



Effect of Brainstorming and Expertise on Fraud Risk Assessment

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ABSTRACT

The purpose of this study is to examine the direct and interaction effects of brainstorming and auditors' expertise on fraud risk assessment. This study is motivated by the need to improve the government auditors' performance while maintaining high audit quality and increasing public confidence. The inability of the government auditors to detect a misstatement, particularly on the fraud risk may expose auditors to lawsuits which consequently lead to their bad reputation to the public. A 2×2 factorial design was employed using 151 government auditors as participants in this study. The results show that brainstorming and auditors' expertise impact the performance of the government auditors on fraud risk assessment. The results also show a significant interaction between brainstorming and auditors' expertise on the government auditors on fraud risk assessment. The findings of this study provide insights on the importance of brainstorming for government auditors with diverse expertise.

Keywords: Fraud Risk Assessment, Tests of Controls, Brainstorming, and Auditor' Expertise

JEL Classifications: M4, G3, H8

1. INTRODUCTION

All organizations are vulnerable to fraud risk irrespective of the industry that the organizations are involved. However, the type of fraud risks differs among industries and therefore, requires different prevention actions. Fraud is an intentional act conducted by one or more individuals among the management, those charged with governance, employees, or third parties that are involved in the use of deception to obtain an unjust or illegal advantage. Management fraud and employee fraud are two types of frauds that are relevant to the auditors. Management fraud relates to financial statement fraud while an employee fraud refers to the misappropriation of assets. Although management fraud and employee fraud are different, both types of frauds may cause a material misstatement in the financial statement. A material misstatement in the financial statement may affect investors' decision, and therefore, a fraud risk assessment is critical and needs to be done concurrently with the financial statement auditing. However, performing a fraud risk assessment in concurrent with the financial statement auditing might affect the fraud risk assessment performance (Knapp and

Knapp, 2001). Such concurrent practice is done due to time constraint. In addition, public pressure forces the auditors to perform the fraud risk assessment concurrently with the financial statement auditing (Braun, 2000). Therefore, the auditors need to assess the fraud risk that exists in an organization and at the same time performing financial statement auditing.

Government auditors came from diverse education backgrounds such as accounting, marketing, economic and banking. There are also government auditors who came from sciences discipline. The diversity of education backgrounds among the government auditors makes brainstorming for fraud risk assessment a necessity. This is in line with the International Standards on Auditing (ISA) 240 and International Standards of Supreme Audit Institutions (ISSAI) 240 that encouraged auditors to hold discussions with the engagement team members on the potential for material misstatement due to fraud. Brainstorming refers to a group of individuals that attempt to seek a solution to a problem or share information about a specific issue by producing a list of ideas or information. In fraud risk assessment, brainstorming encourages

the engagement team members to share client information, fraud risk indicator, and fraud experience. Brainstorming can also be a tool for knowledge transfer between the team members on the identification of fraud risks (Kerr, 2013). Due to the diverse expertise among the government auditors, the level of knowledge on fraud comes mainly from the auditors' experience. However, lack of experience in fraud detection may influence the auditors' performance in assessing fraud risk (Kozloski, 2011). The extent of the effect of different auditors' expertise on the brainstorming process of a fraud risk assessment remains uncertain. Thus, this study aims to examine the direct effect of brainstorming and auditors' expertise on fraud risk assessment performance. This study also examines the interaction effects of brainstorming and auditors' expertise on fraud risk assessment performance.

The findings in this study provide insight to the practitioners, especially government auditors on the importance of brainstorming as a tool for knowledge transfer between auditors. The results of this study would be useful in enhancing the guidelines by emphasizing brainstorming in audit planning, especially in a fraud risk assessment. The remainder of this paper is structured as follows. The next section discusses the literature review. Section 3 provides the research methodology and Section 4 present the results. A summary and conclusion discuss in the last section.

2. LITERATURE REVIEW

2.1. Fraud Risk Assessment and Internal Control

Opportunity in fraud triangle has always been associated with the internal control and is a mandatory element to commit fraud (Schuchter and Levi, 2015). Fraud can happen when one of these three aspects namely opportunity, pressure, and rationalization exist together or separately in an individual or a group of individuals. Therefore, it is important that the government auditors be able to assess the opportunity elements in a fraud triangle. The standards have also mentioned the use of fraud risk indicator in a fraud risk assessment. A study by Omar and Mohamad Din (2010) found that the government auditors perceive an opportunity 'red flags' as an important fraud risk indicator. Smith et al. (2005) have also suggested that opportunity is an essential element in assessing fraud risk. Opportunity is a manipulation of internal controls by an individual who wanted to commit fraud, concealing fraud and avoiding punishment. An opportunity influences criminal behavior. For example: If an employee is facing financial pressure but has no opportunity to commit fraud due to a good internal control, then the fraud risk would be low. However, if the internal control is weak, then the fraud risk would be high. The employees can create an opportunity to commit fraud by colluding with another employee (LaSalle, 2007). Therefore, understanding the opportunity in the fraud triangle is necessary since prior studies have shown opportunity as a mandatory element for fraudsters to commit fraud.

An organization develops internal control as an effort to minimize fraud risk. Internal control is a process designed to provide reasonable assurance of financial reporting reliability and compliance, according to the laws and regulations. The use of technology in an internal control process prevents human interferences. However, the opportunity is a mandatory element

for fraudsters to commit fraud (Schuchter and Levi, 2015). Thus, the government auditors need to continuously assess the internal control effectiveness because fraudsters also continuously assess the opportunity to commit fraud (Dellaportas, 2013). Arguably, there is a need for the government auditors to rely on audit technology in evaluating internal control. Continuous auditing is among the audit technologies available to assess internal control (Alles et al., 2008). By relying on audit technology, performance in assessing an internal control could be improved by increasing their reliance on an audit technology together with opportunity 'red flag' to evaluate internal control. Although the government auditors have used the internal control framework for reviewing the internal control, they still use the triangle fraud elements in reviewing internal control (Mohd-Sanusi et al., 2015). Thus, internal control is the first phase in preventing and deterring fraud risk, and the government auditors should be able to review the internal control effectively.

Auditors need to perform fraud risk assessment using tests of controls to gather evidence of fraud risk. Test of control is an audit procedure designed to assess the effectiveness of an internal control mechanism that is the first defense line from fraud. Tests of control is a structured task because the clarity of information and step in performing the tests of control. Therefore, the use of audit technology in performing fraud risk assessment using test of control might improve performance on fraud risk assessment. In fact, the use of audit technology assists auditors to focus more on the judgment task when the data analysis is performed using continuous auditing (Alles et al., 2008; Duh et al., 2006). Furthermore, fraud risk assessment using tests of controls may be able to overcome cost and time constraint faced by the auditors. For example Alles et al. (2008) used continuous auditing in tests of controls and found that test of control suits with continuous auditing. However, there is a lack of evidence on the auditing performance when using tests of controls with continuous auditing. Therefore, fraud risk assessment using tests of control is used to understand the effect to the fraud risk performance using test of control.

2.2. Brainstorming in Fraud Risk Assessment Using Tests of Controls

Most studies have agreed that brainstorming process leads to better performance (Alon and Dwyer, 2010; Carpenter, 2007; O'Donnell et al., 2000). Standards and guidelines have also encouraged the implementation of brainstorming during fraud risk assessment. However, due to time and resources constraint, sometimes brainstorming is not done appropriately by the government auditors. Without proper brainstorming process, task performance might be jeopardized, and the auditors might not be able to identify fraud risk during fraud risk assessment. Alon and Dwyer (2010) performed an experiment in their study and found a brainstorming group with decision aids provide better performance in fraud risk assessment compared to a group without the decision aids and individuals with decision aids. O'Donnell et al. (2000) found brainstorming improves the internal control assessment for an information systems environment. A group interaction during the brainstorming process made the team produce more quality ideas and information compared to individuals (Carpenter, 2007). With the availability of the technology, the auditors can use the

technology and perform the fraud risk assessment individually. Even though the auditors can use the technology, the quality of ideas may not be different when the brainstorming group performs fraud risk assessment using the technology (Alon and Dwyer, 2010). Therefore, brainstorming process is an additional benefit to fraud risk assessment using tests of controls.

The purpose of the brainstorming process is to ensure that the engagement team members share information, idea, and experience. During the brainstorming process, information such as fraud triangle, anti-fraud measures and the elements of fraud are discussed (Trompeter et al., 2013). However, the psychology literature reported mixed findings on the effect of brainstorming on performance. For example, Dennis and Valacich (1993) found that brainstorming did not generate more ideas due to process losses in their experiment. The auditors did not participate in the discussion in their experiment due to several reasons such as a junior auditor did not contribute since the senior auditor or manager was also involved in the brainstorming session. Furthermore, it is common that in a brainstorming session, only one auditor can talk at one time while other members listen to the ideas given by the auditor who provides the talking. While waiting for their turn to speak, block production may happen in which their idea may be lost due to the same idea or they perceive the idea to be inappropriate to the discussion. Other than production blocking, social loafing or free riding may also happen in brainstorming session (Diehl and Stroebe, 1987). Sharing of information, ideas and experiences on fraud risk may not take place because of production blocking and social loaf.

However, Carpenter (2007) found that the quality of ideas increase with the decreased quantity of ideas during a brainstorming process and thus, improves audit efficiency. A brainstorming is necessary for the government auditors to share quality ideas and most importantly, to allow knowledge transfer among the engagement team members (Kerr, 2013; Kozloski, 2011). Brainstorming leads the government auditors to focus on a given task such as fraud risk assessment using tests of controls. The auditors might modify the standard procedures according to the ideas from the brainstorming session (Hoffman and Zimelman, 2009). Prior studies in brainstorming that used fraud risk assessment (Alon and Dwyer, 2010; Carpenter, 2007). O'Donnell et al. (2000) found that brainstorming improves an internal control assessment for an information system. However, in the context of a public sector, brainstorming has not been extensively examined and has not been documented during fraud risk assessment. The lack of evidence of brainstorming in the public sector has led this study to explore the process of brainstorming using the government auditors as participants in this study. Therefore, the first hypothesis is developed:

H₁: The government auditors in brainstorming groups perform better than individual auditors in performing fraud risk assessment using tests of controls.

2.3. Auditors' Expertise in Fraud Risk Assessment Using Tests of Controls

Knowledge emphasis depends on the educational background, and it determines strategic reasons (Tabak and Barr, 1999). Individual skills, knowledge and cognitive base reflect the individual education background. In the public sector, government auditors have diverse

expertise because government auditors do not only audit financial statement. Although the National Audit Department provides training relating to auditing, internal controls and fraud risk assessment to the government auditors, the different knowledge due to the different education backgrounds still exist. For example, an auditor with an accounting education background is trained to assess the internal control using the internal control framework and also in audit judgment task (LaSalle, 2007). On the other hand, an auditor without an accounting education background does not receive proper training on the internal control framework, and in worst case scenario, the auditor may not have any accounting-related knowledge. Furthermore, an auditor with an accounting education background is already exposed to the conservative principles, and this makes a professional skepticism much better. While the placement of a government auditor without an accounting education background might perform less effective on fraud risk assessment using tests of controls. Therefore, a fraud risk assessment performance is likely to be affected by the diversity of the government auditors' expertise. Thus, the second hypothesis is developed:

H₂: The government auditors with expertise will have better performance than a non-expertise in the fraud risk assessment using tests of controls.

2.4. Interaction between Brainstorming and Auditors' Expertise

The public sector auditors have a diversity of expertise. The brainstorming session can improve the performance of fraud risk assessment by the government auditors even without expertise. The government auditors with expertise understand the internal control framework while government auditors without expertise only received a brief training when they first joined the services. Therefore, brainstorming and auditor expertise may affect the auditors' performance in fraud risk assessment. In a brainstorming session, government auditors can share information, ideas and fraud experiences related to fraud risk. Brainstorming can become a platform for knowledge transfer from government auditors with expertise to the government auditors without expertise (Kerr, 2013; Kozloski, 2011). Although the psychology literature has shown mixed findings, there has been a suggestion that production blocking and social loaf may arise during the brainstorming process. Carpenter (2007) found that in the auditing domain, an auditor in a brainstorming group provides more quality ideas compared to an individual. However, no further explanation on the auditors' expertise is given. Therefore, this study aims to provide understanding on the effects of brainstorming and auditors' expertise against the performance of fraud risk assessment using tests of controls. This study anticipates that there would be an interaction between the brainstorming and auditors' expertise. Therefore, the third hypothesis is developed:

H₃: Brainstorming and auditors' expertise have an interaction effect on fraud risk assessment performance, in such a way that expert auditors would perform better during the brainstorming session.

3. RESEARCH METHODOLOGY

Two independent variables were chosen in this study. The two variables are brainstorming and auditors' expertise. The objective

of this study is to examine the direct and interaction effects of an independent variable against the fraud risk assessment using tests of controls. Brainstorming variable was manipulated at two levels namely, a group or an individual in performing the fraud risk assessment. Auditors' expertise was also manipulated to two levels namely, a government auditor with a degree or diploma in accounting or otherwise. A factorial design experiment 2×2 was used in this study with two independent variables being manipulated at two levels. While the dependent variable, fraud risk assessment using tests of controls was measured using scores of the percentage of correct responses. The scores were calculated based on the number of correct responses divided by the total scores. The number of correct responses represents a transaction that has the same signatory as an authenticator and approver of payment voucher. This study chose 151 government auditors from various grades to be the participants in the experiment. One hundred and ten government auditors functioned as an external auditor while another 41 government auditors functioned as an internal auditor. Even though the function and line of reporting between the external and internal auditors are different, they still received the same amount of training. Studies have shown that there is no significant difference regarding performance between the external and internal auditors (Moyes and Hasan, 1996).

4. RESULT AND FINDINGS

4.1. Demography of Participants

The demographic profile of the participants in this study consists of 151 government auditors. Out of the 151 government auditors, 47 (31.1%) of the government auditors are male, and 104 (68.9%) of the government auditors are female. The average age of participants is 35.36 years old and has an average 9.86 years experience in the public sector. For academic qualification, 8 (5.3%) participants hold the post-graduate qualification, 61 (40.4%) participants have bachelor degrees, 10 (6.6%) participants have a professional qualification, 68 (45.0%) hold diplomas qualification and 4 (2.6%) participants have a certificate. A majority of the government auditors participated in this study do not have any membership. Only 28 (18.5%) of the participants are holding MIA, IIA or ACCA memberships. The government auditor scheme involved with the fieldwork consists of two groups namely, the professional and management group (Grade 41-54) and execution group (Grade 27-36). The difference between these two groups is that the execution group executes the program plan by the professional and management group. On the other hand, the professional and management group plan and monitor the execution of the plan. 44 (35.8%) participants are from the professional and management, and 97 (64.2%) of the participants are from a support group.

4.2. Descriptive Statistics

The overall mean score value of the performance of fraud risk assessment using tests of controls is 65.50. The descriptive analysis for each group is shown in Table 1. From the descriptive analysis, the government auditors in the brainstorming group have a better performance compared to the individual group. The government auditors with expertise also have better performance compared to the government auditors without expertise.

Table 1: Descriptive statistics

Independent variables	Auditors' expertise		Overall (n)
	Expert (n)	Non-expert (n)	
Brainstorming (n)	78.38 (37)	67.33 (45)	72.32 (82)
Individual (n)	70.24 (42)	37.41 (27)	57.39 (69)
Overall (n)	74.05 (79)	56.11 (72)	65.50 (151)

4.3. Brainstorming and Performance of Fraud Risk Assessment using Tests of Controls

An independent samples t-test was conducted to compare the performance of fraud risk assessment using tests of controls between the brainstorming group and individual. The results show significant difference at 5% ($t [129.22] = -2.782, p = 0.005$) in the performance of fraud risk assessment using tests of controls scores between brainstorming group ($M = 72.32, SD = 28.687$) and individual ($M = 57.39, SD = 35.960$). The magnitude of the differences in the mean score is very small (mean difference = $-14.926, 95\% \text{ CI: } -25.539 \text{ to } -4.312, \eta^2 = 0.05$). Therefore, the results indicate that the government auditors in the brainstorming groups have better performance in the fraud risk assessment using tests of controls compared to government auditors assigned as individuals. Therefore, hypothesis one is supported.

4.4. Auditors' Expertise and Performance of Fraud Risk Assessment using Tests of Controls

An independent samples t-test was also conducted to compare the performance of fraud risk assessment using tests of controls between the government auditors with expertise and government auditors without expertise. The results show that there is a significant difference at 5% ($t [149] = 3.461, p = 0.001$) in the performance of fraud risk assessment using tests of controls scores between government auditors with expertise ($M = 74.05, SD = 33.570$) and government auditors without expertise ($M = 56.11, SD = 29.767$). The magnitude of the differences in the mean score is moderate (mean difference = $17.940, 95\% \text{ CI: } 7.697 \text{ to } 28.183, \eta^2 = 0.07$). Therefore, the government auditors with an accounting education background have better performance in the fraud risk assessment using test of controls compared to the government auditors without accounting education background. Therefore, hypothesis two is supported.

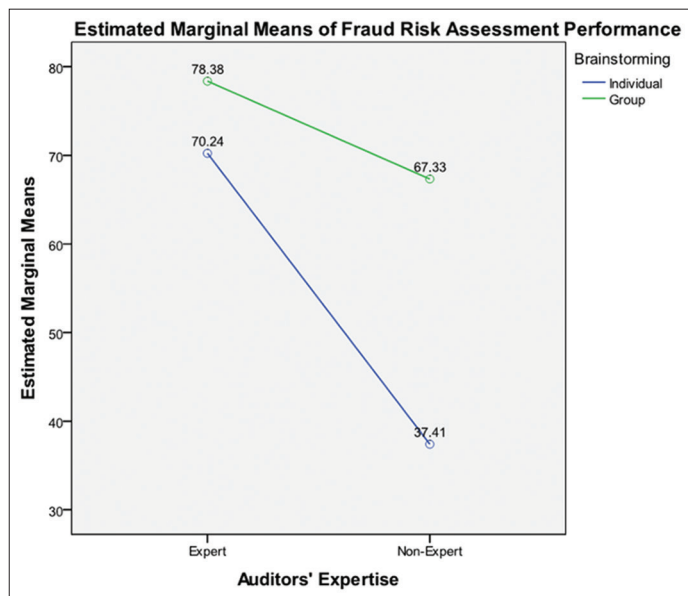
4.5. Interaction between Brainstorming, Auditors Expertise and Fraud Risk Assessment

A two-way between-group analysis of variance was conducted to explore the interaction effects between brainstorming and auditors' expertise against the performance of fraud risk assessment using tests of controls. The results show that brainstorming and auditors' expertise have significant interaction effects on 5% ($F = 4.715, p = 0.032$). Therefore, hypothesis three is supported. Figure 1 shows that brainstorming group (mean score = 72.32) have a better performance compared to the individuals (mean score = 57.39) in the fraud risk assessment using tests of controls. Individual government auditors without expertise (mean score = 37.41) have a lower performance on the fraud risk assessment using tests of controls compared to individual government auditors with expertise. However, in the brainstorming group, government auditors without expertise (mean score = 67.33) have better performance. The details of the result are shown in Table 2.

Table 2: Interaction effect between brainstorming and auditors' expertise

Source	Type III sum of squares	df	Mean square	F	Significant	Partial eta squared
Corrected model	28538.908 ^a	3	9512.969	10.405	0.000	0.175
Intercept	583036.521	1	583036.521	637.702	0.000	0.813
Expertise	17485.497	1	17485.497	19.125	0.000	0.115
Brainstorming	13161.593	1	13161.593	14.396	0.000	0.089
Expertise*brainstorming	4310.920	1	4310.920	4.715	0.032	0.031
Error	134398.840	147	914.278			
Total	810700.000	151				
Corrected total	162937.748	150				

a. $R^2=0.175$ (Adjusted $R^2=0.158$)

Figure 1: Interaction effects between brainstorming and auditors' expertise

5. DISCUSSION AND LIMITATIONS

This study examines the effect of brainstorming and auditors' expertise on the performance of fraud risk assessment. The results indicate that government auditors without expertise may improve their performance when the brainstorming process is provided. The results show that there is a significant interaction between auditors' expertise and brainstorming. In other words, brainstorming improves the performance of fraud risk assessment using tests of controls without taking into account the expertise of the government auditors. The findings in this study are consistent with previous studies related to brainstorming in an audit context (Alon and Dwyer, 2010; Carpenter, 2007; O'Donnell et al., 2000). Even though the psychology literature found brainstorming may cause production block and social loaf (Diehl and Stroebe, 1987), the results of this study shown otherwise. This study indicates that in the context of an audit, the performance of fraud risk assessment using tests of controls is improved in the brainstorming group. In addition, a government auditor with expertise has a better performance compared to a government auditor without expertise. Furthermore, the brainstorming group also performed better than an individual. However, government auditors without expertise performed the fraud risk assessment using tests of controls individually obtained lower scores. Therefore, a brainstorming needs to be emphasized to the practitioners especially the

government auditors. This study implicates that an audit judgment made by a government auditor in brainstorming indirectly improve audit quality. As a conclusion, brainstorming needs to be intensified in the audit planning process.

However, the findings in this study need to be enhanced by creating mixed group between government auditors with expertise and government auditors without expertise. The absence of a mixed group is a limitation of this study. Therefore, future research needs to use a factorial design experiment 3×2 . Where there is, a mixture in a group consisting of government auditors with expertise and government auditors without expertise are added. The results might be able to explain how production block and social loaf could be reduced during the brainstorming process caused by the diversity of auditors' expertise.

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