



Audit judgment performance: assessing the effect of performance incentives, effort and task complexity

Zuraidah Mohd-Sanusu

Faculty of Accountancy, Universiti Teknologi MARA, Shah Alam, Malaysia, and

Takiah Mohd-Iskandar

*Faculty of Economics and Business, Universiti Kebangsaan Malaysia,
Bangi, Malaysia*

Abstract

Purpose – This study examines the mediating effect of effort on the relationship between performance incentives and audit judgment performance under different levels of task complexity.

Design/methodology/approach – Using an experimental research design, subjects are randomly assigned to three performance incentive groups: control, financial and feedback. Each subject is required to perform two experimental tasks of two complexity levels (low and high).

Findings – Results indicate that performance incentive variables are positively related to audit judgment performance. Hierarchical regressions of moderated-mediation analyses support the hypotheses that the mediation effect of effort on the relationship between performance incentives and audit judgment performance occurs under low task complexity and not under high task complexity. In other words, the positive relationship between effort and audit judgment performance is weakened under high task complexity.

Research limitations/implications – The external validity of this study is limited since the audit case contains less information than the real audit environment. This study contends that the expectancy theory can in fact be used to generate empirical prediction on audit judgment performance. The reliance on expectancy theory to supply theoretical mechanism by including the moderating variables provides explanation on when effort should and should not have positive effects on audit judgment performance.

Practical implications – Audit firms need to be careful on the performance incentives offered because incentives affect job output quality. Performance incentives may reduce job turnover and job tension among auditors. In addition, audit firms should ensure that the auditors have proper training to increase their skills and knowledge to help auditors to carry out various job complexities.

Originality/value – This paper can enhance knowledge and understanding on how motivational and environment factors influence audit judgment performance.

Keywords Auditing, Incentives (psychology), Task analysis, Financial analysis

Paper type Research paper



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1. Introduction

Auditors in public audit firms are facing difficult challenges in completing audit tasks (Snead and Harrell, 1991). Some of the challenges arise from the nature of the job itself such as work pressures, inadequate resources or manpower and task uncertainties. These challenges lead to lack of consensus among auditors and inaccuracy in audit judgment, which in turn affects the quality of audit judgment (Trotman, 1998). In improving audit judgment quality, audit firms have recognized the importance of performance incentives through the implementation of better pay schemes, promotions and benefits (Jeffords *et al.*, 1997). The use of performance incentives may exert additional effort and attain higher levels of performance (Libby and Lipe, 1992). Hence, the commitment of audit firms to offer performance incentives can increase auditors' motivation, manage auditors' behaviors and improve productivity.

Although past accounting studies have examined the relationship between performance incentives and audit judgment performance, empirical evidence examining effort directly as a mediator is still limited (Bonner and Sprinkler, 2002). Performance incentives increase effort (i.e. cognitive and/or duration), which in turn, maps into an increased performance (Libby and Lipe, 1992). Most of past literatures show that performance incentives improve effort, but mixed evidences are found on the effect of effort on judgment performance (Awasthi and Pratt, 1990; Chang *et al.*, 1997; Cloyd, 1997; Libby and Lipe, 1992). One possible explanation is the different levels of audit task complexity performed by auditors. As suggested by Libby and Lipe (1992), audit judgment performance is not only affected by the type and amount of incentives offered but also on the level of task complexity. This means that auditors have difficulties in making judgments for various audit tasks with numerous types of information and insufficient procedures to follow. As such, the inherent complexity of the audit tasks and effort are important factors to affect audit judgment performance.

Examination of these two issues would address the call for additional studies by Libby and Luft (1993) and Bonner (1994) on the role of motivation and task complexity on audit judgment performance and Bonner and Sprinkle (2002) on the role of effort to explain the relationship. The objectives of this study are firstly to examine the relationship between performance incentives and audit judgment performance and secondly to examine the mediating effect of effort on the relationship between performance incentives and audit judgment performance under different levels of task complexity. The study uses the lenses of the expectancy theory (Kopf, 1992; Vroom, 1964) to explore the relationship between performance incentives and audit judgment performance.

This study extends the previous studies in a number of ways. Firstly, this study uses multiple performance incentives by including financial and non-financial incentives. Most of the past studies focus on a single type of incentive except for Ashton (1990). Secondly, different levels of task complexity provide a joint consideration with performance incentives inducing various levels of effort, which in turn, may affect performance directly. This study investigates whether effort mediates the relationship between performance incentives and performance directly. Finally, using hierarchical regression analyses, this research study attempts to uncover the plausible explanation of effort as a mediating variable which is very much dependent on task complexity (moderated mediation effect).

The remainder of this paper is organized as follows. The next section discusses prior literature concerning the relationships of performance incentives and task complexity on audit judgment performance and the development of hypotheses. This is followed by the methodology of the experimental task, administration procedures and participants. Results of the statistical tests are then presented. Finally, the last section presents a discussion of the research findings; implications and suggestions for future research in audit practice; with some limitations of this study.

2. Literature review and hypotheses

Over the past two decades, substantial progress has been made in discovering the factors affecting the quality of auditors' judgment performance. These studies examine factors such as memory, knowledge and experience affecting judgment performance (Awasthi and Pratt, 1990; Libby and Lipe, 1992; Tan and Libby, 1997; Tan *et al.*, 1997; Ramsay, 1994). In addition to characteristics of the decision maker, other variables such as task and performance incentives have also gained increasing attention.

2.1 Effects of performance incentives on audit judgment performance

Motivation is a necessary component of performance because it inspires correct behaviors that can lead to high performance (Vroom, 1964). It can be classified into two types; intrinsic and extrinsic. Intrinsic motivation concerns doing a task out of interest and enjoyment, or as a willingness to engage in a task for its own sake because it results in a sense of self-determined competence; extrinsic motivation involves engaging in a task not for its own sake but to reach some desired end state (Cellar *et al.*, 1993; Ryan and Deci, 2000; Wigfield and Eccles, 2000). Motivation that is generated by perceptions of utility or instrumentality is inherently extrinsic (Ryan and Deci, 2000). Previous studies have found that the presence of extrinsic motivation (i.e. performance incentives) may increase the effect of intrinsic motivation on performance (Jordan, 1986). Incentive-based compensation is used frequently by organizations to improve overall performance, with the most commonly used performance incentives in organizations being financial and non-financial incentives (Stajkovic and Luthans, 1997).

A long history of experimental literature generally supports the common belief that financial incentives affect performance across a wide variety of tasks (Ashton, 1990; Awasthi and Pratt, 1990; Bailey *et al.*, 1998; Libby and Lipe, 1992). For non-financial incentives, several mechanisms such as accountability or justification were applied in previous studies (Peecher, 1996; Chang *et al.*, 1997; Kennedy *et al.*, 1997; Kennedy, 1993; Tan and Kao, 1999; Tan *et al.*, 2002), together with feedback (Ashton, 1990; Kovar, 1996; Leung and Trotman, 2005). These studies support the contention that both financial and non-financial incentives improve audit judgment performance. Although past studies have examined the effect of various types of incentives individually, researchers have yet to investigate the concurrent effects of multiple performance incentives on audit judgment performance. As such, this study will focus on two types of performance incentives: financial and feedback.

Under financial incentives, mixed results were reported on the relationships between financial incentives and audit judgment performance. Awasthi and Pratt (1990) and Libby and Lipe (1992), do not find evidence to support the positive effect of financial incentives on audit judgment performance. On the other hand, Ashton (1990)

has found that financial incentives could improve task performance when subjects did not receive decision aid (high task complexity). However, no significant effect of financial incentives on task performance was noted when the subjects were given decision aid (Ashton, 1990).

Feedback usually refers to information regarding a level of performance and/or the manner and efficiency in which performance processes have been executed (Stajkovic and Luthans, 2001). The feedback given by the superior to subordinates stimulates audit judgment performance. Specifically, for an audit task, a feedback given to an auditor may cause the auditor to be more conservative. Hence, they will be more responsible and allocate more effort in performing the job. As discussed by Turner (2001), auditors will exhibit conservatism and be more comprehensive in search strategy. Past evidence provides support of the effect of feedback on performance in general (Earley *et al.*, 1990; Stajkovic and Luthans, 2001). Furthermore, in accounting research, feedback appears critical for a successful audit judgment performance.

Consequently, performance incentives (financial and feedback) should be associated with better audit judgment performance. This leads to the following hypothesis:

- H1.* Subjects with performance incentives perform better audit judgments than subjects without any incentives.

2.2 Effects of performance incentives on effort

Several explanations have been provided for the robust effect of performance incentives on audit judgment performance. In order for performance incentives to improve audit judgment performance, past studies have shown that the task must provide some mechanism through which effort affect performance (Libby and Lipe, 1992; Kennedy, 1993). Motivation itself is not effort; rather, motivated individuals may expend effort (Carlson, 2000). The amount of cognitive effort spent on a task can be increased through effort duration (e.g. working longer time) or effort intensity (e.g. working harder), or both (Cloyd, 1997). As posited by expectancy theory, the performance-contingent incentives induce higher levels of effort by increasing the expected utility of the outcome.

Prior empirical studies in accounting have demonstrated that performance incentives cause individuals to increase the amount of effort they devote to the audit task. Awasthi and Pratt (1990) have found that monetary incentives would increase the effort of all subjects. Subjects search for additional information, perform additional supporting computations, or carefully attend the task (Awasthi and Pratt, 1990). Similarly, Libby and Lipe (1992) have also examined the effects of monetary incentives on audit judgment performance. Their results show that monetary incentives increase the effort devoted to cognitive tasks. In addition, Chang *et al.* (1997) have examined justification as non-financial performance incentives that may influence the effort process. They have found that justification increased effort duration. Thus, when subjects are given incentives to complete the task performance, they are expected to increase the amount of effort they devote to the task. The following hypothesis is proposed:

- H2.* Subjects with performance incentives exert more effort than subjects without any incentives.

2.3 *The role of task complexity as a moderator*

The effects of effort on audit judgment performance cannot be generalized across different tasks complexity. According to Wood (1988), task complexity can be defined as a function of three dimensions of the task itself:

- (1) number of distinct components and informational cues necessary for completion of the task;
- (2) complication on the patterns of relationships among informational cues, actions, and products; and
- (3) stability of those patterns are over time.

Usually, complex tasks are ill-structured, ambiguous, and difficult. Campbell (1988) has argued that tasks become more complex when there are inconsistency of cues and a decision maker is not able to integrate incongruent cues. Certain tasks may be ambiguous or difficult due to communication break-down (Campbell, 1988).

Some audit tasks are considered highly complex and difficult while others are perceived to be relatively straight forward and easy (Jiambalvo and Pratt, 1982). An increase in task complexity may lead to improper application of knowledge which impairs the audit judgment performance (Bonner, 1994). Consequently, auditors perform differently on audit tasks assigned to them. Some of the past studies have associated task complexity with the characteristic factors such as experience (Abdolmohammadi and Wright, 1987; Chang *et al.*, 1997), gender (Chung and Monroe, 2001) and knowledge (Tan *et al.*, 2002). Others have linked task complexity with environmental factors such as familiarity with preparer (Asare and McDaniel, 1996), pressure and ranking (Moreno and Bhattacharjee, 2003), and also justification or accountability (Chang *et al.*, 1997; Tan *et al.*, 2002). However, very limited audit studies that have examined the interaction effect of task complexity and effort on audit judgment performance. This interaction could possibly explained on the weak relationship between effort and audit judgment performance found in past studies such as Awasthi and Pratt (1990), Libby and Lipe (1992) and Chang *et al.* (1997).

When a task is less complex, financial or non-financial incentives may provide substantial motivation and directional roles through effort (Earley *et al.*, 1990). In other words, for low level of task complexity, additional effort can have direct effects on performance. As more effort is devoted to understanding the problem, more productive information search strategies are likely to be developed (Cloyd, 1997). This would enable an individual to identify more relevant information. Hence, increases in effort will have a greater impact on the effectiveness of individuals in performing tasks of low complexity.

Likewise, in complex tasks (especially skill-intensive tasks), effort does not have a direct or strong impact on performance if auditors do not possess additional skill or experience (Bonner, 1994). When a task is more complex or not well structured, any high effort may not be able to facilitate auditors' search for successful task completion. Consequently, the positive relationship between effort and performance will be moderated for those who have received a "high complex" task but not a "low complex" task. Pelham and Neter (1995) suggest that high levels of motivation increases judgmental accuracy in the case of low levels of task complexity but that judgment accuracy decreases in the case of high levels of task complexity. This suggests that there should be an interaction effect between effort and task complexity on audit judgment performance. Accordingly, the following hypothesis is proposed:

- H3. The relationship between effort and audit judgment performance is moderated by task complexity such that,
 - H3a. When task complexity is low, subjects with high effort show better audit judgment performance than subjects with low effort.
 - H3b. When task complexity is high, there is no difference in audit judgment performance between high effort and low effort groups.

2.4 Model of the study

Past empirical evidence has provided a number of important insights on the inconsistency of auditors' judgment performance under different levels of task complexity and performance incentives (Ashton, 1990; Chang *et al.*, 1997; Libby and Lipe, 1992; Tan *et al.*, 2002). Based on these empirical studies, we have integrated the effect of effort as a mediator and task complexity as a moderator on the relationship between performance incentives on audit judgment performance. This study also builds its conceptual framework from the conceptual review papers of Bonner (1994), Libby and Luft (1993), and Bonner and Sprinkle (2002). Hence, the effect of performance incentives, effort and task complexity on audit judgment performance are examined concurrently.

This conceptual framework is based on the principles inspired by Vroom's (1964) expectancy theory of force model. The force model asserts that:

... the greater the motivational force toward high performance, the more highly motivated the individual will be toward high performance, the more effort they will exert, and the higher their performance will be (Kopf, 1992, p. 133). Expectancy theory has been recognized as one of the most promising conceptualizations of individual motivation (Burton *et al.*, 1993). In general, the theory postulates that an individual receives inputs into his/her decision-making process, the effect of the input on the individual's anticipation of future events is cognitively determined, and motivation is subsequently increased, decreased, or unaffected (Evans *et al.*, 1982). The usefulness of the expectancy model in the field of organizational behavior depends on its ability to describe and predict work motivation, job effort, and job performance.

As shown in Figure 1, path a shows the direct effect of performance incentives on audit judgment performance. Based on the expectancy theory, incentives induce high effort (path b) which in turn affects audit judgment performance (path c). Complex tasks require more cues to be processed (Wood, 1988), and hence results in impaired performance (Bonner, 1994). Path d indicates that task complexity mitigates the effect of

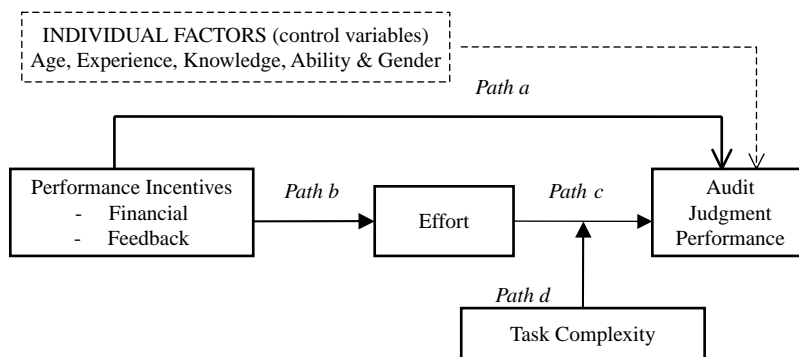


Figure 1. Audit judgment performance model

effort on audit judgment performance. Finally, the dotted line represents several control variables which are found to have significant effects on audit judgment performance.

3. Methodology

This study employs a field experiment method. A between- and within-subjects factorial design was used to test the effects of task complexity and performance incentives with two levels of task complexity and three levels of performance incentives.

3.1 Subjects

Subjects were audit trainees who have undergone one-semester practical training in various audit firms. They were students at a large public university in Malaysia recruited from advanced audit courses. Ten trainees had incomplete data due to failure to follow the experimental procedure ($n = 1$) and no response in the task given ($n = 9$). Data for these cases were deleted from all analyses. The analysis sample consisted of 77 audit trainees with an average age of 23 years old. Subjects were randomly assigned to one of the three experimental groups: control group with no incentives given, feedback incentives group and financial incentives group.

3.2 Tasks

This study adopts Bonner and Lewis' (1990) internal control evaluation tasks. This same material was tested in Tan and Kao (1999) and Tan *et al.* (2002). The task comprises of two audit cases. The first case measures a low and a medium level of task complexity while the second case measures a high level of task complexity. However, Tan *et al.* (2002) argue that the level of complexity of the second case was high with very few auditors answering the questions. Consequently, this study applied only the first internal audit case to measure the "low" and "medium" level of complexity. The internal controls evaluation tasks require subjects to list compliance and substantive tests and to determine errors concerning liabilities. The details of both tasks are included in the Appendix. For each task, subjects were instructed to list as many solutions as possible.

The research instrument was pre-tested on three auditing lecturers and two practicing auditors to ensure that the information and narratives in the case were realistic in performing the audit task.

3.3 Measurements

3.3.1 Performance incentives. Performance incentives were manipulated as a between-subject variable. Subjects were randomly assigned to three motivation groups: no incentives, feedback incentives and financial incentives. Subjects of the control group were not required to write down their names. They received a pen each as a token of appreciation for participating in the study. On the other hand, subjects of the feedback incentive group were required to write down their names. They were informed that their responses would be graded by their respective audit lecturers and marks would be given as their on-going assessment marks in the final grade of their audit course. Subjects of the financial incentive group were offered five ringgit Malaysia (RM5). This monetary reward was given as financial incentives if they successfully performed the audit tasks.

3.3.2 Effort. The amount of time worked is a relevant behavioral measure of effort (Vroom, 1964). Effort is measured using the amount of time spent (duration) in the

experimental tasks. The use of effort duration in audit experiment was previously applied in Jiambalvo (1979) and Libby and Lipe (1992). The subjects are required to state the time began and the time they ended the tasks. On average, subjects took 26.8 minutes to complete all tasks.

3.3.3 Task complexity. Task complexity is a within-subject variable, manipulated by having subjects perform two tasks with different levels of complexity. For the low complexity task, subjects were required to list compliance tests to ascertain whether the clients' controls on payables and liabilities were effective, and to list substantive test to search for unrecorded liabilities. This task is relatively low complexity because subjects are only required to recall specific procedures without the need to examine the importance of the information. Next, for the high complexity task, subjects were asked to generate possible financial statement errors arising from control weaknesses in the accounts payable system. They were required to determine the error, the accounts affected, and whether these accounts would be overstated or understated. This task is more complicated than the first since subjects need to understand the scenario, examine various cues and think of several possibilities.

3.3.4 Audit judgment performance. Audit judgment performance was measured by the number of correct responses. For the low complexity task, the evaluation of audit judgment performance is based on the number of correct substantive and compliance tests listed. For the high complexity task, the performance is determined by the number of plausible errors. Responses are considered plausible if occurrence of errors, accounts that would be affected and the magnitude of errors are correctly stated. Responses are implausible if they do not fulfill all the criteria for the plausible responses.

3.4 Control variables

Although the subjects were randomly assigned to one of the three motivation groups, the ratio of females and males and the level of academic ability were not similar among the groups. Hence, this study includes gender and academic ability as control variables. Past studies also supported that both of these variables are significantly related to audit judgment performance (Chung and Monroe, 2001; Chang *et al.*, 1997). About 70 percent of the subjects were female with an average score in the academic performance (CGPA) of 2.93. Subjects of the three groups are equivalent in terms of age, experience and knowledge.

3.5 Manipulation check

This study includes two questions for the simple task (compliance and substitution tests) and one question for the complex task to check for the level of task complexity. Kernan *et al.* (1994) support task complexity manipulation using self-check questions together with the instrument. All of the questions are measured using a nine-point Likert scale (e.g. 1 – not at all complex; 9 – extremely complex). The items consisted of questions on the degree of complexity in performing the specific tasks.

For the performance incentives manipulation, subjects were asked how motivated they were to perform well on the task. The questions were measured using a nine-point Likert scale (e.g. 1 – not at all motivated; 9 – extremely motivated). Subjects in the feedback and financial groups were also asked on the extent to which they thought their responses would be given feedback or financial incentives, respectively. The questions were measured using a nine-point Likert scale (e.g. 1 – least likely; 9 – most likely).

3.6 Procedures

Each subject received a booklet comprising the narratives of cases, instructions and questions on an internal control evaluation. The experiment was conducted during their audit class time and closely monitored by one of the author. Subjects were told that they were participating in an audit task experiment, and all received similar materials. Performance incentives manipulation was introduced just before they started the experimental audit tasks. Subjects were also given a debriefing questionnaire containing background information and manipulation check questions. They were advised not to collaborate with their classmates. However, they were allowed to refer to their audit textbook if necessary.

3.7 Analysis

This study examines the effects of a mediator and a moderator on audit judgment performance. For the moderation effect, an analysis of covariance was performed to test for the direct and interaction effects of performance incentives and task complexity on audit judgment performance. The technique also allows for the inclusion of control variables (gender and CGPA) in the analysis. For the mediating effect, three steps of multiple regressions recommended by Baron and Kenny (1986) and Frazier *et al.* (2004) were applied. Prior research has also employed this technique when performing mediation analysis (Becker, 1997; Earley *et al.*, 1990). Since, this study examines the effect of a mediator and a moderator simultaneously, this three-step technique is analyzed through a hierarchical regression analysis. For the manipulation checks, the researcher examines the means, the standard deviations and the analysis of variance (ANOVA) test for complexity and motivation manipulation questions.

4. Results

4.1 Descriptive analysis and manipulation checks

Table I presents descriptive statistics on effects of the three incentive conditions on audit judgment performance. The number of subjects in each group is almost equal. The average time spent (effort duration) ranges from 22.9 to 29 minutes for different incentive groups. Table I, also shows the mean scores for the two tasks performed by each subject. At the low level of task complexity, both the financial and the feedback groups scored higher (average score 6.19 and 6.36, respectively) than the control group (average score 4.34). However, for the high task complexity, financial incentive group performed slightly better (average score 4.07) than the control and feedback groups (average score 3.26 and 3.24, respectively).

A one-way ANOVA was performed on the manipulation check of performance incentives and task complexity. Based on ANOVA, results show that the three incentive

Table I.
Descriptive statistics and mean (standard deviation) of effort and audit judgment performance

Performance incentives group	Sample size	Effort duration (minute)	Task 1 (low level of task complexity) compliance and substantive tests	Task 2 (high level of task complexity) identification of error
No incentive	26	22.9	4.34 (1.71)	3.26 (1.83)
Financial	26	29.0	6.19 (2.39)	4.07 (1.75)
Feedback	25	28.5	6.36 (1.44)	3.24 (1.71)
Overall	77	26.8	5.70 (2.11)	3.26 (2.09)

conditions showed a significant difference ($F = 3.262, p < 0.05$). These analyses suggest that the manipulation for the performance incentives is a success. Similarly, results indicate that the ratings were significantly different between low and high complex tasks. Based on a paired samples test, the mean score for the manipulation check on the low complexity task was significantly different from the high complexity task ($t = -2.774, p < 0.01$). These results strongly support the effectiveness of the performance incentives and task complexity manipulation.

4.2 Correlation analysis

Table II depicts the correlation coefficients for all variables. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity (Pallant, 2001). The bivariate correlation coefficients indicate support for the effects of performance incentives, effort and control variables on audit judgment performance. Results also suggest that variables are not highly inter-correlated so that multicollinearity is not a serious concern.

4.3 Hierarchical regression analysis

A hierarchical regression analysis was performed to examine the direct effect of performance incentives, the mediating effect of effort and the moderating effect of task complexity on audit judgment performance. Since, there are three-condition treatments, no incentive (control group), feedback incentive and financial incentive, two-code variables were created to fully represent the categorical variable of treatment type in the regression equation (i.e. feedback and financial) using a dummy coding (Frazier *et al.*, 2004).

Table III depicts the analysis of moderated mediation effects of effort and task complexity. In all equations, the control variables, gender and CGPA, were the first block entered. Both of the control variables, gender and CGPA, significantly influenced the dependent variable ($p < 0.001$). They explain 7.7 percent of the variance in the audit judgment performance. In fact, they were consistently significant factors to influence the performance across the three models.

	1	2	3	4	5	6
1. Audit judgment performance – low task complexity	–	–	–	–	–	–
2. Audit judgment performance – high task complexity	0.225 *	–	–	–	–	–
3. Financial incentive ^a	0.151	0.260 *	–	–	–	–
4. Feedback incentive ^b	0.225 *	0.173	-0.499 **	–	–	–
5. Effort	0.265 *	0.037	0.281 **	0.236 *	–	–
6. CGPA	0.083	0.393 **	0.114	-0.142	-0.181	–
7. Gender ^c	-0.213 *	-0.202	-0.084	-0.122	0.125	0.065

Notes: *Significant at the 0.05 level; **significant at the 0.01 level; ^a0 – no financial incentive, 1 – received financial incentive; ^b0 – no feedback incentive, 1 – received feedback incentive; ^c0 – male, 1 – female

Table II. Correlations for all variables ($n = 77$)

Testing steps in mediation model	<i>B</i>	SE <i>B</i>	ΔR^2	<i>F</i> change
<i>Testing step 1 (path a)</i>				
<i>Dependent</i>				
Performance				
<i>Control</i>				
Gender ^a	-0.758 [*]	0.393		
CGPA	1.458 ^{***}	0.530	0.077	7.05 ^{***}
<i>Independent</i>				
Financial ^c	1.150 ^{***}	0.434		
Feedback ^b	0.785 [*]	0.431	0.038	3.62 ^{**}
<i>Testing step 2 (path b)</i>				
<i>Dependent</i>				
Effort (duration)				
<i>Control</i>				
Gender	3.418 ^{***}	0.743		
CGPA	-3.044 ^{***}	0.987	0.050	4.52 ^{**}
<i>Independent</i>				
Financial	7.252 ^{***}	0.830		
Feedback	6.423 ^{***}	0.810	0.331	45.59 ^{***}
<i>Testing step 3 (paths c and d)</i>				
<i>Dependent</i>				
Performance				
<i>Control</i>				
Gender	-0.898 ^{***}	0.351		
CGPA	1.586 ^{***}	0.459	0.077	7.05 ^{***}
<i>Mediator</i>				
Effort (duration)				
<i>Independent</i>				
Financial	0.858 [*]	0.440		
Feedback	0.524	0.424		
Task complexity ^d	0.614	1.454	0.290	18.94 ^{***}
Effort <i>x</i>				
Task complexity	-0.110 ^{**}	0.053	0.016	4.25 ^{**}

Table III.

Regression analysis on audit judgment performance

Notes: ^{*} $p < 0.10$; ^{**} $p < 0.05$; ^{***} $p < 0.01$; ^a0 – male, 1 – female; ^b0 – no feedback incentive, 1 – received feedback incentive; ^c0 – no financial incentive, 1 – received financial incentive; ^d0 – low complexity, 1 – high complexity; CI = confidence interval

In testing the mediation effect, this study follows the three-step regressions as suggested by Baron and Kenny (1986). Step 1 examined the direct effects of performance incentives on audit judgment performance. The unstandardized regression coefficients associated with the effect of financial ($B = 1.150$, $p < 0.01$) and feedback ($B = 0.785$, $p < 0.10$) were significant, respectively. Path a (Figure 1) was significant, and the requirement for mediation in step 1 was met. The performance of subjects who received financial incentives and feedback incentives were higher than the control group. Hence, subjects with performance incentives perform better audit judgments than subjects without any incentives ($H1$ is supported).

In step 2, effort (the hypothesized mediator) was regressed on the performance incentives ($H2$). The unstandardized regression coefficients ($B = 6.423$; $B = 7.252$) associated with these relations were also both significant at the $p < 0.01$ level.

The condition for step 2 was met (path b was significant). Hence, subjects who received performance incentives exert more effort than subjects without any incentives.

The next step, step 3, is to regress audit judgment performance simultaneously on both effort (mediator) and the performance incentive variables (predictors). However, in performing step 3, the researcher has entered not only the mediator (i.e. effort) but also the interaction factor of effort and task complexity. In this case, the effect of effort as a mediator varies across the levels of task complexity (moderator). As discussed by Baron and Kenny (1986) and James and Brett (1984), moderated mediation refers to instances in which the mediated relation varies across levels of moderator. The result shows that effort influenced the model significantly ($B = 0.095, p < 0.05$). Thus, the condition for step 3 was met (path c was significant). A significant indirect effect (path c) indicated that a significant amount of the independent variable's total effect on the dependent variable occurs through the mediator. This implies that effort mediates the relationship between performance incentives and audit judgment performance.

The significance or non-significance of the direct effect in this model can be used as a basis for conclusion about full versus partial mediation (calculate Z statistic[1]). The result shows that the significance tests regarding the relationships between financial incentives ($B = 0.858; z = 2.12, p < 0.05$) and audit judgment performance indicated a partial mediation of effort. Similarly, the significance test for feedback incentives on audit judgment performance ($B = 0.524; z = 2.11, p < 0.05$) showed that effort would also mediate partially. This suggests that both of the performance incentives given to the subjects caused audit judgment performance to increase both directly and indirectly (through effort).

In addition to the mediation effect of effort, results in step 3 also demonstrated evidence on the interaction effect of effort and task complexity. The unstandardized regression coefficient for the interaction between effort and task complexity was $-0.110 (p < 0.05)$. This interaction term explained an additional 1.6 percent of the variance in audit judgment performance over and above the 29.0 percent explained by the main effects of effort and task complexity alone. Results in step 3 show that task complexity interacted with effort to moderate audit judgment performance (path d). Hence, $H3$ was supported.

To understand the form of the interaction, it was necessary to explore it further. Figure 2 shows the predicted values for audit judgment performance at the mean and at low (-1 SD from the mean) and high (1 SD from the mean) values of effort for the two levels of task complexity[2]. Effort exhibits a positive relationship with audit judgment performance under low level of task complexity. It can be concluded that subjects under performance incentive conditions are more likely to exert more effort, which in turn leads to better audit judgment performance when the task is less complex ($H3a$). On contrary, a very modest negative relationship between effort and audit judgment performance is shown under high level of task complexity. Increase in effort is less likely to influence better audit judgment performance under complex task ($H3b$). Thus, performance incentives only improve audit judgment performance under low task complexity through the increase in the level of effort.

5. Conclusion

5.1 Discussion

This study was conducted to assess the effects of performance incentives and effort on audit judgment performance under different levels of task complexity.

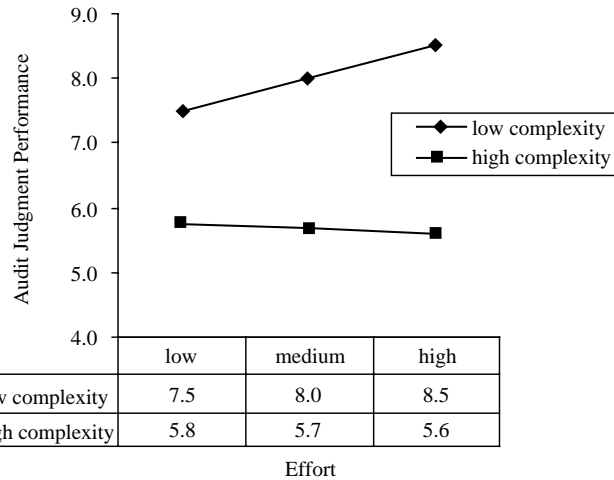


Figure 2.
Interaction between effort
and task complexity

The results indicate that performance incentives increase audit judgment performance. In other words, the results support that both financial and feedback incentives improve audit judgment performance as compared to no incentive group. Results of this study were consistent with Libby and Lipe (1992) and Chang *et al.* (1997) such that the presence of performance incentives (financial and non-financial) increase effort duration. Financial incentives and non-financial incentives motivate higher levels of effort.

To explain further how effort affects audit judgment performance, this study examines the moderating effect of task complexity. Given less complex tasks, high effort would lead to high audit judgment performance. When a task is well structured or well learned, a specific feedback may provide substantial motivation and directional roles through both effort and strategy development (Earley *et al.*, 1990). However, for more complex tasks, high effort does not improve audit judgment performance significantly. Increase in effort did not improve audit judgment performance for complex tasks due to the difficulty in solving the more complex application problems (Chang *et al.*, 1997). At a certain level of task complexity, additional effort induced from the incentives may result in high pressure and arousal, which would impair performance (Ashton, 1990). Using a moderated-mediation analysis, the results indicate that effort partially mediate the performance incentives and audit judgment performance relationship under different levels of task complexity. Results provide a strong support for this hypothesis. It can be implied that different levels of task complexity mitigate the effort level which would contribute to improve audit judgment performance.

5.2 Theoretical and practical implications

These results make a theoretical contribution to the audit judgment performance literature. First, this study contends that expectancy theory can in fact be used to generate empirical prediction on audit judgment performance. The reliance on expectancy theory to supply a theoretical mechanism by including the moderating variables provides explanation on when effort should and should not have positive

effects on audit judgment performance. Second, rather than examining the moderating effect of task complexity on the motivation-performance relationship, this study delineates the possibility of interaction between effort and task complexity. Performing a moderated mediation analysis helps to discover the inconsistent past findings regarding the effect of effort on audit judgment performance.

The research results also have implications for practice. First, in terms of ensuring that performance incentives meet the need of the employees, audit firms need to be careful of the incentives offered because incentives affect job output quality. This effect would be different for different groups of auditors. Financial incentives may have less motivating potential if high pay is already present especially for professional and managerial jobs (Stajkovic and Luthans, 2001). Feedback should play a vital role for individuals at these levels. Furthermore, performance incentives also may reduce job turnover and job tension among auditors. Second, varying levels of task complexity assigned to the auditors may not produce the same quality. The results of this study show that the differences in the audit task complexity interact with other factors. Audit firms should ensure that the auditors have proper training to increase their skills and knowledge to help auditors to carry out various job complexities.

5.3 Limitations and future studies

There are several limitations for this research study. First, the external validity of this study is limited since the case contains less information than the real audit environment. In the real audit environment, much richer information will influence audit judgment performance. Second, this study included primarily audit trainees from accounting degree students with a modest sample size. The use of audit trainees must be interpreted with caution and reservation (Abdolmohammadi and Wright, 1987). Variables such as the level of expertise among the auditors may influence the performance. Recognizing the importance of experience and knowledge in influencing audit judgment, these two factors are thus considered as control variables in this study. Last but not least, the measurement of the variables chosen may have multi-dimensional effect. For example, past literature has measured feedback through several constructs such as outcome, process, task properties, and cognitive (Earley *et al.*, 1990; Leung and Trotman, 2005). Future studies should attempt to replicate and elaborate using larger and more varied samples performing under a variety of different audit task conditions. This would enhance the external validity of the findings.

This research study acts as a preliminary understanding on the nature of motivation and task complexity in audit judgment performance. Future studies can investigate how and when auditors encounter different types of motivation. For example, factors such as goal commitment, goal level, and incentive level have been examined by Wright (1992) to explain the extent of incentive type on performance. In addition, it would be beneficial to examine the interaction between multiple levels of task complexity and other elements of judgment outcome. Extending the levels of task complexity manipulated would provide better understanding when the number of cues is increased (Chung and Monroe, 2001). Additional research is also needed to explore the role of other contextual factors such as industrial effect or familiarity with the task. The results of such research can enhance our knowledge of the specific conditions under which such environmental factors impact auditors' decisions.

Notes

1. $Z \text{ score} = [a \times b] / \sqrt{(b^2 sa^2 + a^2 sb^2 + sa^2 sb^2)}$; If $z \text{ score} > 1.96$, at $\alpha = 0.05$, then effort mediates the relationship. a and b , unstandardized regression coefficients of path a and path b; sa and sb , standard error of path a and path b.
2. Predicted values were obtained for each group by multiplying the respective unstandardized regression coefficients for each variable by the appropriate values for each variable in the equation (Frazier *et al.*, 2004).

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Appendix: Research instrument

Techno Sdn. Bhd. was founded in Malaysia in 1980. Your firm audited Techno for the first time in 1994, and gave an unqualified opinion on its financial statements. Techno purchases computer components to assemble computers. Except for low value components, the perpetual inventory system is used to account for high value components and finished goods. Inventories are carried at the lower of cost or market value. Cost is determined by the FIFO method.

Task 1a: listing compliance tests

The client claims that Techno has internal controls to ensure that recorded liabilities on purchases are for goods and services received, and is consistent with the best interest of Techno. What compliance tests (tests of controls) can you perform to ascertain that the controls are present and effective? Please list *as many* compliance tests as you can think of.

Task 1b: listing substantive tests

What substantive tests will you carry out to search for unrecorded liabilities at year end? Please list in the spaces below *as many* substantive tests as you can think of.

Task 2: listing financial statement errors

Table AI is an internal control questionnaire completed by an audit assistant, Evelyn, in the audit team. The internal controls relate to the accounts payable aspect of Techno. Owing to time

Questions	Yes	No	Remarks
i Are purchase orders approved by designated personnel?	√		
ii Are receiving, accounts payable, stores and purchasing segregated?	√		
iii Are purchase orders issued in prenumbered order and the sequence independently checked?	√		
iv Are goods compared to purchase orders before acceptance?	√		
v Are receiving reports, purchase orders, and invoices matched before the payable is recorded?	√		
vi Are invoice extensions and footings checked?	√		
vii Are receiving reports issued in prenumbered order and in sequence independently checked?		√	Prepared but not numbered; large number of receipts

Table AI.

constraints, an exhaustive list of all possible controls is not given. Please focus only on the controls that are listed in Table AI.

Based on the questionnaire alone (Table AI), list as many financial statement errors that could occur but could not be detected by the internal controls over accounts payable. In listing each of these errors, please describe:

- what is the error and how it can occur;
- what accounts would be affected; and
- whether those accounts would be overstated or understated.

Corresponding author

Zuraidah Mohd-Sanusi can be contacted at: zuraidahms@hotmail.com