

# Effects of Audit Specialization on Audit Planning, Audit Quality and Audit Performance: A Comparative Study of Certified Public Accountants and Tax Auditors in Thailand

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## บทคัดย่อ

The objective of this study is to investigate the effects of audit specialization on audit planning, audit quality and audit performance of certified public accountants and tax auditors in Thailand. In this study, 243 certified public accountants and 217 tax auditors in Thailand are the samples of the study. In the results of the study, audit specialization has a significant effect on audit planning and audit quality. Audit planning has an important impact on audit quality while audit quality is a critical influence on audit performance. However, audit planning is related to audit performance in the tax auditors, but it is not in the certified public accountants. Likewise, audit quality is a mediator of the research relationships. Surprisingly, audit planning is a research mediator of only tax auditors. Accordingly, tax auditors need to focus on creating auditing planning effectiveness in order to build audit practices' quality under the limitations of their competencies and capabilities in audit operations. In summary, audit specialization plays a significant role in determining sustainable audit outcomes in the long-term and future perspectives.

**Keywords:** Audit Specialization, Audit Planning, Audit Quality, Audit Performance

# ผลกระทบของความชำนาญพิเศษการสอบบัญชีที่มีต่อ การวางแผนการสอบบัญชี คุณภาพการสอบบัญชี และผลการปฏิบัติงานการสอบบัญชี : การวิจัยเปรียบเทียบ ผู้สอบบัญชีรับอนุญาตและผู้สอบบัญชีภาษีอากรในประเทศไทย

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## ABSTRACT

การวิจัยนี้มีวัตถุประสงค์ เพื่อตรวจสอบผลกระทบของความชำนาญพิเศษการสอบบัญชีที่มีต่อการวางแผนการสอบบัญชี คุณภาพการสอบบัญชี และผลการปฏิบัติงานการสอบบัญชีของผู้สอบบัญชีรับอนุญาตและผู้สอบบัญชีภาษีอากรในประเทศไทย ซึ่งในการวิจัยนี้ ผู้สอบบัญชีรับอนุญาตและผู้สอบบัญชีภาษีอากรในประเทศไทย จำนวน 243 คน และ 217 คน ตามลำดับ เป็นกลุ่มตัวอย่างที่ใช้ในการวิจัย ในผลลัพธ์ของการวิจัยพบว่า ความชำนาญพิเศษการสอบบัญชีมีผลกระทบต่อคุณภาพการสอบบัญชีและคุณภาพการสอบบัญชี นอกจากนี้ การวางแผนการสอบบัญชีก็มีผลกระทบต่อคุณภาพการสอบบัญชี ขณะที่คุณภาพการสอบบัญชีมีผลกระทบต่อผลการปฏิบัติงานการสอบบัญชี อย่างไรก็ตาม การวางแผนการสอบบัญชีมีความสัมพันธ์กับผลการปฏิบัติงานการสอบบัญชีสำหรับผู้สอบบัญชีภาษีอากร แต่ไม่มีความสัมพันธ์สำหรับผู้สอบบัญชีรับอนุญาต โดยคุณภาพการสอบบัญชีเป็นตัวแปรกลางของความสัมพันธ์ในการวิจัย และการวางแผนการสอบบัญชีเป็นตัวแปรกลางในการวิจัยเฉพาะผู้สอบบัญชีภาษีอากรอย่างเดียวนั้น ด้วยเหตุนี้ ผู้สอบบัญชีภาษีอากรต้องมุ่งเน้นการสร้างสรรคประสิทธิผลการวางแผนการสอบบัญชี เพื่อก่อให้เกิดการปฏิบัติงานการสอบบัญชีที่มีคุณภาพภายใต้ข้อจำกัดด้านสมรรถนะและศักยภาพในการดำเนินงานการสอบบัญชี ดังนั้นสามารถสรุปผลการวิจัยได้ว่า ความชำนาญพิเศษการสอบบัญชี มีบทบาทสำคัญในการกำหนดความยั่งยืนของผลลัพธ์การสอบบัญชีในระยะยาวและในอนาคต

**คำสำคัญ:** ความชำนาญพิเศษการสอบบัญชี การวางแผนการสอบบัญชี คุณภาพการสอบบัญชี ผลการปฏิบัติงานการสอบบัญชี

## **Introduction**

Recently, auditors have played significant roles in providing a high level of assurance that financial statements present fairly. They have practiced, implemented and utilized their knowledge, skills, competencies, capabilities, and experiences in order to investigate reliability, credibility and usefulness of accounting information according to accounting and auditing standards and other related regulations. Better accounting information quality can enhance stakeholders to achieve more decision-making success and greater outcome and performance. Auditors with effective knowledge and skills can achieve their superior success and performance and possibly create high valuable accounting and other related information to stakeholders and users. Accordingly, auditors need to focus on effective learning, systematic development and continuous improvement of their knowledge and skills. These knowledge and skills can reflect to their specialization in audit works and practices. Auditors with great specialization can help provide best audit practices, gain superior audit quality and achieve sustainable audit success and performance (Li, Xie, & Zhou, 2010). Thus, audit specialization is a key determinant of driving and explaining audit performance. Effects of audit specialization on audit performance and mediating roles of the relationships are logically explored and empirically investigated in this study.

In this study, audit specialization is a main driver of audit planning, audit quality and audit performance in audit works. Audit specialization is defined as an ability of auditors to possess a comprehensive understanding of audit practices and operations through complete and accurate knowledge of a firm's characteristics, businesses and industries which improves and enhances their competencies, capabilities and methods for error detection of unexpected financial statement balance fluctuations (Fleming, Hee, & Romanus, 2014). Auditors with relevant practical experience, education and training in a particular industry can have a great audit specialization. They efficiently detect anomalies, effectively verify consistencies, explicitly improve audit risk assessments, and reasonably facilitate the refinement of the elements of audit knowledge, which can help anticipate potential misstatements.

Auditors with specialization can differently make their functions and effectively offer valuable services to clients. They improve their performance in detecting errors and generating hypotheses about industry-specific errors and increase the markets' perception of earnings quality (Knechel, Naiker, & Pacheco, 2007). Thus, auditors can provide higher-quality audits, receive fee premiums, increase their reputation and attract new clients, and gain economies of scale, efficiency, effectiveness, and outperformed success through holding their specialization. Accordingly, auditors can use specialization to provide best audit practices and activities and create success, survival and sustainability in future and long-term audit works.

Audit specialization plays an increasingly important role in enhancing efficient audit planning, outstanding audit quality and excellent audit performance. Firstly, audit specialization can help auditors provide valuable and effective planning of audit programs. It can help auditors modify planned audit procedures, determine a level of audit staff possesses the required skills and knowledge and set the amount of time required for performing the planned audit procedures (Low, 2004). Accordingly, specialized auditors can improve audit risk assessments and increase the quality of audit planning decisions. They can possibly set and provide more effective and successful audit planning. Then, audit specialization is proposed to positively affect audit planning. Secondly, audit specialization is a significant predictor of audit quality. It can help auditors both discover and report an error or omission that could materially affect a financial statement through compliance with auditing and professional standards and other related regulations in the conduct of the financial statement audit (Elder, Lowensohn, & Reck, 2015). Clients and related stakeholders can utilize their audit works in order to participate firms' operations and activities according to higher audit quality and better earnings quality. Thus, audit specialization definitely improves audit quality. It is hypothesized to positively influence a quality of audit works.

Audit specialization is also an important determinant of audit task performance (Ittonen, Johnstone, & Myllymaki, 2015). It explicitly leads to auditors' effectiveness, performance and success in tasks more commonly encountered in a specific industry. Auditors with high audit specialization can have their good audit operations in order to achieve superior audit performance. Thus, auditors with specialization can provide audit practices, functions and activities well. They tend to achieve higher and more superior sustainable audit performance than non-specialized auditors.

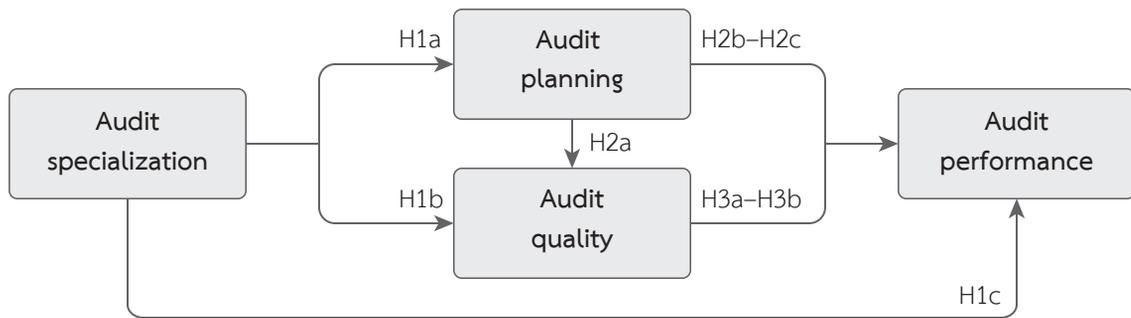
As aforementioned earlier, this study aims at investigating the effects of audit specialization on audit performance of certified public accountants (CPAs) and tax auditors (TAs) in Thailand through mediating influences of audit planning and audit quality. To verify and prove the research relationships, a comparative study is an effective research approach by collecting data from both CPAs and TAs in Thailand. CPAs are professional auditors in Thailand and they have responsibilities to investigate and certify financial statements of all enterprises. In Thailand, TAs are another type of external professional auditors, but they have responsibilities to investigate and certify financial statements of only small registered partnerships. Thus, the comparative study of both CPAs and TAs in Thailand is explicitly interesting because in existing literature, there has been no studies that attempt to investigate the aforementioned relationships of TAs. This study can expand and add the contributions to audit literature, especially in TAs. The key research question is how audit specialization plays a significant role in determining audit performance. The specific research questions are: (1) How audit specialization

is related to audit planning and audit quality, (2) How audit planning is linked to audit quality and audit performance, (3) How audit quality is interacted with audit performance, (4) How audit planning mediates the audit specialization-audit performance relationships, (5) How audit quality mediates the audit specialization-audit performance relationships, and (6) the research results are similar in certified public accountants and tax auditors.

The remainder of this study is organized as follows. The first section describes prior research of audit specialization, audit planning, audit quality, and audit performance and their relationships and the hypotheses development of this study. The second section discusses the sample construction and explains the measurements of the aforementioned variables. The third section explains the research design and the fourth section presents the descriptive statistics on independent, mediating and dependent variables. The fifth section presents the results from the empirical test and the results from the various sensitivity tests, followed by a contribution and conclusion in the sixth section.

### **Relevant Literature Review of Audit Specialization and Its Consequences**

Here, the associations among audit specialization, audit planning, audit quality, and audit performance are verified. According to pragmatic learning theory, an individual can have the acquisitions of knowledge and skills from learning through education, training and experience and participating in communities of practices, societies and situated meanings (Jayanti & Singh, 2010). More knowledge and skills can enhance an individual to perform well in job activities, functions and responsibility. In auditing literature, audit specialization is represented as one kind of effective knowledge and skills from auditors' learning and participation. It explicitly occurs from relevant practical experience, education and training in a particular industry. Auditors with great specialization can provide best practices in their activities, functions and responsibilities. Thus, audit specialization is a key determinant of driving audit performance (Fleming, Hee, & Romanus, 2014). In this study, audit specialization is an independent variable of the study, audit planning and audit quality are mediating variables of the study and audit performance is a dependent variable of the study. Thus, the research relationships of these variables are discussed and hypothesized. The conceptual model presents the aforementioned relationships, as shown in Figure 1.



**Figure 1:** The Research Model of the Audit Specialization-Audit Performance Relationships

**Audit Specialization**

Specialized auditors can provide best audit practices and functions through knowledge and skills in order to improve audit quality and increase audit performance and success. They are likely to build and provide a high level of reliability, credibility, transparency, and usefulness of valuable information from financial statements and reports (Knechel, Naiker, & Pacheco, 2007). Thus, audit specialization is important for audit works. Accordingly, audit specialization is proposed as a key player in determining auditors’ outcome. Thus, this study needs to empirically investigate the effects of audit specialization on audit planning, audit quality and audit performance. Here, audit specialization is defined as an ability of auditors to possess, occupy and own a comprehensive understanding of a firm’s characteristics, qualifications and statuses that can help create their abilities, competencies, capabilities, and methods for error detection of unexpected financial statement balance fluctuations and misstatements (Fleming, Hee, & Romanus, 2014). Formal education, valuable training and practical experience in particular industry are main sources of audit specialization. Also, audit specialization explicitly contributes to auditors’ skills and knowledge, namely complete, accurate and extensive knowledge relating to plausible explanation of their clients’ business environments and industries (Jaggi, Gul, & Lau, 2012). It can help auditors detect anomalies and verify consistencies of financial statements and reports. It is likely to detect and curb earnings management, minimize unintentional errors, generate more industry-unique financial statement error hypotheses, and enhance audit outcomes (Elder, Lowensohn, & Reck, 2015). Auditors with specialization can create valuable information to clients, offer specialized services and receive higher fees due to differentiation premiums (Kwon, Lim, and Tan, 2007). They can obtain a competitive advantage over non-specialized auditors, increase their reputation and attract new clients (Ittonen, Johnstone, & Myllymaki, 2015).

While audit specialization plays a significant role in determining valuable outcomes, this study definitely focuses on audit planning, audit quality and audit performance as its valuable outcomes. Audit specialization can help auditors effectively set and modify the nature of the planned audit procedures and time budgets and efficiently judge the audit procedure changes and the final audit programs and time requirements and budgets (Low, 2004). It improves audit risk assessment and increase the nature, quality and risk-sensitivity of their decisions. Greater audit specialization possibly provides more effective audit planning. Specialized auditors can achieve superior successful audit planning. Thus, audit specialization is positively related to audit planning. The relationships between audit specialization and audit planning are investigated. Likewise, audit specialization is a main determinant of audit quality. It has an increasingly important role in enhancing auditors' quality in audit works through both discovering and reporting an error or omission that could materially affect the financial statements (Elder, Lowensohn, & Reck, 2015). It promotes the degree of auditors' compliances with professional standards and other related issues in the conduct of a financial statement audit. Auditors with specialization can effectively understand and learn these standards and issues from formal education, existing experiences and practical training. Thus, they can provide a high level of information assurance, reliability, credibility, and quality in financial statements. Specialized auditors can provide higher audit quality than non-specialized auditors. In compared with non-specialized auditors, specialized auditors are likely to set and determine audit practices, operations and activities more effectively. Hence, based on specialized audit works, auditors tend to perform audit work well in order to achieve superior audit quality. Accordingly, the effects of audit specialization on audit quality are examined.

In addition, audit specialization is an important driver in determining and explaining audit performance. It is a main determinant of audit task performance (Ittonen, Johnstone, & Myllymaki, 2015). It can create auditors' efficiency, effectiveness, performance and success in audit works. Auditors can utilize their specialization in setting effective audit planning in order to achieve a great audit quality and have a good audit performance. Then, audit specialization positively affects audit performance. The influences of audit specialization on audit performance are verified. As mentioned earlier, audit planning, audit quality and audit performance are valuable consequences of implementing and utilizing auditors' specialization. Accordingly, audit specialization is hypothesized to have a positive impact on audit planning, audit quality and audit performance in this study. Therefore,

H1a: Audit specialization is positively related to audit planning.

H1b: Audit specialization is positively related to audit quality.

H1c: Audit specialization is positively related to audit performance.

**Audit Planning**

Audit planning is the first consequence of implementing audit specialization in audit works. It is hypothesized to have a positive relationship with audit specialization. In this study, audit planning refers to an ability of auditors to make adequate program plan decisions and adequate audit resource allocation decisions under different conditions of risks (Hellman, 2011). It emphasizes a problem of materiality allocation, a scope of risk assessments and a requiring handling of time budgets. Also, audit planning explicitly sets a scope of audit procedures to be performed in order to obtain sufficient evidences on a fairness of reported accounting balances, namely materiality and risk (Bedard, Graham, & Jackson, 2005). It comprises audit program (planned audit procedures and defined sample sizes of planned procedures) and time budget (budgeted engagement hours for each planned procedure and assigned auditor-rank level). It helps estimate relative costs of different audit procedures, promote audit efforts and attempts to the less costly accounts and preserve an effectiveness of audits' practices, functions and activities. Likewise, audit planning develops auditors' expectations about the likelihood of error in the financial statements and designs an audit strategy that is appropriate for the circumstances (Fortvingler & Szivos, 2016). Audit planning obtains client background information, sets materiality level, performs preliminary analytical review, assesses inherent risks, understands internal control structure, evaluates control risks, and determines detection risks. Auditors with successful planning can enhance judgments based on substantive audit evidences and ensure testing due to confidence and reliability of these evidences (Bedard & Johnstone, 2010). By preparing a good audit planning, auditors can achieve superior audit quality and effective audit performance. Accordingly, audit planning is a main determinant of driving and explaining audit quality and audit performance. It is likely to positively influence both audit quality and audit performance. In addition, audit planning is explicitly proposed as a mediator of the audit specialization-audit performance relationships. It plays a significant role in helping link audit specialization to audit performance. Successful audit planning leads to the efficient association between audit specialization and audit performance. Therefore,

H2a: Audit planning is positively related to audit quality.

H2b: Audit planning is positively related to audit performance.

H2c: Audit planning possibly mediates the audit specialization-audit performance relationships.

**Audit Quality**

In addition, audit quality is the second consequence of utilizing audit specialization. It explicitly results from auditors' specialization in audit works. Here, audit quality is defined as a market-assessed

joint probability that a given auditor will both discover a breach in a client's accounting system and report the breach (Knechel, 2016). It is an outcome of the auditor's practices, functions and activities by discovering errors in the client's financial statements, correcting the errors and issuing appropriate audit reports. Also, audit quality reflects auditors' independence, competence and knowledge relating to their performance. Better audit quality explicitly leads to greater audit performance. Auditors who have explicitly performed their duties' quality tend to create superior audit performance and enhance marginal benefits, contributions and advantages to users of audited financial statements. Likewise, audit quality is defined as an ability of auditors to meet investors' needs for independent and reliable audits and robust audit committee communications on financial statements, disclosures, internal control, and going concern warnings (Gaynor et al., 2016). Audit quality provides greater assurance on auditors obtaining sufficient appropriate evidences that the financial statements faithfully represent and reflect firms' underlying economics relating to their financial reporting systems and innate characteristics. As mentioned earlier, audit quality is an effective outcome of successfully implementing audit specialization while audit quality is also an efficient driver of auditors' performance. Moreover, audit quality is likely to mediate the associations between audit specialization and audit performance. Thus, it becomes a significant mediator of the audit specialization-audit performance relationships. Accordingly, audit quality is hypothesized to have a positive relationship with audit performance and mediate the audit specialization-audit performance relationships. Therefore,

H3a: Audit quality is positively related to audit performance.

H3b: Audit quality possibly mediates the audit specialization-audit performance relationships.

### ***Audit Performance***

Audit performance is the third consequence of using audit specialization and it is an outcome of auditors to perform and complete their existing duties and tasks as defined by auditing standards and other professional promulgations, laws and regulations (Boyle & Canning, 2005). Auditors who achieve a great performance tend to focus on problem solving skills and an ability to work well with clients (Buchheit, Pasewark, & Strawser, 2009). They have investigated their clients' financial statements and reports by emphasizing audit efficiency through trading off between benefits and costs in audit works and audit effectiveness through achieving audit's goals and objectives in auditors' duties and functions. Accordingly, audit performance becomes an outcome of doing effective duties, functions, practices, and activities in audit works. Thus, audit performance is considered as a key outcome of audit specialization, audit planning and audit quality.

## **Research Methods**

### ***Sample Selection Procedure and Data Collection***

In this study, certified public accountants and tax auditors are the appropriate samples of the study. In Thailand, CPAs are approved by the Federation of Accounting Professions. They must hold Bachelor's degree in accounting, have at least 3,000 hours and 3 years of auditing internship experiences and pass qualifying knowledge examinations of accounting, auditing and laws and regulations relating to accounting professions. They can audit the financial statements of all kinds of enterprises. To provide data collection by using a mail survey procedure via questionnaire, this study collects data from 1,000 CPAs in Thailand by using the simple random sampling. With regard to the questionnaire mailing, 44 surveys were undeliverable because some CPAs had moved to unknown locations. Deducting the undeliverable from the original 1,000 mailed, the valid mailing was 956 surveys, from which 251 responses were received. Of the surveys completed and returned, 243 were usable. The effective response rate was approximately 25.42% ( $243 \times 100 / 956$ ).

Similarly, TAs in Thailand are approved by the Department of Revenue, Ministry of Finance. They must hold Bachelor's degree in accounting and pass qualifying knowledge examinations of accounting, auditing, revenue codes, and civil and commercial codes relating to registered partnerships. They can audit the financial statements of only registered partnerships which contain firm capital, total assets and total revenues as not more than 5, 30 and 30 million baht respectively. The mail surveys via questionnaire are also sent to 1,000 TAs in Thailand by using the simple random sampling. With regard to the questionnaire mailing, 18 surveys were undeliverable because some TAs had moved to unknown locations. Deducting the undeliverable from the original 1,000 mailed, the valid mailing was 982 surveys, from which 221 responses were received. Of the surveys completed and returned, 217 were usable. The effective response rate was approximately 22.10% ( $217 \times 100 / 982$ ). If the response rate for a mail survey, with an appropriate follow-up procedure, are greater than 20% are considered acceptable according to Aaker, Kumar, & Day (2001). Thus, both response rates from 243 CPAs and 217 TAs in Thailand are useful for testing the research relationships in the study.

To prove potential non-response bias and to detect possible problems with non-response errors, a comparison of the first and the second wave data as recommended by Armstrong & Overton (1977) is considered. In this regard, neither procedure showed significant differences because there were no statistically significant differences between first and second groups at a 95% confidence level as auditor's age ( $t = 0.15, p > .05$ ), a number of years in audit professions ( $t = 0.11, p > .05$ ) and educational level ( $t = 0.13, p > .05$ ) in the certified public accountants and as auditor's age ( $t = 0.14,$

$p > .05$ ), a number of years in audit professions ( $t = 0.12$ ,  $p > .05$ ) and educational level ( $t = 0.17$ ,  $p > .05$ ) in the tax auditors.

### **Measures**

All constructs were measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), except for auditor's age, a number of years in audit professions and educational level. Measurements of these constructs are self-developed from existing literature through considering and interpreting the definitions of the variables and using the key concepts of these variables as shown in Appendix A.

Here, measurements of audit specialization, audit planning, audit quality, and audit performance are empirically developed. Firstly, *audit specialization* refers to an ability of auditors to possess, occupy and own a comprehensive understanding of a firm's characteristics, qualifications and statuses which enhance their abilities, competencies, capabilities, and methods for error detection of unexpected financial statement balance fluctuations and misstatements (Fleming, Hee, & Romanus, 2014). Five-item scale was developed to assess how auditors implement their specialized abilities, competencies, capabilities, and methods to detect errors of unexpected financial statement balance fluctuations and misstatements.

Secondly, *audit planning* is defined as an ability of auditors to make adequate program plan decisions and adequate audit resource allocation decisions under different conditions of risks (Hellman, 2011). Five-item scale was established to measure how auditors set an audit program with audit procedures, materiality allocation, risk assessments, and required time budgets.

Thirdly, *audit quality* is a market-assessed joint probability that a given auditor will discover a breach in a client's accounting system and report the breach (Knechel, 2016). Five-item scale was initiated to evaluate how auditors successfully provide practices, functions and activities by discovering errors in the client's financial statements, correcting the errors and issuing appropriate audit reports.

Lastly, *audit performance* is defined as an outcome of auditors to perform and complete their existing duties and tasks as defined by auditing standards and other professional promulgations, laws and regulations (Boyle & Canning, 2005). Five-item scale was utilized to gauge how auditors have gained an outcome of investigating their clients' financial statements and reports and meeting audit's goals and objectives according to their duties and functions.

### **Test of Research Instrument**

Here, confirmatory factor analysis, discriminant power and scale reliability are utilized to verify the validity and reliability of the study. Firstly, confirmatory factor analysis was implemented to assess the underlying relationships of a large number of items and to determine whether they can be reduced to a smaller set of factors. Thus, all factor loadings as values of 0.67–0.93, 0.69–0.91 and 0.68–0.91 for CPAs, TAs and pooled samples respectively are greater than the 0.40 cut-off and are statistically significant (Nunnally & Bernstein, 1994). Secondly, discriminant power was utilized to gauge the validity of the measurements by item-total correlation. In the scale validity, item-total correlations as values of 0.68–0.91, 0.70–0.91 and 0.69–0.90 for CPAs, TAs and pooled samples respectively are greater than 0.30 (Churchill, 1979). Lastly, the reliability of the measurements was evaluated by Cronbach alpha coefficients. In the scale reliability, Cronbach alpha coefficients as values of 0.88–0.95, 0.84–0.93 and 0.87–0.94 for CPAs, TAs and pooled samples respectively are greater than 0.70 (Nunnally & Bernstein, 1994). The scales of all measures express an accepted validity and reliability in this study. Tables 1–3 present the results of the validity and reliability in the study for CPAs, TAs and pooled samples separately.

**Table 1** Results of Measure Validation for CPA Sample

Items	Factor Loadings	Item-total correlation	Cronbach alpha
Audit performance (AP)	0.80–0.91	0.80–0.91	0.95
Audit specialization (AS)	0.83–0.93	0.82–0.91	0.91
Audit planning (AL)	0.67–0.89	0.68–0.88	0.88
Audit quality (AQ)	0.83–0.91	0.80–0.91	0.89

**Table 2** Results of Measure Validation for TA Sample

Items	Factor Loadings	Item-total correlation	Cronbach alpha
Audit performance (AP)	0.74–0.89	0.74–0.89	0.93
Audit specialization (AS)	0.72–0.91	0.73–0.91	0.89
Audit planning (AL)	0.69–0.86	0.70–0.87	0.85
Audit quality (AQ)	0.80–0.87	0.81–0.85	0.84

**Table 3** Results of Measure Validation for Pooled Sample

Items	Factor Loadings	Item-total correlation	Cronbach alpha
Audit performance (AP)	0.81–0.89	0.81–0.89	0.94
Audit specialization (AS)	0.77–0.91	0.78–0.90	0.90
Audit planning (AL)	0.68–0.87	0.69–0.86	0.87
Audit quality (AQ)	0.84–0.87	0.82–0.88	0.87

### **Statistical Technique**

To investigate the associations among audit specialization, audit planning, audit quality, and audit performance, this study applies structural equation model (SEM) as an appropriate approach to test these research relationships. It fits the composite approach previously discussed and is the safest option when estimating data from an unknown population (Sarstedt et al., 2016). SEM allows to make use of several indicator variables per construct simultaneously, which leads to more valid conclusions on the construct level. Thus, using other methods of analysis would often result in less clear conclusions, and/or would require several separate analyses. In this study, the direct and mediating effects of the relationships are examined.

### **Results and Discussion**

Tables 4–6 show the descriptive statistics and correlation matrix for all variables. Multicollinearity might occur when inter-correlation in each predict variable is more than 0.80, which is a high relationship (Hair et al., 2010). The correlations ranging from 0.56 to 0.88, 0.72 to 0.87 and 0.65 to 0.88 for CPAs, TAs and pooled samples respectively at the  $p < 0.05$  level. Accordingly, multicollinearity may possibly occur in this study. Thus, this study also tested variance inflation factor (VIF). The results show that VIF is less than 10. Multicollinearity is not a serious problem if the VIF is less than 10 on the scales (Hair et al., 2010). Hence, the conceptual model could be tested.

**Table 4** Descriptive Statistics and Correlation Matrix for CPA Sample

Variables	AP	AS	AL	AQ
Mean	4.21	4.20	4.34	4.27
Standard deviation	0.57	0.56	0.47	0.58
Audit performance (AP)				
Audit specialization (AS)	0.78***			
Audit planning (AL)	0.71***	0.56***		
Audit quality (AQ)	0.88***	0.77***	0.73***	

\*\*\*  $p < .01$  (two-tailed test)**Table 5** Descriptive Statistics and Correlation Matrix for TA Sample

Variables	AP	AS	AL	AQ
Mean	4.26	4.10	4.30	4.26
Standard deviation	0.47	0.53	0.43	0.45
Audit performance (AP)				
Audit specialization (AS)	0.82***			
Audit planning (AL)	0.72***	0.74***		
Audit quality (AQ)	0.87***	0.77***	0.76***	

\*\*\*  $p < .01$  (two-tailed test)**Table 6** Descriptive Statistics and Correlation Matrix for Pooled Sample

Variables	AP	AS	AL	AQ
Mean	4.24	4.15	4.32	4.27
Standard deviation	0.52	0.55	0.45	0.52
Audit performance (AP)				
Audit specialization (AS)	0.79***			
Audit planning (AL)	0.71***	0.65***		
Audit quality (AQ)	0.88***	0.76***	0.74***	

\*\*\*  $p < .01$  (two-tailed test)

Tables 7–9 present the results of path coefficients and hypotheses testing and Table 10 shows a summary of coefficients and hypotheses testing results. In this study, the goodness of fit of the models, including the goodness of fit index (GFI), the comparative fit index (CFI), the incremental fit index (IFI), and the root mean square error of approximation (RMSEA) are considered. Here, the initial test of the measurement model resulted in a good fit to the data for CPAs, TAs and pooled samples respectively. CFI values as 0.92, 0.92 and 0.91 lie between 0 and 1, with values over 0.90 indicating a relatively good fit (Bentler, 1990). GFI value as 0.93, 0.94 and 0.93 is an index that ranges from 0 to 1, with value over 0.90 indicating a relatively good fit (Byrne, 1998). IFI values exceeding 0.90 as 0.91, 0.93 and 0.94 indicate a relatively good fit (Kline, 1998). A RMSEA value of less than 0.05 as 0.03, 0.04 and 0.02 indicates a close fit and less than 0.08 suggests a marginal fit (Bollen & Long, 1993).

**Table 7** Results of Path Coefficients and Hypotheses Testing for CPA Sample

Hypotheses	Relationships	Coefficients	Standard Error	t-value
H1a	AS → AL	0.39***	0.10	3.87
H1b	AS → AQ	0.72***	0.14	5.15
H1c	AS → AP	0.01	0.17	0.02
H2a	AL → AQ	1.03***	0.28	8.75
H2b	AL → AP	0.18	0.27	0.67
H2c	AS → AL	0.39***	0.10	3.87
	AL → AP	0.18	0.27	0.64
H3a	AQ → AP	0.89***	0.22	6.03
H3b	AS → AQ	0.72***	0.14	5.15
	AQ → AP	0.89***	0.22	6.03

\*\*\*  $p < .01$  (two-tailed test)

In this study, the results show that audit specialization plays a significant role in determining and driving both audit planning and audit quality. It is positively related to audit planning ( $b = 0.39$ ,  $p < 0.01$ ;  $b = 0.66$ ,  $p < 0.01$ ;  $b = 0.51$ ,  $p < 0.01$ ) and audit quality ( $b = 0.72$ ,  $p < 0.01$ ;  $b = 0.48$ ,  $p < 0.03$ ;  $b = 0.64$ ,  $p < 0.01$ ) for CPAs, TAs and pooled samples respectively. In existing literature, auditors with specialization can possess, occupy and own their skills and knowledge, namely complete, accurate and extensive knowledge relating to plausible explanation of their clients' business environments and

industries (Jaggi, Gul, & Lau, 2012). They can detect anomalies, verify consistencies of financial statements and reports, detect and curb earnings management, minimize unintentional errors, generate more industry-unique financial statement error hypotheses, and enhance audit outcomes. Also, specialized auditors can effectively utilize their existing specialization in order to set and modify the nature of the planned audit procedures and time budgets and judge the audit procedure changes and the final audit programs and time requirements and budgets (Low, 2004). Likewise, auditors can discover and report an error or omission that could materially affect the financial statements and comply with professional standards and other related issues in the conduct of a financial statement audit (Elder, Lowensohn, & Reck, 2015). They have increased and improved the quality of audit works in long-term and future practices. Accordingly, specialized auditors can provide best audit planning and enhance their audit works' quality. *Therefore, Hypotheses 1a–1b are supported.*

Surprisingly, audit specialization has no effects on audit performance ( $b = 0.01, p < 0.99$ ;  $b = 0.32, p < 0.14$ ;  $b = 0.09, p < 0.52$ ). It does not directly lead to audit performance. Therefore, Hypothesis 1c is not supported. According to the research results, audit specialization is significantly related to audit planning and audit quality while audit planning has an important influence on audit quality, but it has no impact on audit performance. For TA sample, audit planning has a positive effect on audit performance ( $b = 0.36, p < 0.14$ ). In addition, audit quality critically affects audit performance. Thus, audit specialization has an indirect impact on audit performance. Audit quality is also the mediator of the audit specialization-audit performance relationships for both CPA and pooled samples. Similarly, audit planning and audit quality become the significant mediators of the audit specialization-audit performance relationships for TA sample. Audit planning plays a significant mediating role in driving the research relationship for only TA samples because it can help TAs effectively set audit procedures and other issues while CPAs may utilize the procedures and methods in planned audit and from other sources in audit works. Generally, both audit planning and audit quality can result from the implementation of auditors' specialization and they can continuously increase and improve their superior performance and sustainable success in audit works. *Therefore, Hypothesis 2c is partially supported while Hypothesis 3b is fully supported.*

**Table 8** Results of Path Coefficients and Hypotheses Testing for TA Sample

Hypotheses	Relationships	Coefficients	Standard Error	t-value
H1a	AS → AL	0.66***	0.17	3.95
H1b	AS → AQ	0.48**	0.22	2.17
H1c	AS → AP	0.32	0.22	1.49
H2a	AL → AQ	0.78***	0.30	4.55
H2b	AL → AP	0.36*	0.37	1.79
H2c	AS → AL	0.66***	0.17	3.95
	AL → AP	0.36*	0.37	1.79
H3a	AQ → AP	1.12***	0.34	4.26
H3b	AS → AQ	0.48**	0.22	2.17
	AQ → AP	1.12***	0.34	4.26

\*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$  (two-tailed test)

For the relationships among audit planning, audit quality and audit performance, the results indicate that audit planning has a significant effect on audit quality ( $b = 1.03$ ,  $p < 0.01$ ;  $b = 0.78$ ,  $p < 0.01$ ;  $b = 0.85$ ,  $p < 0.01$ ) for CPA, TA and pooled samples respectively. Audit planning also importantly leads to audit performance ( $b = 0.36$ ,  $p < 0.08$ ) for TA sample, except for CPA sample ( $b = 0.18$ ,  $p < 0.51$ ) and pooled sample ( $b = 0.32$ ,  $p < 0.12$ ). In audit works, auditors need to make adequate program plan decisions and adequate audit resource allocation decisions under different conditions of risks by setting a scope of audit procedures to be performed in order to obtain sufficient evidences on a fairness of reported accounting balances, namely materiality and risk (Hellman, 2011). They make planned audit procedures, define sample sizes of planned procedures, provide engagement hours for each planned procedure, and assigned auditor-rank level. Successful audit planning can help auditors develop their expectations about the likelihood of error in the financial statements and design an audit strategy that is appropriate for the circumstances (Fortvingler & Szivos, 2016). It explicitly enhances auditors' achieving the quality of audit practices, functions and duties. Better audit planning has a significant relationship with more audit quality and greater audit performance. Surprisingly, audit planning has no effects on audit performance ( $b = 0.18$ ,  $p < 0.51$ ). With the results, CPAs may utilize the procedures and methods from their owned experiences and other sources in audit works better than audit planning because they seem to have greater experiences of audit knowledge than TAs. Thus, audit planning is

significant for TAs, but is not for CPAs. This means that TAs may give the importance of audit planning more than CPAs. Therefore, Hypothesis 2a is fully supported while Hypothesis 2b is partially supported.

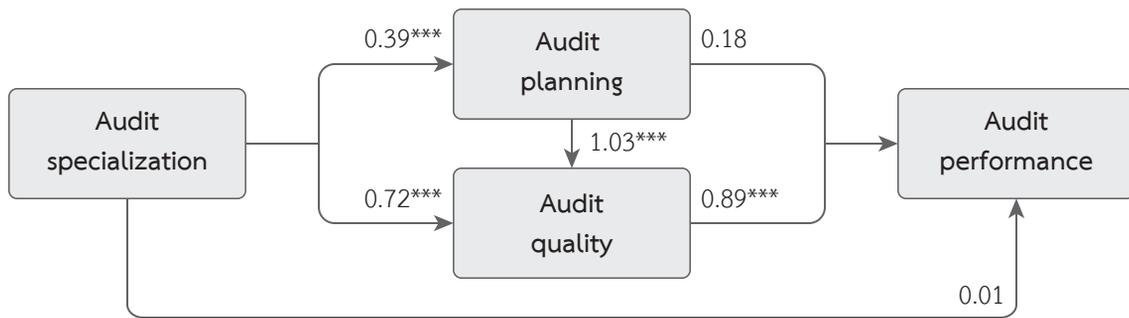
**Table 9** Results of Path Coefficients and Hypotheses Testing for Pooled Sample

Hypotheses	Relationships	Coefficients	Standard Error	t-value
H1a	AS → AL	0.51***	0.09	5.73
H1b	AS → AQ	0.64***	0.12	5.83
H1c	AS → AP	0.09	0.14	0.65
H2a	AL → AQ	0.85***	0.19	6.45
H2b	AL → AP	0.32	0.20	1.58
H2c	AS → AL	0.51***	0.09	5.73
	AL → AP	0.32	0.20	1.58
H3a	AQ → AP	0.94***	0.19	7.09
H3b	AS → AQ	0.64***	0.12	5.83
	AQ → AP	0.94***	0.19	7.09

\*\*\*  $p < .01$  (two-tailed test)

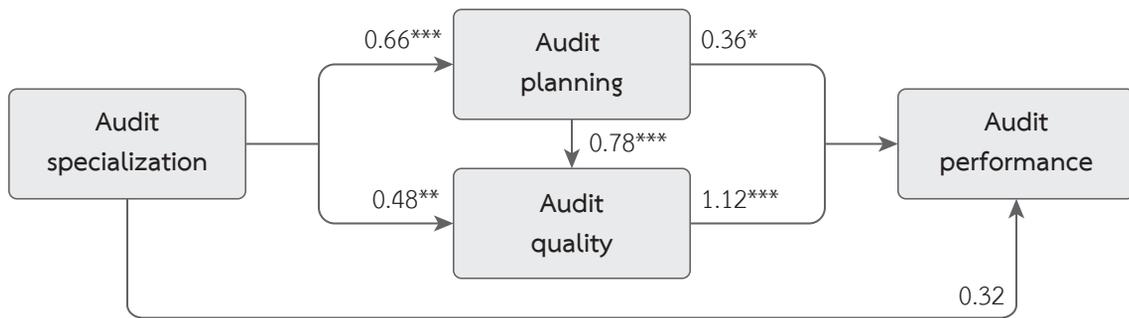
Lastly, the effects of audit quality on audit performance are empirically investigated. Audit quality has a significant positive influence on audit performance ( $b = 0.89$ ,  $p < 0.01$ ;  $b = 1.12$ ,  $p < 0.01$ ;  $b = 0.94$ ,  $p < 0.01$ ) for CPA, TA and pooled samples respectively. In existing literature, audit quality reflects auditors' abilities, competencies and capabilities in both discovering a breach in a client's accounting system and reporting the breach (Knechel, 2016). Auditors can discover errors in the client's financial statements, correct the errors and issue appropriate audit reports. They can increase superior audit performance and enhance marginal benefits, contributions and advantages to users of audited financial statements. Likewise, auditors with high quality can provide greater assurance by obtaining sufficient appropriate evidences that the financial statements faithfully represent and reflect firms' underlying economics relating to their financial reporting systems and innate characteristics (Gaynor et al., 2016). Thus, audit quality has a positive effect on audit performance. It has a potential influence on auditors' performance and success. Also, audit quality significantly plays a mediating role in determining the audit specialization-audit performance relationships. *Therefore, Hypothesis 3a is supported*

In summary, audit specialization is a main determinant of audit planning and audit quality. Audit planning definitely leads to audit quality while partially relates to audit performance. It is a significant mediator of the audit specialization-audit performance relationship. For testing the audit quality-audit performance relationships, audit quality is positively related to audit performance. Also, audit quality mediates the audit specialization-audit performance relationships explicitly and significantly. A summary of the research results is presented in Figures 2–4 and Table 10.



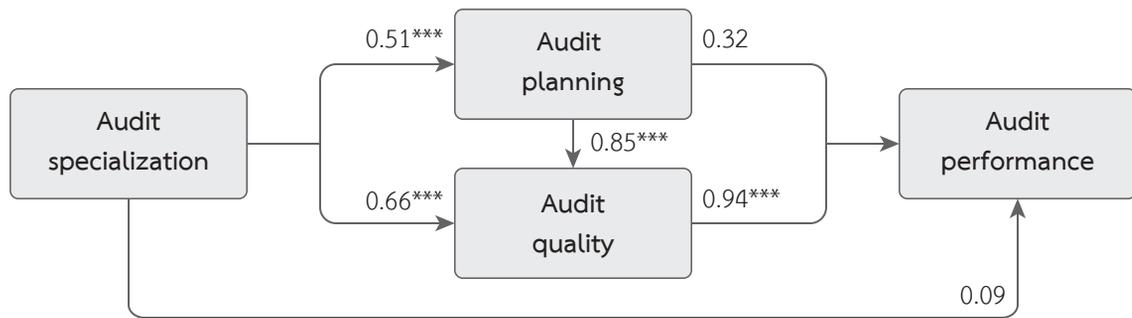
\*\*\* $p < .01$ ; CFI = 0.92; GFI = 0.93; IFI = 0.91; RMSEA = 0.03

**Figure 2:** A Summary of the Audit Specialization-Audit Performance Relationships for CPA Sample



\*\* $p < .05$ ; \*\*\* $p < .01$ ; CFI = 0.92; GFI = 0.94; IFI = 0.93; RMSEA = 0.04

**Figure 3:** A Summary of the Audit Specialization-Audit Performance Relationships for TA Sample



\*\*\*p < .01; CFI = 0.91; GFI = 0.93; IFI = 0.94; RMSEA = 0.02

**Figure 4:** A Summary of the Audit Specialization-Audit Performance Relationships for Pooled Sample

**Contributions and Directions for Future Research**

***Theoretical contribution, limitations and directions for future research***

This study attempts to integrate the concepts of audit specialization, audit planning, audit quality, and audit performance in the same conceptual model and it investigates the relationships of these concepts. This study also verifies and confirms pragmatic learning theory which audit specialization reflects to auditors’ knowledge and skills through learning from and participating in audit professions and other related issues. This study confirms that audit specialization is a key determinant of audit planning and audit quality. A great audit specialization has a positive effect on best audit planning and superior audit quality. However, there are still some rooms for future research. Firstly, future research may need to review existing literature relating to the audit specialization-audit performance relationships because this study has shown that there is no direct effect of audit specialization on audit performance. Thus, future research needs to empirically examine these relationships in order to confirm an understanding of the research results and better utilize the benefits of the relationships. Secondly, future research may need to check the mediating roles of audit planning in the audit specialization-audit performance relationships because in this study, audit planning is not a mediator of the relationships. Future research needs to effectively review the characteristics and significance of audit planning and test the aforementioned relationships in order to implement the research results to best audit practices. Thirdly, even though the response rates of this study are acceptably considered, future research may attempt to increase more response rates in the study through searching and applying a way of following up and expanding a time of collecting data. Fourthly, to expand the

current study, future research may collect data from other audit professions, namely governmental auditors (GAs) and cooperative auditors (CAs). A comparative study of the research relationships by using data from CPAs, TAs, GAs, and CAs may be necessary for testing the generalizability of the study. Lastly, this study applies structural equation model (SEM) as an effective statistical technique to test the research relationships. To verify the research results, regression model, partial least squared and path analysis should be utilized in the future research in order to expand the research outcomes, benefits and contributions.

### **Professional Contribution**

This study explicitly contributes to audit professions, including CPAs, TAs, GAs, and CAs. These contributions cover auditors' practices, activities, functions, and responsibilities. Here, audit specialization is the ability of auditors to provide their best audit practices through utilizing their knowledge and skills from learning from audit professions and other related issues and participating in communities of professional practices, societies and situated meanings. Better audit specialization is positively related to auditors' superior outcomes. Thus, auditors need to pay attention in studying, understanding, creating, improving, developing, and implementing the audit specialization to their functions, activities and responsibilities. Auditors can gain these knowledge and skills from formal education, existing literature and continuous professional training. Also, they can receive the in-depth and effective knowledge and skills from professional practices and activities, professional teams and societies and audit situated environments. Likewise, auditors need to focus on managing their knowledge and skills through effective knowledge management system in order to provide audit competency, capability, expertise, and specialization. Accordingly, auditors with better specialization can achieve superior performance and sustainable success in the long-term.

**Table 10** A Summary of Hypotheses Testing Results

Hypotheses	Relationships	CPA Sample	TA sample	Pooled Sample
H1a	Audit specialization is positively related to audit planning.	Supported	Supported	Supported
H1b	Audit specialization is positively related to audit quality.	Supported	Supported	Supported
H1c	Audit specialization is positively related to audit performance.	Not supported	Not supported	Not supported

**Table 10** A Summary of Hypotheses Testing Results (Cont.)

Hypotheses	Relationships	CPA Sample	TA sample	Pooled Sample
H2a	Audit planning is positively related to audit quality.	Supported	Supported	Supported
H2b	Audit planning is positively related to audit performance.	Not supported	Supported	Not supported
H2c	Audit planning mediates the audit specialization-audit performance relationships.	Not supported	Supported	Not supported
H3a	Audit quality is positively related to audit performance	Supported	Supported	Supported
H3b	Audit quality mediates the audit specialization-audit performance relationships.	Supported	Supported	Supported

### ***Institutional Contribution***

The Federation of Accounting Professions, the Department of Revenue, Ministry of Finance, the State Audit Office of the Kingdom of Thailand, and Cooperative Auditing Department, Ministry of Agriculture and Cooperatives in Thailand must give an attention to the importance, necessities and benefits of audit specialization for CPAs, TAs, GAs, and CAs. They can create and build reliable, creditable and acceptable auditing professions for stakeholders via the specializations of auditors. Thus, they need to promote and support both auditing professions, namely CPA and TA in order to develop audit specialization by requiring these professions to continuously join and participate in professional training. More continuous professional training is positively related to greater audit specialization. Successful professional training can enable auditors to provide audit specialization, gain best audit performance and survive and sustain in audit jobs.

## Conclusion

Audit specialization is a key determinant of increased professional outcome in auditing profession. Thus, this study aims at examining the impacts of audit specialization on audit performance of CPAs TAs in Thailand through mediating effects of audit planning and audit quality. Audit specialization, audit planning, audit quality, and audit performance are the variables of the study. In this study, both 243 CPAs and 217 TAs in Thailand are the samples of the study. Structural equation model (SEM) is appropriately utilized to examine to test the research relationships. The results show that audit specialization is significantly related to audit planning and audit quality. Also, audit planning importantly affects audit quality. Likewise, audit quality critically leads to audit performance. For testing the mediating effects, audit planning is a significant mediator of the audit specialization-audit performance relationship. To investigate the audit quality-audit performance relationships, audit quality is positively related to audit performance. It also mediates the audit specialization-audit performance relationships explicitly and significantly. Accordingly, audit specialization is important for auditing professions. Then, auditors with greater specialization can achieve outcome, success, survival, and sustainability in auditing profession. In addition, the Federation of Accounting Professions, the Department of Revenue, Ministry of Finance, the State Audit Office of the Kingdom of Thailand, and Cooperative Auditing Department, Ministry of Agriculture and Cooperatives in Thailand need to promote audit specialization by requiring these professions to continuously join and participate in professional training. To expand the current study, future research may need to review and re-examine the audit specialization-audit performance relationships and check the mediating roles of audit planning in the research relationships. Increasing more response rates in the study, future research needs to search and apply a way of following up and expand a time of collecting data. Lastly, future research needs to collect data from GAs and CAs and utilize regression model, partial least squared and path analysis in order to increase the outcomes, benefits and contributions of the study and verify the generalizability of the study respectively.

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## Appendix A Measurement of All Variables

Items
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### *Audit specialization*

- AS1: Auditors can possess a comprehensive understanding of firms' statuses which enhance their competencies and methods for error detection of unexpected financial statement balance fluctuations and misstatements.
- AS2: Auditors explicitly implement their skills and knowledge to determine plausible explanation of their clients' business environments and industries.
- AS3: Auditors significantly utilize their specialized knowledge to detect and curb earnings management and minimize unintentional errors of the clients' financial statements.
- AS4: Auditors potentially generate more industry-unique financial statement error hypotheses through an implementation of valuable skills.
- AS5: Auditors can add value to clients, offer specialized services and receive higher fees due to differentiation premiums by using their specialization.
- 

### *Audit planning*

- AL1: Auditors can make adequate program plan decisions and adequate audit resource allocation decisions under different conditions of risks.
- AL2: Auditors can set a scope of audit procedures to be performed in order to obtain sufficient evidences on a fairness of reported accounting balances.
- AL3: Auditors can effectively provide planned audit procedures, define sample sizes of planned procedures, set budgeted engagement hours for each planned procedure, and assign auditor-rank level.
- AL4: Auditors can make their expectations about the likelihood of error in the financial statements and design an audit strategy that is appropriate for the circumstances.
- AL5: Auditors can obtain client background information, set materiality level, perform preliminary analytical review, assess inherent risks, understand internal control structure, evaluate control risks, and determine detection risks in a planning process.
-

**Items**

*Audit quality*

- AQ1: Auditors can comply with auditing and professional standards and other related regulations and rules for reporting and fieldworks.
- AQ2: Auditors can provide an adequate achievement of an audit procedure conducted to bring to the sufficient amount of evidences gathered during the audit practices.
- AQ3: Auditors can take deliberate and intentional actions to expand an availability of evidences collected with concrete reasons.
- AQ4: Auditors focus on independent, reliable and robust audits on financial statements, disclosures, internal control and going concern warnings.
- AQ5: Auditors can obtain sufficient appropriate evidences that the financial statements faithfully represent and reflect firms' underlying economics, conditioned on their financial reporting systems and innate characteristics.
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*Audit performance*

- AP1: Auditors efficiently perform and complete their existing duties and tasks.
- AP2: Auditors successfully implements problem solving skills and an ability to work well with clients.
- AP3: Auditors efficiently investigate their clients' financial statements and reports by emphasizing trading off between benefits and costs in audit works.
- AP4: Auditors can meet the audit's goals and objectives in auditors' practices, activities, duties, and functions.
- AP5: Auditors' performances have been continuously accepted from users and stakeholders.
- 

