experts in the respective field of stud. The scale also shows good reliability, content validity and both statistical convergent and discriminate validity. We are confident that the effort to develop and test the scale of the effectiveness of public sector audit serves as an essential area of scholarship in governance and public administration with a beneficial novice tool for future researches.

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