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Decision-Making and Judgment Behavior of Supreme Audit Court Auditors Based on Cognitive and Metacognitive Components

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Abstract

The purpose of this study was to examine the role of cognitive and metacognitive components in the decision-making and judgment behavior of auditors of the Supreme Audit Court. The research was designed using a mixed-methods approach incorporating both quantitative and qualitative components. The quantitative component included 250 auditors and employed standardized questionnaires to measure cognitive components (knowledge, experience, and cognitive biases), metacognitive components (mental process control, professional skepticism, and decision review), and decision-making and judgment behavior. The data were analyzed using structural equation modeling. The qualitative component was conducted through semi-structured interviews and thematic analysis, resulting in the extraction of six main categories and 21 subcategories to examine auditors' decision-making and judgment behavior within their experiential and professional contexts. The findings indicate that metacognitive and cognitive skills significantly influence auditors' decision-making and judgment behavior. Mental process control, professional skepticism, decision review, professional knowledge, and professional experience contribute to improving the accuracy and quality of decisions, whereas cognitive biases may adversely affect judgment. The qualitative findings, consistent with the quantitative results, also confirm the importance of managing mental processes and enhancing professional and experiential competencies in improving decision-making. Based on these findings, strengthening cognitive and metacognitive skills, reviewing decisions, providing continuous training, and reducing the influence of biases through decision-support tools and a supportive organizational culture are proposed as practical strategies for increasing accuracy and confidence in auditing processes.

Keywords: decision-making behavior, judgment, auditors, cognition, metacognition, Supreme Audit Court.

1. Introduction

Professional judgment and decision-making constitute the core of audit practice because auditors are continually required to interpret incomplete evidence, assess competing explanations, evaluate risk, determine the sufficiency and appropriateness of audit evidence, and select among alternative courses of action under conditions of uncertainty. These processes are especially consequential in public-sector auditing, where audit conclusions may influence the allocation of public resources, the assessment of administrative accountability, the prevention and detection of fraud, and the legitimacy of governmental



oversight. Contemporary audit research increasingly recognizes that judgment quality cannot be explained solely by technical standards or procedural compliance; rather, it emerges from the interaction of auditors' knowledge, experience, cognitive styles, metacognitive regulation, personality, ethical orientation, institutional pressures, and technological environments. Recent studies have accordingly shifted attention from purely technical models of audit quality toward behavioral and cognitive explanations of how auditors process information and reach professional conclusions (Afraini et al., 2025; Nugrahanti et al., 2025; Van, 2025). This perspective is particularly relevant for auditors working in supreme audit institutions, where the scope and complexity of assignments often require the simultaneous consideration of legal, financial, operational, and public-interest dimensions. Evidence from studies conducted in governmental audit settings indicates that competence, independence, professionalism, organizational pressures, and behavioral characteristics significantly shape auditors' ability to detect fraud and form reliable judgments (Ringo, 2025; Usman et al., 2025; Yanto et al., 2025). Likewise, dysfunctional behavior in audit organizations has been associated with personality characteristics and ethical culture, underscoring the fact that professional outcomes depend not only on formal rules but also on internal psychological processes and the surrounding organizational environment (Wardhani et al., 2025). In this context, examining cognition and metacognition offers a theoretically coherent framework for understanding why auditors facing similar evidence may nevertheless reach different judgments, display different levels of professional skepticism, or differ in the extent to which they revise an initial conclusion.

Cognition refers broadly to the mental processes involved in acquiring, interpreting, storing, retrieving, and using information for reasoning and action. In auditing, cognitive resources encompass professional knowledge, accumulated experience, analytical capability, memory, inferential reasoning, and the heuristics used to simplify complex decisions. Professional knowledge provides auditors with structured schemas for interpreting evidence, whereas experience helps them recognize recurring patterns, distinguish relevant from irrelevant cues, and make faster decisions in familiar settings. Studies of auditor behavior consistently emphasize the role of knowledge, skills, competence, and professional characteristics in determining judgment performance (Handoyo & Andika, 2025; Ramadani et al., 2025; Van, 2025). Research has also shown that broader cognitive capacities, including multiple intelligences, can influence judgment and decision-making performance, suggesting that audit reasoning is multidimensional rather than reducible to a single technical competency (Ahmadi & Pourzamani, 2025). At the same time, experiential knowledge does not automatically guarantee superior decisions. Intuitive decision-making may become increasingly efficient as expertise develops, but intuition is itself shaped by prior learning, pattern recognition, and contextual familiarity; therefore, it can either improve or distort judgment depending on the quality of experience and the structure of the task (Kaviani et al., 2025). Contemporary work on financial decision-making similarly highlights the importance of cognitive attributes in shaping risk perception, information processing, and choice behavior (Mallika & O, 2025). These findings imply that professional judgment should be understood as a cognitive achievement resulting from the interaction between formal knowledge, practical experience, and task-specific reasoning rather than as a simple consequence of adherence to auditing standards.

One of the most important limitations of human cognition in audit settings is susceptibility to cognitive bias. Auditors routinely make decisions under time pressure, ambiguity, incomplete information, and competing incentives, all of which increase reliance on heuristics and automatic processing. Such shortcuts can be useful because they reduce cognitive load, yet they may also generate systematic errors such as anchoring, confirmation bias, overconfidence, availability effects, framing effects, and premature closure. Recent systematic and conceptual reviews have placed cognitive bias at the center of the behavioral accounting and auditing literature and have emphasized that accounting judgments are vulnerable to recurring patterns of non-rational information processing (Cristofaro et al., 2025; Wahyudi et al., 2025). Prior audit information may also shape subsequent evaluations in ways that affect professional judgment, indicating that decision outcomes can be path-dependent rather than exclusively evidence-driven (Sánchez-Martín et al., 2024). Personality-related tendencies may further interact with cognitive processes. Dark personality traits, for example, have been linked with differences in auditors' judgment and planned behavior, while other research has documented relationships between personality, cognitive style, and professional skepticism (Araujo et al., 2025; Matitaputty et al., 2025). These findings reinforce the need to distinguish between productive expertise-based heuristics and maladaptive biases. They also suggest that audit judgment quality depends not only on what auditors know but on how they monitor the reasoning through which knowledge is translated into conclusions. This distinction



becomes especially important in complex public-sector settings where an apparently efficient mental shortcut may either represent expert pattern recognition or conceal insufficient analysis.

Metacognition provides the mechanism through which individuals become aware of, monitor, regulate, and revise their own cognitive processes. It includes knowledge about cognition, ongoing monitoring of reasoning, strategic control of mental operations, evaluation of confidence, recognition of uncertainty, and revision of decisions when new evidence emerges. Although metacognition has been extensively examined in educational and psychological research, its implications are increasingly relevant to professional decision environments because complex tasks require individuals to assess not only external information but also the adequacy of their own reasoning. General studies of metacognition emphasize its multidimensional nature and the need to assess both monitoring and control processes rather than treating it as a unitary trait (Kassimi & Kassimi, 2025; Schempp et al., 2025). Research on metacognitive strategies has likewise shown that self-monitoring, planning, evaluation, and resource management improve the regulation of cognitive activity (Panduranga et al., 2024; Rahmat et al., 2025). Experimental work also indicates that metacognitive monitoring is influenced by prior knowledge and cognitive style, demonstrating that confidence and self-evaluation are themselves cognitively conditioned rather than neutral processes (Ager et al., 2025). At a neurocognitive level, emerging evidence suggests that metacognitive memory judgments are supported by identifiable patterns of neural coordination, providing further support for the proposition that metacognition is a distinct regulatory layer over first-order cognition (Pan et al., 2024). In auditing, this regulatory layer is highly relevant because auditors must continually question whether their evidence base is sufficient, whether alternative interpretations have been considered, whether an initial hypothesis is unduly influencing later analysis, and whether a final decision should be revised before being formalized.

Within audit practice, professional skepticism can be conceptualized as one of the clearest behavioral manifestations of metacognitive regulation. Professional skepticism requires a questioning mind, alertness to conditions that may indicate error or fraud, and a critical assessment of evidence. It therefore involves both cognitive appraisal and self-regulatory control. Research shows that professional skepticism is affected by personality and cognitive style and that it can be weakened when auditors experience psychological resource depletion (Matitaputty et al., 2025; Shirowzhan & Fakhari, 2024). The quality of judgment and decision-making among forensic auditors has similarly been linked to the ability to maintain skepticism despite cognitive strain, highlighting the importance of managing mental resources during demanding assignments (Shirowzhan & Fakhari, 2024). Fraud detection research also underscores the importance of professional competence, skepticism, and behavioral capability in identifying misstatement and irregularities (Handoyo & Andika, 2025; Yanto et al., 2025). From a metacognitive standpoint, skepticism is not merely distrust; it is a disciplined process of monitoring certainty, identifying gaps in evidence, and deliberately resisting premature closure. Decision review is another closely related metacognitive process. When auditors revisit a preliminary conclusion, compare it against standards, challenge the adequacy of evidence, and consider alternative interpretations, they exercise metacognitive control over a previously formed judgment. This process is especially important because initial judgments can become anchors, and without deliberate review, later information may be assimilated in a confirmatory manner. Thus, mental process control, professional skepticism, and decision review can be treated as interrelated dimensions of metacognition that may collectively improve audit judgment by regulating the application of underlying cognitive resources.

Ethical and affective factors further complicate judgment because auditing decisions are not made in an emotionally or morally neutral environment. Ethical ideology, perceived moral intensity, emotional intelligence, religiosity, and professional ethics have all been associated with auditors' ethical decision-making and conduct (Al Ali et al., 2025; Oktryani et al., 2025; Rajest et al., 2024; Rasita et al., 2025). These findings are relevant to cognition and metacognition because ethical choices also require interpretation, self-monitoring, conflict resolution, and the regulation of intuitive responses. Affective neuroscience research in auditing has increasingly argued that emotional mechanisms interact with cognitive processing during judgment, challenging models that treat professional decisions as purely rational computations (Munidewi et al., 2024). Psychological determinants of professional judgment likewise include both cognitive and non-cognitive influences, suggesting that judgment quality is the product of an integrated behavioral system rather than isolated technical expertise (Afraini et al., 2025). Research on financial intelligence and personality among auditors of the Supreme Audit Court of Iran also indicates that personal



characteristics may mediate the relationship between individual capabilities and judgment outcomes, reinforcing the need for a model that accommodates layered psychological mechanisms (Mirashrafi et al., 2025). Consequently, cognition and metacognition should not be interpreted as detached from ethics or personality; rather, they provide a central processing framework through which individual characteristics, professional standards, and situational pressures are translated into concrete audit decisions.

The increasing digitalization of auditing introduces another layer of complexity to judgment behavior. Artificial intelligence, advanced analytics, and information technologies can augment auditors' capacity to process large datasets, detect anomalies, and structure decision problems, but they may also alter the cognitive architecture of professional judgment by redistributing tasks between human and machine. Recent studies have examined the role of artificial intelligence in audit judgment and have emphasized both its potential to enhance consistency and its implications for professional discretion (Abdullah, 2025). Research on auditing in the context of Industry 5.0 similarly highlights the need to understand how human judgment adapts to technology-rich environments in which decision support becomes more pervasive (Silva-Atencio & Silva-Atencio, 2025). Information technology has also been shown to moderate the relationships among auditor competence, time pressure, and audit quality, suggesting that technology can either strengthen or weaken the translation of human capability into audit performance depending on how it is integrated into professional processes (Budianto & Firmansyah, 2025). Contemporary challenges in audit practice therefore involve not only technical modernization but also the management of human cognition under conditions of automation, accelerated information flows, and increasing task complexity (Pasolo, 2024). In such settings, metacognitive skills may become even more important because auditors must evaluate when to rely on automated outputs, when to override them, how to assess their own level of understanding, and how to preserve professional skepticism when algorithmic recommendations appear authoritative.

A growing body of research has begun to directly connect cognition and metacognition with audit and tax judgment. Recent studies have applied qualitative synthesis techniques to identify components of decision-making and judgment behavior among auditors and tax inspectors and have explicitly proposed cognition and metacognition as central explanatory domains (Mehranifar & Rahimi, 2025; Mehranifar et al., 2025; Pouraghajan et al., 2025). This line of work is important because it moves beyond fragmented studies of individual traits and provides a more integrated framework in which knowledge, experience, cognitive bias, self-monitoring, professional skepticism, and decision review are understood as interdependent mechanisms. However, much of the existing literature remains either conceptual, literature-based, or focused on specific determinants in isolation. Reviews of audit judgment determinants emphasize the diversity of factors involved but also reveal the need for integrated empirical models that simultaneously examine cognitive and metacognitive dimensions (Nugrahanti et al., 2025). Similarly, the behavioral literature has developed substantial evidence regarding personality, intuition, ethics, technology, skepticism, and bias, yet fewer studies have tested how these components jointly contribute to decision-making and judgment in a single structural model. The problem is particularly salient in public-sector supreme audit institutions, where judgments are institutionally consequential and auditors work under legal mandates, public accountability requirements, organizational controls, and substantial evidential complexity.

The Supreme Audit Court provides a particularly appropriate setting for examining these relationships because its auditors operate at the intersection of accounting, law, public administration, performance evaluation, and public accountability. Their decisions often require evaluating not only whether financial information is technically accurate but also whether public expenditures are lawful, efficient, properly documented, and aligned with established regulations. Such tasks increase exposure to ambiguity and require the integration of formal knowledge with experiential judgment. At the same time, institutional pressures may shape the extent to which auditors rely on independent judgment, established procedures, or organizational cues, as demonstrated in research on government audit institutions (Usman et al., 2025). Studies conducted within audit-board environments have also shown that fraud prevention and detection depend on a combination of auditor capabilities, institutional context, and professional behavior (Agoes & Prasetyo, 2025; Yanto et al., 2025). Therefore, investigating cognition and metacognition within this context can provide both theoretical and practical insight. Theoretically, it can clarify how first-order cognitive resources and second-order regulatory processes interact in professional judgment. Practically, it can inform



recruitment, training, review procedures, decision-support design, and organizational policies aimed at strengthening audit quality.

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Despite the rapid growth of behavioral auditing research, several gaps remain. First, studies of audit judgment frequently examine single predictors such as competence, personality, ethics, professional skepticism, or technology without integrating them into a broader cognitive-regulatory model (Araujo et al., 2025; Oktryani et al., 2025; Van, 2025). Second, although cognitive biases are widely recognized, less attention has been paid to the metacognitive processes through which auditors may detect, regulate, or compensate for those biases (Cristofaro et al., 2025; Wahyudi et al., 2025). Third, professional skepticism is often treated as an independent professional trait, whereas conceptually it may function as part of a larger metacognitive control system involving monitoring, uncertainty evaluation, and decision review. Fourth, many studies have been conducted in private audit firms or general accounting contexts, leaving public-sector supreme audit institutions comparatively underexplored. Fifth, studies that rely exclusively on quantitative models may identify statistical relationships without fully explaining how auditors themselves experience and describe the reasoning processes behind their judgments. A mixed-methods design is therefore particularly suitable because quantitative modeling can estimate the magnitude of relationships among constructs, whereas qualitative inquiry can illuminate how auditors interpret cognitive demands, regulate uncertainty, and revise decisions in practice.

Accordingly, the present study adopts an integrated mixed-methods framework in which cognition is represented through professional knowledge, experience, and cognitive biases, while metacognition is represented through mental process control, professional skepticism, and decision review. This framework is consistent with current literature emphasizing the behavioral determinants of audit judgment, the regulatory role of metacognition, the risks associated with cognitive bias, and the importance of competence and experience in professional performance (Mehranifar et al., 2025; Pouraghajan et al., 2025; Ramadani et al., 2025). It also responds to calls for more context-sensitive research capable of capturing the interaction among psychological processes, institutional conditions, and emerging technological influences in modern auditing (Abdullah, 2025; Silva-Atencio & Silva-Atencio, 2025). By combining structural modeling with qualitative thematic analysis, the study seeks to generate a more comprehensive explanation of auditors' judgment than would be possible through either approach alone.

The aim of this study is to examine the effects of cognitive and metacognitive components on the decision-making and judgment behavior of auditors of the Supreme Audit Court and to explain the underlying cognitive and metacognitive processes that shape their professional judgments.

2. Methods and Materials

The present study employed a mixed-methods design comprising complementary quantitative and qualitative components. The purpose of the study was to investigate the effects of cognitive and metacognitive components on the decision-making and judgment behavior of auditors of the Supreme Audit Court and to explain their cognitive and metacognitive processes when confronted with complex decisions. In the quantitative component, the relationships between the independent variables, including cognitive biases, professional knowledge, and work experience, and the dependent variable of auditors' decision-making and judgment behavior were measured using standardized questionnaires and a five-point Likert scale. Data analysis was performed using correlation analysis, multiple regression analysis, and structural equation modeling (SEM). The target population consisted of all auditors of the Supreme Audit Court with practical experience in audit-related decision-making and professional judgment. In the quantitative phase, purposive-stratified sampling was conducted on the basis of professional experience and length of service. For the qualitative phase, purposive criterion-based sampling was used, and interviews were conducted with auditors possessing experience in complex and long-term decision-making. Interviews continued until data saturation was achieved. The quantitative data collection instruments consisted of standardized questionnaires measuring cognitive biases, professional knowledge, work experience, and metacognitive components. The metacognitive components included self-monitoring, control of professional skepticism, and self-feedback. Auditors' decision-making and judgment behavior was assessed in terms of decision accuracy, compliance with auditing standards, risk management, and professional skepticism. For the qualitative component, semi-structured interviews containing open-ended questions concerning auditors' cognitive processes, metacognitive styles, and decision-making experiences were conducted. Following recording and



transcription, the resulting data were prepared for thematic analysis. Quantitative data analysis began with preliminary tests, including assessment of data normality and confirmatory factor analysis. In the qualitative component, thematic analysis was applied to identify patterns and cognitive and metacognitive processes among auditors, and the qualitative findings were used to deepen and explain the quantitative findings. The research procedures included reviewing the literature related to cognition, metacognition, cognitive biases, professional skepticism, and auditors' decision-making; designing the questionnaire and interview guide; collecting the data; conducting quantitative and qualitative analyses; and, finally, interpreting the findings and proposing recommendations for improving auditors' decision-making and judgment processes. By integrating quantitative and qualitative data, this research design provides a comprehensive and multidimensional understanding of the role of cognitive and metacognitive components in auditors' professional decision-making.

3. Findings and Results

An examination of the respondents' demographic characteristics indicates that, of the 250 participants in the study, 72% (180 participants) were male and 28% (70 participants) were female. This distribution indicates the predominance of male personnel within the professional structure of the auditors under investigation, which is consistent with the common workforce composition in public-sector supervisory and auditing domains. In terms of age, the highest frequency was observed in the 36–40-year age group (28%), followed by the 31–35-year age group (24%). Participants aged 41–45 years constituted 20% of the sample, whereas the 25–30-year and over-45-year groups each accounted for 14%. This distribution indicates that a substantial proportion of the sample was in the stage of professional middle adulthood, a period generally associated with the consolidation of occupational experience and cognitive maturity. Such a structure may influence the quality of professional decision-making and judgment because it reflects a combination of work-related energy and accumulated experience. Regarding educational attainment, the majority of respondents held a master's degree (56%), 36% held a bachelor's degree, and only 8% held a doctoral degree. The predominance of postgraduate education in the sample reflects a high level of academic specialization among the auditors, which may provide a foundation for strengthening the “cognitive knowledge” component in the research model. With respect to work experience, the largest proportion belonged to the 6–10-year category (32%), followed by the 11–15-year category (28%). The 1–5-year and more-than-15-year groups each represented 20% of the sample. This distribution indicates that most respondents possessed moderate to extensive professional experience. Accordingly, the “professional experience” component, as one of the dimensions of cognition, can be expected to have substantial practical support in this population. In terms of organizational unit, 48% worked in financial auditing, 28% in performance auditing, and 24% in project auditing. The greater concentration in financial auditing is expected because this area usually encompasses the broadest scope of activity within supervisory institutions. Differences among organizational units may produce variation in the nature of decision-making and the extent of exposure to professional complexities. Finally, regarding job position, staff auditors constituted 52% of the sample, 32% were senior auditors or supervisors, and 16% were audit managers. This composition reflects the inclusion of different hierarchical levels within the sample and enables analysis of the potential effect of organizational position on decision-making and judgment behavior. The inclusion of more experienced managers and senior auditors may also enhance the richness of the study's qualitative and quantitative analyses.

Table 1. Demographic Characteristics of the Sample

Demographic Characteristic	Category	Frequency	Percentage
Gender	Male	180	72%
	Female	70	28%
Age (years)	25–30	35	14%
	31–35	60	24%
	36–40	70	28%
	41–45	50	20%
	Over 45	35	14%
Educational level	Bachelor's degree	90	36%
	Master's degree	140	56%
	Doctoral degree	20	8%
Work experience (years)	1–5	50	20%
	6–10	80	32%
	11–15	70	28%



	More than 15	50	20%
Organizational unit	Financial auditing	120	48%
	Performance auditing	70	28%
	Project auditing	60	24%
Job position	Staff auditor	130	52%
	Senior auditor/supervisor	80	32%
	Audit manager	40	16%

Table 2. Descriptive Findings for the Research Variables

Statistic	Metacognition	Cognition	Decision-Making and Judgment Behavior	Mental Process Control	Professional Skepticism	Decision Review	Knowledge	Experience	Biases
Mean	2.8329	2.9686	2.9714	2.9168	2.8268	0.9184	2.8207	3.0300	3.0347
Median	2.8667	2.9750	2.9500	2.9000	2.8500	0.9000	2.6667	3.0000	3.0000
Standard deviation	0.75492	0.87138	0.87171	0.85642	0.78482	0.28240	0.96604	0.94209	1.03331
Variance	0.570	0.759	0.760	0.733	0.616	0.080	0.933	0.888	1.068
Range	3.93	4.00	4.00	3.90	4.00	1.33	4.00	4.00	4.00
Minimum	1.07	1.00	1.00	1.10	1.00	0.33	1.00	1.00	1.00
Maximum	5.00	5.00	5.00	5.00	5.00	1.67	5.00	5.00	5.00

To examine the overall status of the research variables, descriptive statistical indices, including the mean, median, standard deviation, variance, range, minimum, and maximum, were calculated for each variable. The results indicate that the means of most variables were close to 3, the midpoint of the Likert scale, suggesting a relatively moderate-to-high level in the population under study. Among the principal variables, cognition, with a mean of 2.9686, and decision-making and judgment behavior, with a mean of 2.9714, were at moderate levels tending toward the upper range. The mean of metacognition was 2.8329, which was slightly lower than those of the other principal variables but remained within the moderate range. This finding indicates that auditors' metacognitive skills are at an acceptable level, although they are assessed as somewhat weaker than their cognitive components. Regarding the dimensions of metacognition, the mean values of mental process control (2.9168), professional skepticism (2.8268), and decision review suggest that mental process control was in a more favorable condition than the other metacognitive dimensions. The lower mean of professional skepticism relative to the other dimensions may indicate a relative tendency to initially accept evidence without sufficiently rigorous challenge, which requires greater attention in the auditing profession. With regard to cognitive components, the mean for knowledge (2.8207) was at a moderate level, whereas experience (3.0300) had the highest mean among the variables. This indicates that the auditors under investigation possessed relatively substantial practical experience. The mean for biases (3.0347) was also relatively high; considering the nature of this variable, a higher score may indicate a greater perceived presence or occurrence of cognitive biases, which may adversely affect the quality of professional judgment. In terms of data dispersion, the highest standard deviation was observed for biases (1.03331), followed by knowledge (0.96604) and experience (0.94209). This indicates greater variability in responses to these variables and suggests that auditors' perceptions of these dimensions were not homogeneous. In contrast, the lowest standard deviation was associated with decision review (based on the recorded value of 0.28240), indicating a high degree of convergence among responses on this dimension. The range of scores for most variables was close to 4 units, and the minimum and maximum values generally extended from 1 to 5, indicating that respondents used the full Likert scale and that the data possessed adequate discriminatory power.

Table 3. Normality Tests for the Research Variables

Variable	Kolmogorov–Smirnov Statistic	df	p	Shapiro–Wilk Statistic	df	p
Metacognition	0.093	250	< .001	0.983	250	.005
Cognition	0.151	250	< .001	0.988	250	.031
Decision-making and judgment behavior	0.146	250	< .001	0.990	250	.044
Mental process control	0.127	250	< .001	0.968	250	< .001
Professional skepticism	0.065	250	.012	0.990	250	.040
Decision review	0.096	250	< .001	0.980	250	.001
Knowledge	0.131	250	< .001	0.956	250	< .001
Experience	0.078	250	.001	0.983	250	.004
Biases	0.123	250	< .001	0.963	250	< .001



To assess the normality of the distributions of the research variables, both the Kolmogorov–Smirnov and Shapiro–Wilk tests were employed. Given that the sample size was 250, both tests could be considered informative, although the Kolmogorov–Smirnov test tends to be more sensitive to minor deviations from normality in larger samples. The results of the Kolmogorov–Smirnov test indicate that the significance level for all variables was below .05. Specifically, significance values below the .05 threshold were reported for metacognition ($p < .001$), cognition ($p < .001$), decision-making and judgment behavior ($p < .001$), mental process control ($p < .001$), professional skepticism ($p = .012$), decision review ($p < .001$), knowledge ($p < .001$), experience ($p = .001$), and biases ($p < .001$). These results indicate that the null hypothesis of normality was rejected based on the Kolmogorov–Smirnov test. The Shapiro–Wilk test results confirmed the same pattern. The significance level for all variables was below .05, including metacognition ($p = .005$), cognition ($p = .031$), decision-making and judgment behavior ($p = .044$), mental process control ($p < .001$), professional skepticism ($p = .040$), decision review ($p = .001$), knowledge ($p < .001$), experience ($p = .004$), and biases ($p < .001$). Therefore, the assumption of normally distributed data was also rejected on the basis of the Shapiro–Wilk test. Overall, the results of the normality tests indicate that all principal research variables had significance levels below .05 and therefore did not follow a normal distribution. From the perspective of professional analyses in auditing and organizational research, this finding suggests that methods appropriate for non-normal data, including nonparametric or robust statistical techniques, should be employed to test the research hypotheses in order to enhance the validity and accuracy of the results. PLS was therefore used as an appropriate nonparametric-oriented variance-based modeling approach. One of the principal reasons for using PLS is its suitability for data that do not satisfy multivariate normality assumptions, a condition frequently encountered by researchers in empirical studies.

Table 4. Assessment of Construct Reliability and Convergent Validity

Construct	Cronbach's Alpha	Dijkstra–Henseler's rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
Decision review	0.900	0.902	0.918	0.528
Experience	0.883	0.886	0.908	0.552
Professional skepticism	0.862	0.862	0.889	0.546
Knowledge	0.879	0.881	0.908	0.622
Auditors' decision-making and judgment behavior	0.947	0.948	0.952	0.502
Biases	0.895	0.896	0.920	0.657
Cognition	0.943	0.945	0.949	0.583
Metacognition	0.952	0.953	0.955	0.519
Mental process control	0.904	0.906	0.921	0.537

To evaluate the quality of the measurement model, construct reliability and convergent validity were assessed. Accordingly, Cronbach's alpha, Dijkstra–Henseler's rho_A, composite reliability (CR), and average variance extracted (AVE) were calculated. The results showed that Cronbach's alpha values for all study constructs, including decision review (0.900), experience (0.883), professional skepticism (0.862), knowledge (0.879), auditors' decision-making and judgment behavior (0.947), biases (0.895), cognition (0.943), metacognition (0.952), and mental process control (0.904), exceeded the threshold of 0.70. These values indicate desirable and acceptable internal consistency among the items measuring each construct and demonstrate that the research instrument has adequate internal stability. The highest Cronbach's alpha values were obtained for metacognition (0.952) and auditors' decision-making and judgment behavior (0.947), indicating a high degree of consistency among the indicators of these constructs. Furthermore, rho_A values for all constructs ranged from 0.862 to 0.953, exceeding the minimum acceptable criterion of 0.70 and confirming adequate construct reliability within the partial least squares structural equation modeling framework. In addition, composite reliability values for all variables ranged from 0.889 to 0.955, indicating a highly satisfactory level of construct reliability and demonstrating that the indicators of each construct consistently measure the intended concept. Convergent validity was assessed using the average variance extracted criterion. The results showed that AVE values for all constructs exceeded 0.50, including decision review (0.528), experience (0.552), professional skepticism (0.546), knowledge (0.622), auditors' decision-making and judgment behavior (0.502), biases (0.657), cognition (0.583), metacognition (0.519), and mental process control (0.537). AVE values above 0.50 indicate that each construct explains more than half of the variance in its indicators and therefore demonstrates acceptable convergent validity.



Overall, the findings obtained from the reliability and convergent validity indices indicate that the study's measurement model is of satisfactory quality and that the instrument possesses strong internal reliability and acceptable convergent validity. Accordingly, the structural model and research hypotheses can be evaluated with confidence.

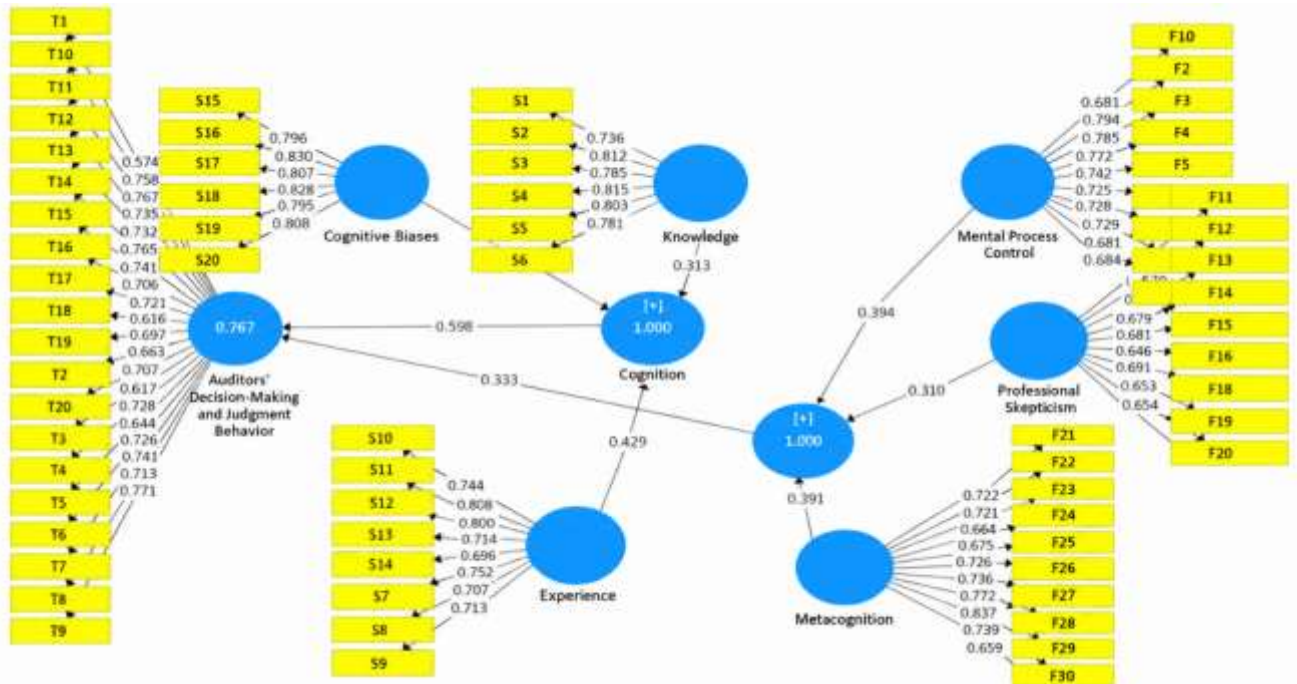


Figure 1. Path coefficients of the research variables

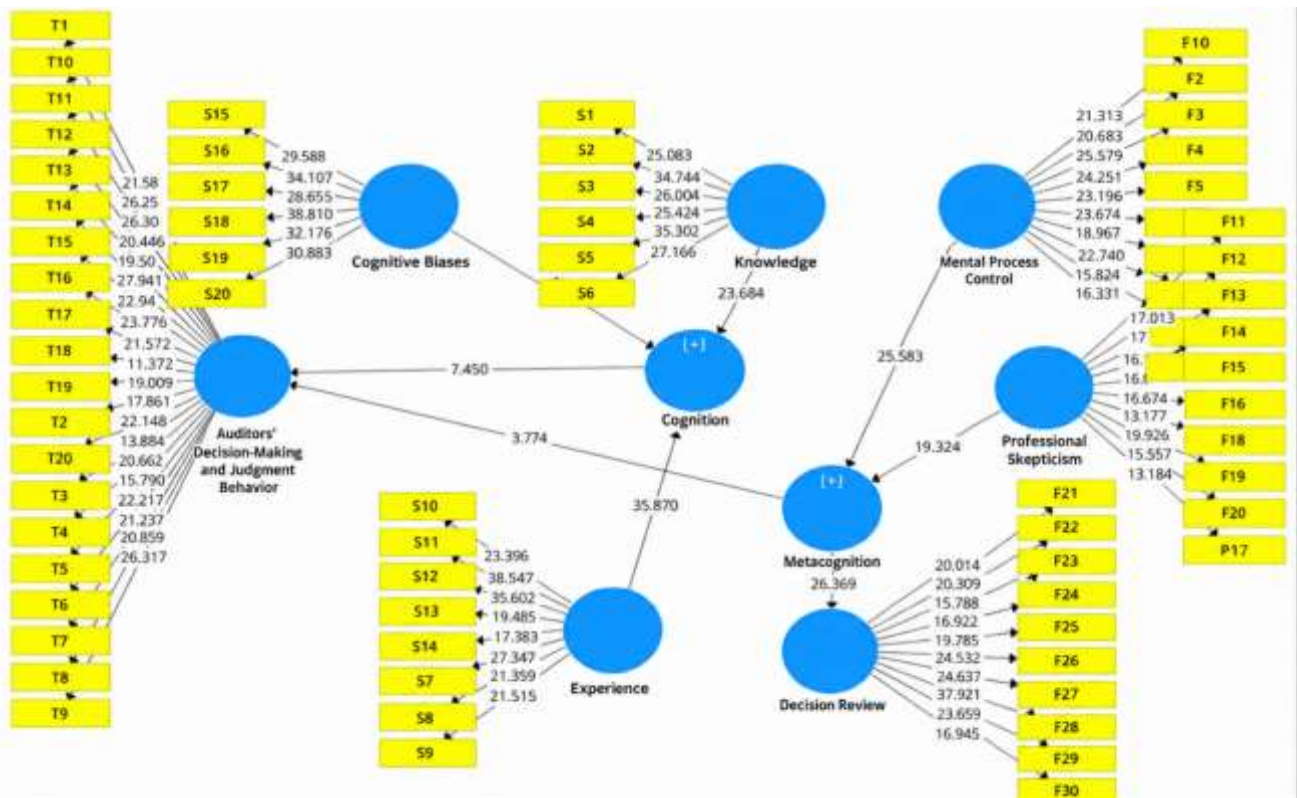


Figure 2. t values of the research variables

Table 5. Path Coefficients and Test Statistics for the Research Variables

Path	Path Coefficient	Standard Deviation	<i>t</i> Statistic	<i>p</i> Value
Metacognition → Auditors' decision-making and judgment behavior	0.333	0.088	3.774	< .001
Cognition → Auditors' decision-making and judgment behavior	0.598	0.080	7.450	< .001
Mental process control → Auditors' decision-making and judgment behavior	0.131	0.035	3.740	< .001
Professional skepticism → Auditors' decision-making and judgment behavior	0.103	0.028	3.725	< .001
Decision review → Auditors' decision-making and judgment behavior	0.130	0.035	3.736	< .001
Knowledge → Auditors' decision-making and judgment behavior	0.187	0.027	7.025	< .001
Experience → Auditors' decision-making and judgment behavior	0.257	0.035	7.270	< .001
Biases → Auditors' decision-making and judgment behavior	0.223	0.030	7.315	< .001

To test the research hypotheses, partial least squares structural equation modeling (PLS-SEM) was employed, and the significance of the path coefficients was assessed using *t* statistics and *p* values. The decision criteria adopted in this study were a *t* statistic greater than 1.96 and a significance level below .05.

The results indicated that metacognition had a positive and significant effect on auditors' decision-making and judgment behavior. Therefore, the first main hypothesis was supported. This finding indicates that higher levels of awareness and monitoring of one's own cognitive processes among auditors are associated with improved decision-making and judgment quality.

Cognition, with a path coefficient of 0.598, also demonstrated the strongest effect on auditors' decision-making and judgment behavior. Because the *t* statistic was substantially higher than the critical value, the second main hypothesis was also supported. This result indicates that cognitive capabilities play a central role in shaping auditors' professional decisions.

Regarding the subsidiary hypotheses, the findings indicated that mental process control had a positive and significant effect on decision-making and judgment behavior; therefore, the first subsidiary hypothesis was supported. Professional skepticism, with a path coefficient of 0.103 and a *t* statistic of 3.725, also had a positive and significant effect, supporting the second subsidiary hypothesis. This finding demonstrates that a critical approach and professional caution contribute to improving the quality of auditors' judgments.

The findings concerning decision review likewise indicated a positive and significant effect on auditors' decision-making and judgment behavior, thereby supporting the third subsidiary hypothesis. This suggests that reassessing and reviewing decisions before they are finalized contributes to improved professional judgment quality.

Furthermore, auditors' professional knowledge, with a path coefficient of 0.187, and professional experience, with a path coefficient of 0.257, both had positive and significant effects on decision-making and judgment behavior. Therefore, the fourth and fifth subsidiary hypotheses were also supported. These findings highlight the importance of human capital, including specialized knowledge and practical experience, in improving the quality of professional decisions.

Regarding the sixth subsidiary hypothesis, the findings showed that cognitive biases had a positive and significant path coefficient. However, the hypothesis predicted a negative effect. Therefore, although the relationship between biases and decision-making behavior was statistically significant, the direction of the effect was contrary to the theoretical expectation of the study, and the sixth subsidiary hypothesis concerning the negative direction of the effect was not supported. This finding may indicate that, in the sample investigated, certain biases may have operated as mental heuristics that facilitated decision-making, or alternatively, that this relationship requires deeper theoretical and empirical explanation.

Overall, the structural model results indicate that all independent variables in the study exerted statistically significant effects on auditors' decision-making and judgment behavior. Among these variables, cognition, experience, and metacognition showed the strongest effects. The research model demonstrated adequate explanatory power, and the main hypotheses were supported, whereas the hypothesis concerning the direction of the effect of cognitive biases requires theoretical reconsideration.

To examine the decision-making and judgment behavior of auditors of the Supreme Audit Court in greater depth, the present study employed qualitative thematic analysis. This method, based on the framework proposed by Braun and Clarke (2006), enables the identification of major patterns and themes within qualitative data. Accordingly, semi-structured interviews were conducted with auditors and senior managers to collect their perspectives, experiences, and perceived challenges concerning professional decision-making and judgment processes.



Following the interviews, the textual data were analyzed through open coding. During this process, key concepts and statements were extracted and organized into 21 subcategories. These subcategories were subsequently grouped into six main categories associated with cognitive and metacognitive components. The identified categories were as follows:

Table 6. Qualitative Findings

Component	Main Categories	Illustrative Examples From Interviews	Relationship With Quantitative Findings
Metacognition	1. Mental process control 2. Professional skepticism 3. Decision review	Step-by-step planning of document analysis; exercising caution when confronted with contradictory data; reviewing decisions before finalization	The path coefficients for mental process control, professional skepticism, and decision review indicated positive and significant effects on decision-making behavior
Cognition	1. Professional knowledge 2. Experience 3. Cognitive biases	Mastery of standards and regulations; practical experience in rapid decision-making; identification of mental shortcuts and biases	The path coefficients for knowledge, experience, and biases indicated significant positive effects, although the direction of the bias effect was contrary to theoretical expectations
Auditors' decision-making and judgment behavior	Outcome of the combined cognitive and metacognitive process	Making accurate and well-documented decisions; assessing risks; analyzing and revising decisions	The overall path coefficients indicate the role of cognition and metacognition in decision-making

Mental Process Control: The interviewees emphasized the necessity of planning and organizing the stages of decision-making and continuously evaluating the available data. This finding indicates that skills related to monitoring mental processes are essential for improving the quality of professional decisions.

Professional Skepticism: When auditors encountered contradictory or insufficient information, they tended to conduct further examination and analysis. This approach performs a protective function by reducing the likelihood of professional errors.

Decision Review: Practical experience indicated that revising and reassessing decisions before finalization reduces errors and increases the accuracy of professional judgments.

Knowledge and Experience: The interviews indicated that mastery of professional standards and practical experience play important roles in improving decision-making and judgment. These findings are consistent with the quantitative results and demonstrate that knowledge and experience constitute central components of professional cognition.

Cognitive Biases: Although the auditors were aware of the presence of biases in decision-making, the qualitative analysis indicated that knowledge and experience may moderate the effects of these biases. The quantitative findings likewise demonstrated a statistically significant effect of cognitive biases; however, the direction of the effect was contrary to the theoretical prediction. This finding highlights the complexity of the interaction between cognitive biases, professional knowledge, and experience.

4. Discussion and Conclusion

The present study examined the effects of cognitive and metacognitive components on the decision-making and judgment behavior of auditors of the Supreme Audit Court and showed that both cognition and metacognition had significant positive effects on professional decision-making and judgment. Cognition exerted the strongest overall influence, with a path coefficient of 0.598, while metacognition also had a significant positive effect, with a path coefficient of 0.333. At the dimensional level, professional experience showed the strongest effect among the cognitive subcomponents, followed by knowledge and cognitive biases, whereas mental process control, decision review, and professional skepticism all significantly contributed to decision-making and judgment within the metacognitive domain. These findings demonstrate that auditors' professional judgments are not determined exclusively by technical competence or accumulated knowledge; rather, they emerge from the interaction between first-order cognitive resources and higher-order regulatory processes through which auditors monitor, question, and revise their own reasoning. This pattern is consistent with the broader behavioral auditing literature, which emphasizes that audit judgment reflects a combination of knowledge, cognitive style, psychological characteristics, professional skepticism, ethical orientation, and contextual factors rather than a purely mechanical application of standards (Afraini et al., 2025; Nugrahanti et al., 2025; Van, 2025). The findings also support recent attempts to conceptualize auditors' decision-making through an integrated cognition-metacognition framework in which professional knowledge, experience, bias awareness,

monitoring, skepticism, and review operate jointly (Mehranifar & Rahimi, 2025; Mehranifar et al., 2025; Pouraghajan et al., 2025).

The strongest direct effect in the structural model belonged to cognition, indicating that auditors' knowledge structures, experiential resources, and information-processing tendencies constitute the primary foundation of professional judgment. This finding is theoretically plausible because audit tasks require the interpretation of heterogeneous evidence, application of accounting and legal standards, recognition of risk patterns, and integration of multiple information sources under time and resource constraints. Professional knowledge provides auditors with the conceptual schemas needed to classify evidence and recognize relevant issues, while experience facilitates pattern recognition, faster retrieval of precedents, and more efficient differentiation between routine and exceptional cases. The significant effects of knowledge and experience found in this study are therefore consistent with evidence indicating that auditor competence, professional characteristics, and knowledge are central determinants of audit judgment quality (Handoyo & Andika, 2025; Ramadani et al., 2025; Van, 2025). The result also aligns with research showing that multiple forms of intelligence and broader cognitive capability can influence auditors' judgment and decision-making, indicating that professional performance depends on more than procedural familiarity alone (Ahmadi & Pourzamani, 2025). In addition, prior studies of intuitive audit decision-making suggest that accumulated experience gradually shapes expert judgment by enabling auditors to recognize salient cues and respond efficiently to familiar patterns (Kaviani et al., 2025). The present finding that experience had a stronger effect than knowledge is particularly meaningful in the context of public-sector auditing, where many decisions involve ambiguous, non-routine, and context-sensitive situations that cannot be resolved solely by reference to formal rules.

The positive and significant effect of metacognition confirms that the quality of auditors' judgments depends not only on cognitive capacity but also on the ability to regulate cognition. Mental process control, professional skepticism, and decision review each contributed significantly to decision-making and judgment, indicating that auditors benefit when they deliberately monitor their reasoning, challenge initial interpretations, and reassess decisions before finalization. This result is consistent with general metacognitive theory, which treats planning, monitoring, evaluation, and strategic control as essential mechanisms for improving performance in cognitively demanding tasks (Kassimi & Kassimi, 2025; Rahmat et al., 2025; Schempp et al., 2025). It is also supported by research showing that metacognitive monitoring is influenced by prior knowledge and cognitive style, suggesting that effective self-regulation requires both adequate cognitive resources and awareness of the limitations of one's own reasoning (Ager et al., 2025). The significant contribution of decision review in the present study is especially important because audit judgments are often formed iteratively rather than instantaneously. When auditors return to a preliminary conclusion, compare it with new evidence, assess alternative explanations, and test its consistency with standards, they engage in a metacognitive correction process that may reduce premature closure and overconfidence. The qualitative findings reinforced this interpretation by showing that interviewees emphasized stepwise planning, repeated evaluation of evidence, and reconsideration of decisions before finalization.

Professional skepticism was also positively associated with decision-making and judgment behavior, reinforcing its central role in audit quality. This finding is compatible with prior evidence that professional skepticism is shaped by cognitive style and personality and can improve auditors' capacity to evaluate evidence critically (Matitaputty et al., 2025). It also corresponds with findings that depletion of cognitive resources can weaken professional skepticism and consequently impair the quality of judgment and decision-making among forensic auditors (Shirowzhan & Fakhari, 2024). In the present study, auditors described a tendency to investigate contradictory or insufficient information more carefully, suggesting that skepticism operated as a protective mechanism against premature acceptance of evidence. This pattern is consistent with fraud-detection research emphasizing that auditors' ability to identify irregularities depends partly on professional competence, skepticism, independence, and a questioning orientation (Handoyo & Andika, 2025; Yanto et al., 2025). In public-sector auditing, professional skepticism may be especially important because auditors frequently encounter information produced within complex administrative structures where incentives, institutional pressures, and documentation practices may affect the completeness or neutrality of evidence. Accordingly, skepticism should be understood not as generalized distrust but as a regulated cognitive posture that prompts further verification when evidence quality is uncertain.



One of the most notable findings concerned cognitive biases. Although the theoretical framework anticipated a negative effect of cognitive bias on judgment, the observed path coefficient was positive and statistically significant. Therefore, the hypothesized direction was not supported. This result requires careful interpretation and should not be taken to imply that cognitive biases are inherently beneficial. A more plausible explanation is that the measurement may have captured heightened recognition or awareness of bias, the use of expert heuristics, or context-dependent shortcuts that facilitated decision efficiency in experienced auditors. The qualitative findings provide partial support for this interpretation because participants acknowledged the existence of cognitive shortcuts while simultaneously indicating that professional knowledge and experience could moderate their adverse consequences. Contemporary research has increasingly emphasized the complexity of cognitive bias in accounting and audit settings and has shown that biases can arise from anchoring, confirmation tendencies, framing, overconfidence, and prior information effects (Cristofaro et al., 2025; Wahyudi et al., 2025). Prior audit report information has likewise been shown to influence subsequent auditor decisions, indicating that professional judgments can be shaped by cognitive carryover from earlier information (Sánchez-Martín et al., 2024). The positive coefficient observed here may therefore reflect the distinction between maladaptive bias and functional heuristics. Experienced auditors may use simplified decision rules as efficient expert shortcuts while still controlling their more problematic consequences through review and skepticism. This interpretation is also consistent with studies highlighting the role of cognitive attributes in financial decision-making and the interaction of personality and cognitive processes in professional judgment (Araujo et al., 2025; Mallika & O, 2025).

The findings regarding experience further support this interpretation. Experience had a relatively strong positive effect on decision-making and judgment behavior, suggesting that practical exposure contributes substantially to the development of professional reasoning. Repeated engagement with audit problems may help auditors develop richer mental models, recognize recurring risk indicators, and evaluate the relevance of evidence more efficiently. This result aligns with research emphasizing the importance of knowledge, skills, and attitudes in shaping auditor behavior (Ramadani et al., 2025) and with studies of auditor characteristics showing that judgment performance is influenced by individual professional attributes (Van, 2025). Experience may also contribute indirectly by strengthening metacognitive calibration. An experienced auditor is more likely to recognize situations in which intuitive judgments are reliable and situations in which additional verification is necessary. In this respect, cognition and metacognition should not be regarded as separate systems but as mutually reinforcing processes. The present results support this view because the quantitative model showed significant effects for both domains, while the qualitative findings indicated that auditors integrated professional knowledge, experience, skepticism, mental control, and review during complex decisions.

The study also contributes to the growing literature on psychological and ethical determinants of audit judgment. Although ethical variables were not directly included in the structural model, the findings are compatible with evidence that ethical ideology, moral intensity, professional ethics, emotional intelligence, and related characteristics influence auditors' decisions (Al Ali et al., 2025; Oktryani et al., 2025; Rajest et al., 2024; Rasita et al., 2025). Cognitive and metacognitive mechanisms likely provide part of the process through which these ethical dispositions influence professional behavior. For example, an auditor may recognize an ethically problematic situation through cognitive appraisal, experience conflict between competing considerations, and then use metacognitive monitoring to reconsider an initially convenient judgment. Similarly, the relationship between personality and judgment observed in previous research suggests that cognitive regulation may mediate the translation of dispositional characteristics into professional outcomes (Matitaputty et al., 2025; Mirashrafi et al., 2025). The current results therefore extend the behavioral audit literature by showing that knowledge and experience alone do not fully explain judgment; the capacity to supervise and revise one's own reasoning is also central.

Another implication of the findings concerns the changing technological environment of auditing. Artificial intelligence, advanced analytics, and digital decision-support tools are increasingly incorporated into audit processes, yet their effectiveness depends on how auditors cognitively interpret and metacognitively evaluate technological outputs. Previous research has highlighted the role of artificial intelligence in audit judgment and the broader transformation of auditing in Industry 5.0 environments (Abdullah, 2025; Silva-Atencio & Silva-Atencio, 2025). Information technology has also been found to moderate relationships between auditor competence, time pressure, and audit quality (Budianto & Firmansyah, 2025). The



present findings imply that technological systems should be designed not merely to automate decisions but to strengthen auditors' cognitive and metacognitive capabilities. Decision-support tools can improve judgment when they facilitate access to relevant information, encourage alternative hypothesis generation, highlight anomalies, and prompt review, but they may be harmful if auditors accept outputs uncritically. Accordingly, the positive role of mental process control and skepticism observed in this study becomes increasingly important as algorithmic assistance becomes more prevalent.

The qualitative findings further strengthen the interpretation of the structural results. The six main categories extracted through thematic analysis corresponded closely with the quantitative dimensions and demonstrated that auditors experience decision-making as a combined cognitive-metacognitive process. Participants described deliberate planning, cautious examination of inconsistent information, review of decisions, application of professional knowledge, reliance on practical experience, and awareness of mental shortcuts. This convergence between qualitative and quantitative evidence enhances the credibility of the study because it demonstrates that the statistical relationships are reflected in auditors' lived professional experiences. The integration of the two methodological components also addresses a limitation of much prior research, which often examines individual determinants in isolation or relies predominantly on cross-sectional quantitative analysis (Nugrahanti et al., 2025; Pasolo, 2024). By combining structural modeling with thematic inquiry, the study provides a more comprehensive account of how auditors actually regulate reasoning during professional decisions.

Overall, the findings indicate that the quality of audit judgment is best understood through an integrated behavioral model in which cognition provides the informational and experiential foundation of decision-making and metacognition regulates how those resources are applied. The significant effects of knowledge, experience, mental process control, skepticism, and decision review support previous research emphasizing competence, behavioral characteristics, and self-regulatory processes in audit judgment (Mehranifar et al., 2025; Pouraghajan et al., 2025; Van, 2025). At the same time, the unexpected positive association between cognitive biases and decision-making behavior suggests that the distinction between harmful bias and expert heuristic processing deserves further investigation. In practical terms, the results imply that improving audit quality requires a dual strategy: strengthening professional knowledge and experience while simultaneously developing auditors' capacity to monitor, challenge, and revise their own reasoning.

This study has several limitations that should be considered when interpreting its findings. First, the quantitative component was based on self-report questionnaires, which may be influenced by social desirability, response style, and differences between perceived and actual decision-making behavior. Second, the cross-sectional design limits causal inference, because the observed associations represent relationships measured at one point in time rather than developmental or longitudinal effects. Third, although the sample included auditors from different organizational units and hierarchical levels, it was confined to the Supreme Audit Court, which may limit the generalizability of the findings to private-sector auditors, internal auditors, tax auditors, or auditors operating under different institutional arrangements. Fourth, the positive coefficient observed for cognitive biases may partly reflect the operationalization of the construct and requires cautious interpretation. Fifth, the qualitative phase relied on participants' retrospective descriptions of their reasoning processes, and such accounts may not fully capture unconscious cognitive mechanisms operating at the moment of decision. Finally, although the mixed-methods design improved interpretive depth, the study did not directly manipulate task complexity, time pressure, technological support, ethical conflict, or organizational pressure, all of which may interact with cognition and metacognition.

Future studies should examine the proposed relationships through longitudinal, experimental, and task-based research designs that allow stronger causal conclusions and direct observation of auditors' reasoning under controlled conditions. Researchers could manipulate task complexity, time pressure, evidence ambiguity, fraud risk, or decision-support availability to determine when cognitive and metacognitive capabilities become most influential. Additional studies should distinguish more carefully between maladaptive cognitive biases and functional expert heuristics, particularly because the present findings showed a positive relationship between the bias construct and decision-making behavior. Future models may also incorporate mediating and moderating variables such as emotional intelligence, personality, ethical orientation, organizational ethical culture, workload, technology reliance, professional rank, and audit specialization. Comparative studies across public-sector, private-sector, internal, forensic, and tax auditing environments would help establish the external validity of the model. Researchers could also use process-tracing techniques, think-aloud protocols, eye tracking, behavioral experiments, or digital audit simulations to capture real-time cognitive and metacognitive processes. Finally, future research should examine how



artificial intelligence and automated decision-support systems affect professional skepticism, confidence calibration, decision review, and the development or reduction of cognitive bias.

Audit organizations should design professional development programs that simultaneously strengthen technical competence and metacognitive regulation. Training should not be limited to accounting standards, legal requirements, and audit procedures; it should also include structured exercises in self-monitoring, alternative hypothesis generation, evidence challenge, confidence calibration, bias recognition, and decision review. Supervisory systems should encourage auditors to document not only what decision was reached but also why alternative interpretations were rejected. Formal review protocols can be designed to reduce premature closure and improve the quality of final judgments. Organizations should also promote mentoring and experience-sharing mechanisms through which less experienced auditors can learn expert reasoning patterns from senior auditors. Decision-support technologies should be introduced as tools that augment rather than replace professional judgment, and auditors should be trained to critically evaluate automated recommendations. Finally, an organizational culture that rewards questioning, reflection, evidence-based challenge, and the revision of initial judgments is likely to strengthen both the accuracy and defensibility of audit decisions.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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