

Content Validity of Auditors' Metacognitive Beliefs and Their Reflection on Auditors' Professional Judgment

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ABSTRACT

The aim of the present study was to examine the content validity of auditors' metacognitive beliefs and their reflection on auditors' professional judgment. In this study, using thematic analysis and expert interviews, the components of auditors' metacognitive beliefs were identified. In the quantitative section, the research hypothesis was tested using structural equation modeling and Smart PLS3 software. Data on auditors' metacognitive beliefs were collected through a researcher-made questionnaire, and a standard questionnaire was used to measure professional judgment. This mixed-methods approach systematically examined the relationship between metacognitive beliefs and professional judgment. The qualitative findings of the present study indicated four overarching themes (1- enhancement of auditors' professional self-awareness, 2- professional interactions and team coordination, 3- continuous learning and professional development, and 4- professional ethics and accountability), eleven organizing themes (the role of self-awareness in improving audit quality, risk management in a self-aware environment, improvement of cognitive processes in a professional environment, team coordination in a self-aware environment, professional response to criticism and feedback, interaction with emerging technologies in a professional environment, and auditors' professional development in a self-aware environment), and forty-three basic themes. Furthermore, the findings from the quantitative section showed that auditors' metacognitive beliefs have a positive and significant effect on their professional judgment. The results of this study indicate that metacognitive beliefs play a decisive role in improving auditors' professional judgment and help them make more accurate and less error-prone decisions when facing ambiguities and complexities in the auditing environment. These findings not only provide a deeper understanding of the cognitive and metacognitive processes influencing professional judgment, but also offer a practical framework for policymakers to enhance audit quality and increase public trust in financial reporting by designing training programs and professional standards based on strengthening metacognitive beliefs. Moreover, this study represents an important step toward developing auditors who are not only equipped with technical knowledge but also possess the metacognitive capabilities necessary to address complex professional challenges.

Keywords: Metacognitive beliefs, self-awareness, audit quality, professional judgment.

Introduction

Auditing is a judgment-intensive profession in which technical standards, ethical obligations, cognitive discipline, and contextual pressures converge in the production of assurance. Although audit procedures are formally structured by standards and methodological protocols, the quality of the final audit outcome depends heavily on the auditor's ability to interpret evidence, evaluate uncertainty, recognize risk signals, resist bias, and make defensible



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professional judgments. Professional judgment is therefore not merely a technical act; it is a complex cognitive and metacognitive process shaped by knowledge, experience, ethical sensitivity, self-regulation, and awareness of one's own reasoning. In contemporary audit environments, this issue has become increasingly important because auditors face expanding regulatory expectations, technological disruption, pressure from clients and deadlines, complex business models, and heightened public scrutiny. Recent studies on audit judgment have emphasized that auditor independence, professionalism, professional ethics, competence, and experience are core determinants of the quality of judgment and decision-making (1-3). However, these factors alone cannot fully explain why auditors differ in the accuracy, consistency, and defensibility of their judgments under similar professional conditions. This limitation highlights the need to examine deeper psychological and metacognitive mechanisms that shape how auditors monitor, evaluate, and regulate their own thinking during the audit process.

The concept of metacognitive beliefs provides a useful framework for understanding this deeper layer of professional judgment. Metacognition generally refers to individuals' awareness of and control over their own cognitive processes, including how they plan, monitor, evaluate, and revise their thinking. In auditing, metacognitive beliefs may influence how auditors become aware of uncertainty, recognize potential cognitive errors, evaluate the sufficiency of evidence, regulate confidence, and reflect on the consequences of their judgments. Mohamed and Lashine argued that metacognitive beliefs are directly relevant to professional judgment in auditing and may operate through ethical decision-making mechanisms, suggesting that auditors' beliefs about their own cognition can shape both judgment quality and moral sensitivity (4). This view is consistent with broader research showing that self-efficacy, psychological security, locus of control, and cognitive-emotional regulation influence professional behavior and decision-making under challenging conditions (5-8). Therefore, auditors' metacognitive beliefs can be understood as a professional resource that helps them manage uncertainty, control errors, and maintain judgment quality in complex audit environments.

Professional judgment in auditing is affected by both internal characteristics and external pressures. On the one hand, individual attributes such as personality traits, professional skepticism, ethical reasoning, psychological capital, and critical thinking influence the way auditors process information and respond to ambiguous evidence. Chen et al. showed that personality traits and professional skepticism affect auditor quality, indicating that judgment outcomes cannot be separated from the auditor's psychological profile (9). Similarly, studies have shown that dark personality traits may increase the tendency toward fraudulent behaviors or affect auditors' professional skepticism and judgment, especially when the workplace context reinforces or moderates these tendencies (10-12). Alizadegan et al. also demonstrated that personality type and professional ethics affect auditors' fraud detection ability through the theory of planned behavior and the role of professional skepticism (13). These findings suggest that audit judgment is inseparable from the cognitive and moral characteristics of auditors. Metacognitive beliefs may provide an integrative explanatory mechanism because they influence how auditors become aware of these internal tendencies, regulate their effects, and translate professional knowledge into reliable judgment.

On the other hand, external and organizational pressures can weaken judgment quality if auditors lack sufficient self-awareness and cognitive regulation. Time budget pressure, job pressure, organizational constraints, and social undermining can distort attention, reduce depth of analysis, and increase reliance on heuristic reasoning. Hendar and Harahap emphasized that time budget pressure, auditor experience, and competence influence audit judgment, showing that pressure conditions can affect the reliability of auditors' decisions (2). Sotoudeh et al. similarly found that job pressure and professional skepticism influence auditor judgment, indicating that pressure does not merely

create workload challenges but can also alter evaluative reasoning (14). In organizational settings, social undermining and dysfunctional interactions may damage professional performance and reduce the psychological safety required for reflective judgment (15). These pressures demonstrate why metacognitive beliefs are essential: auditors who can monitor their cognitive state, identify stress-induced bias, and regulate decision-making under uncertainty may be better equipped to maintain professional judgment quality despite environmental constraints.

The growing complexity of audit environments also requires auditors to integrate technical competence with adaptive learning and professional development. Contemporary auditors must interpret increasingly complex financial information, assess emerging risks, engage with digital systems, and evaluate organizational behavior under conditions of uncertainty. Research on professional performance has shown that auditor personality components are related to professional functioning, while psychological capital and experience improve judgment and professional decision-making quality (16, 17). Critical thinking also appears to play a central role in auditors' job performance, particularly when ethical reasoning acts as a mediating mechanism (18). These studies show that judgment quality is not produced only by accumulated experience; it also depends on reflective thinking, ethical interpretation, and the ability to evaluate one's own reasoning processes. Metacognitive beliefs are therefore important because they can support continuous learning, help auditors reinterpret prior experiences, and strengthen professional adaptability in changing audit conditions.

The role of technology further increases the importance of human judgment and metacognitive awareness. Artificial intelligence and advanced digital tools are increasingly used in audit planning, evidence analysis, anomaly detection, and risk assessment. While these technologies can improve audit efficiency and expand analytical capacity, they do not eliminate the need for human accountability, professional skepticism, and ethical judgment. Silva et al. emphasized that the auditing profession in the age of artificial intelligence must continue to focus on human judgment and accountability, because technological outputs still require interpretation, validation, and professional responsibility (19). Zhang and Guo showed that corporate ESG performance can improve audit efficiency from the perspective of audit latency, suggesting that audit processes are increasingly affected by broader informational and organizational systems (20). Munidewi et al. also highlighted the role of affective neuroscience in audit judgment and decision-making, indicating that future auditing research must consider not only rational-cognitive processes but also emotional and neurological dimensions of judgment (21). In this context, metacognitive beliefs become even more relevant because auditors must evaluate not only their own reasoning but also the reliability, limitations, and ethical implications of technology-supported evidence.

Professional ethics and accountability are another central dimension of audit judgment. Auditors' decisions have consequences not only for clients and organizations but also for investors, creditors, regulators, and the public. The disclosure of key audit matters, for example, can influence investor judgment and decision-making, showing that auditors' professional judgments are embedded in broader capital market consequences (22). Auditor independence, professional ethics, and professionalism have also been shown to affect audit judgment, reinforcing the idea that judgment quality depends on ethical positioning and resistance to conflicts of interest (1). Ethical reasoning and professional skepticism further influence the capacity to detect fraud and assess risk, especially when auditors encounter ambiguous or strategically manipulated information (11, 13). Metacognitive beliefs can strengthen this ethical dimension by helping auditors reflect on whether their judgments are being shaped by inappropriate confidence, social pressure, client influence, emotional reactions, or unconscious bias. Thus, metacognition is not merely a cognitive skill but also a professional safeguard.

Despite the growing body of research on audit judgment, most studies have examined separate predictors such as independence, competence, time pressure, personality traits, professional skepticism, experience, technology, and ethical reasoning. For instance, studies have addressed judgment and decision-making in audit firms, the influence of professional and psychological variables on judgment quality, the role of personality and skepticism in auditor quality, and the effects of pressure and competence on audit judgment (2, 3, 9, 17). Other studies have examined adjacent psychological constructs such as self-efficacy, psychological security, job embeddedness, and work engagement, which indirectly illuminate the importance of self-regulation and professional adaptation (5-7, 23). However, there remains a conceptual gap regarding the content structure of auditors' metacognitive beliefs and the way these beliefs are reflected in auditors' professional judgment. Without a validated content framework, it is difficult to measure auditors' metacognitive beliefs systematically or to design educational, regulatory, and organizational interventions aimed at improving judgment quality.

This gap is particularly important because audit judgment failures often occur not only because auditors lack technical knowledge but also because they fail to recognize the limitations of their own reasoning. Overconfidence, confirmation bias, insufficient professional skepticism, weak ethical reflection, and poor stress regulation can all undermine judgment even when auditors formally follow audit procedures. Studies on dark personality traits, fraud risk assessment, and fraudulent behavioral tendencies show that auditors' internal dispositions may affect risk perception and professional judgment in subtle ways (10, 12). Likewise, studies on job pressure and social undermining show that organizational conditions may interfere with reflective judgment and professional performance (14, 15). A metacognitive approach can integrate these fragmented findings by focusing on how auditors monitor and regulate the cognitive, ethical, emotional, and social influences that affect their judgments.

Accordingly, developing a content-based framework of auditors' metacognitive beliefs can contribute to both theory and practice. Theoretically, it can extend audit judgment research by identifying the cognitive and metacognitive dimensions through which auditors interpret evidence, manage uncertainty, interact with teams, respond to criticism, use technology, maintain independence, and sustain professional responsibility. Practically, such a framework can guide training programs, professional development systems, audit firm policies, and standard-setting initiatives aimed at improving audit quality. It can also support the design of valid measurement instruments for assessing auditors' metacognitive beliefs and examining their relationship with judgment outcomes. Given the growing complexity of audit practice, the expansion of artificial intelligence, the increasing importance of ethical accountability, and the persistence of pressure-related judgment risks, a systematic investigation of auditors' metacognitive beliefs is both timely and necessary (4, 19, 21).

The aim of the present study was to develop and validate the content framework of auditors' metacognitive beliefs and examine its effect on auditors' professional judgment.

Methods and Materials

The present study adopts a developmental research orientation in terms of its intended outcomes, as it seeks to construct and validate a conceptual framework for auditors' metacognitive beliefs—an area that has not been systematically modeled in prior research. From the standpoint of research purpose, the study is exploratory, aiming to identify and structure the underlying dimensions of auditors' metacognitive beliefs through expert-based inquiry and multi-stage coding procedures. In terms of data collection, the study follows a mixed-methods design, integrating qualitative and quantitative approaches. The philosophical foundation of the research is rooted in a

synthesis of voluntarism in the philosophy of reality and structuralism in the philosophy of science, resulting in an inductive–deductive methodological orientation. In the qualitative phase, data were collected through in-depth semi-structured interviews, which allowed both flexibility in eliciting expert insights and direction in aligning responses with the objectives of the study. The use of semi-structured interviews enabled the researcher to capture not only the explicit opinions of participants but also their underlying beliefs, perceptions, and professional experiences related to the phenomenon under investigation. The qualitative sample consisted of academic experts, auditing scholars with recognized expertise, professionals with substantial experience in auditing, and members involved in auditing standard-setting committees. A combination of purposive and snowball sampling techniques was employed. Initially, three experts were selected purposively based on their academic publications and professional background in auditing. Subsequently, additional participants were identified through referrals from initial interviewees, following the snowball sampling procedure. Data collection continued until theoretical saturation was achieved, defined as the point at which no new concepts or relationships emerged from the data. Ultimately, fifteen experts participated in the qualitative phase.

In the quantitative phase, the statistical population consisted of practicing auditors employed in the national auditing organization and private auditing firms during the study period. Due to the absence of an official sampling frame, the population was considered unlimited. Accordingly, the sample size was determined using Cochran's formula for an unknown population at a 95 percent confidence level, which yielded a required sample size of 384 respondents. To enhance the robustness of the findings, 400 questionnaires were randomly distributed among participants, of which 392 valid responses were returned and used for analysis.

Data collection tools in this study included both a researcher-developed instrument and a standardized questionnaire. To measure auditors' metacognitive beliefs, a researcher-made questionnaire was developed based on the findings of the qualitative phase. Specifically, grounded theory analysis following the approach proposed by Glaser (1992) was employed, involving open, axial, and selective coding procedures. This process led to the identification of four main categories, eleven components, and forty-three conceptual codes representing the structure of auditors' metacognitive beliefs. To ensure the reliability of these components, a Delphi technique was applied, and the elements were evaluated based on criteria including mean scores, agreement coefficients, and standard deviation. The results confirmed the reliability and stability of the identified components, forming the basis for the final questionnaire design. To measure auditors' professional judgment, the standardized questionnaire developed by Griffith et al. (2020) was utilized. This instrument consists of twelve items rated on a five-point Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). The use of a validated standard instrument ensured the construct validity and comparability of the professional judgment measure.

Data analysis was conducted in two stages corresponding to the qualitative and quantitative components of the study. In the qualitative stage, thematic analysis was performed using a three-stage coding process to extract basic, organizing, and overarching themes from interview data. This process facilitated the systematic development of the conceptual framework for auditors' metacognitive beliefs. In the quantitative stage, structural equation modeling using the partial least squares (PLS-SEM) approach was employed to test the research hypothesis concerning the impact of metacognitive beliefs on auditors' professional judgment. The analysis was performed using Smart PLS3 software, which is suitable for complex models and exploratory research contexts with latent variables. This analytical approach enabled the assessment of both the measurement model, including reliability and validity of

constructs, and the structural model, including path coefficients and significance levels, thereby providing a comprehensive evaluation of the proposed relationships.

Findings and Results

To describe the research sample, the demographic characteristics of participants in both the qualitative and quantitative phases were examined. In the qualitative phase, 15 experts participated in the interviews, while in the quantitative phase, 392 valid questionnaires were analyzed. Most participants in both phases were male, and the largest age group in the quantitative phase consisted of auditors aged 46 to 55 years. In terms of work experience, most qualitative participants had more than 10 years of professional experience, and the majority of quantitative respondents also reported more than 10 years of experience.

Table 1. Demographic Characteristics of the Research Participants

Variable	Category	Qualitative Phase n	Qualitative Phase %	Quantitative Phase n	Quantitative Phase %
Gender	Male	12	80.00	318	81.12
	Female	3	20.00	74	18.88
	Total	15	100.00	392	100.00
Age	Up to 45 years	2	13.00	38	9.69
	46–55 years	4	27.00	289	73.72
	Above 56 years	9	60.00	65	16.58
	Total	15	100.00	392	100.00
Work experience	Less than 10 years	4	26.67	138	35.20
	More than 10 years	11	73.33	254	64.80
	Total	15	100.00	392	100.00

To assess the validity of the qualitative coding process, triangulation was applied. Data-source triangulation confirmed the conceptual alignment of the organizing themes with prior scientific sources. Researcher triangulation was used to evaluate the interview and coding process, and the interpretations of several researchers were compared to reduce subjective bias. Methodological triangulation was established through the use of open and semi-open interviews, as well as initial coding during the interview process. Theoretical triangulation was also confirmed by linking organizing and overarching themes to relevant theories from management and related interdisciplinary fields. In the quantitative phase, Delphi analysis was used to assess the theoretical adequacy and applicability of the identified dimensions and components in the target population.

Because no coherent framework existed for auditors' metacognitive beliefs, thematic analysis was first used to identify the relevant components and themes. The initial literature search was conducted using keywords related to auditors' metacognitive belief patterns, including organizational pressures, personality traits, job satisfaction, individual perception, professional factors, and organizational culture. A total of 27 initial sources were identified. After several stages of screening based on content, title, and analytical relevance, 12 studies were retained. Critical appraisal was then performed with the participation of research experts based on criteria such as research objectives, methodological logic, research design, sampling, data collection, reflexivity, analytical rigor, theoretical expression, clarity of findings, and research value. Six studies that did not obtain the required score of more than 30 were excluded. The remaining studies were used to identify preliminary organizing themes. Organizational pressures, personality traits, and individual perception were excluded because their scores were below the mean

threshold, while cognitive processes, professional factors, and team coordination were retained as key organizing bases for the interview process.

Table 2. Screening of Organizing Themes Extracted from Prior Studies

Organizing Theme	Wang & Lent (2024)	Mulyanti et al. (2023)	Gibbas (2022)	Zhang & Zhou (2023)	Verchik et al. (2022)	Dwyer (2019)	Decision
Organizational pressures	–	–	✓	✓	–	–	Excluded
Personality traits	–	✓	–	–	–	–	Excluded
Cognitive processes	–	✓	✓	✓	✓	✓	Retained
Individual perception	–	✓	–	✓	–	–	Excluded
Professional factors	✓	✓	✓	✓	–	–	Retained
Team coordination	✓	✓	✓	✓	–	–	Retained

The results of the qualitative coding process showed that auditors' metacognitive beliefs consisted of four overarching themes, eleven organizing themes, and forty-three basic themes. These themes were extracted from expert interviews and, where applicable, supported by prior studies.

Table 3. Extracted Overarching, Organizing, and Basic Themes of Auditors' Metacognitive Beliefs

Main Category	Overarching Theme	Organizing Theme	Basic Themes
Auditors' metacognitive beliefs	Strengthening auditors' professional self-awareness	Role of self-awareness in improving audit quality	Effect of self-awareness on reporting accuracy; improvement of professional judgment in a self-aware environment; reduction of cognitive errors in the audit process
Auditors' metacognitive beliefs	Strengthening auditors' professional self-awareness	Risk management in a self-aware environment	Identification of complex risks; decision-making under uncertainty; maintaining work quality under difficult conditions; stress management in complex environments
Auditors' metacognitive beliefs	Strengthening auditors' professional self-awareness	Improvement of cognitive processes in the professional environment	Evaluation of auditors' mental processes; control of cognitive errors in a supportive environment; strengthening auditors' self-awareness in auditing; learning from past experiences; improvement of cognitive skills
Auditors' metacognitive beliefs	Professional interactions and team coordination	Team coordination in a self-aware environment	Effective interaction with audit teams; increased team coordination and efficiency; management of intra-team conflicts; acceptance of constructive criticism; use of feedback to improve performance
Auditors' metacognitive beliefs	Professional interactions and team coordination	Professional response to criticism and feedback	Acceptance of constructive criticism; use of feedback for performance improvement; strengthening professional flexibility; improved adaptation to changing environments
Auditors' metacognitive beliefs	Professional interactions and team coordination	Interaction with emerging technologies in the professional environment	Adaptation to advanced technological tools; optimal use of technology in auditing; improvement of accuracy through emerging technologies; increased team efficiency
Auditors' metacognitive beliefs	Continuous learning and professional development	Auditors' professional development in a self-aware environment	Professional training to strengthen auditors' skills; improvement of cognitive skills; learning from past experiences; adaptation to changing environments
Auditors' metacognitive beliefs	Continuous learning and professional development	Flexibility in facing organizational changes	Adaptation to changes in standards; flexibility in facing new regulations; adaptation to changing environments; maintaining work quality under difficult conditions
Auditors' metacognitive beliefs	Professional ethics and accountability	Maintaining independence and neutrality in the professional environment	Strengthening auditors' independence in decision-making; management of conflicts of interest; maintaining neutrality in audit reports
Auditors' metacognitive beliefs	Professional ethics and accountability	Auditors' social accountability	Increasing auditors' accountability to society; enhancing public trust in audit reports; strengthening the role of auditing in financial transparency
Auditors' metacognitive beliefs	Professional ethics and accountability	Managing professional pressures in a self-aware environment	Auditors' performance under time pressure; stress management in complex environments; maintaining work quality under difficult conditions; decision-making under uncertainty

After identifying the qualitative components, Delphi analysis was used to evaluate the reliability and expert consensus regarding the extracted components. The results showed that all components were confirmed. The mean values of the main components were above 5, and all agreement coefficients were higher than 0.50, indicating acceptable expert agreement and confirming the suitability of the components for constructing the questionnaire.

Table 4. Delphi Analysis of the Identified Components

Category	Component	Round 1 Mean	Round 1 Agreement Coefficient	Round 2 Mean	Round 2 Agreement Coefficient	Result
Strengthening auditors' professional self-awareness	Role of self-awareness in improving audit quality	5.84	0.91	6.04	0.92	Confirmed
Strengthening auditors' professional self-awareness	Risk management in a self-aware environment	6.05	0.85	5.69	0.84	Confirmed
Strengthening auditors' professional self-awareness	Improvement of cognitive processes in the professional environment	5.40	0.70	6.00	0.80	Confirmed
Professional interactions and team coordination	Team coordination in a self-aware environment	5.30	0.65	5.50	0.75	Confirmed
Professional interactions and team coordination	Professional response to criticism and feedback	6.01	0.82	5.74	0.84	Confirmed
Professional interactions and team coordination	Interaction with emerging technologies in the professional environment	5.82	0.90	6.11	0.87	Confirmed
Continuous learning and professional development	Auditors' professional development in a self-aware environment	6.05	0.85	5.69	0.79	Confirmed
Continuous learning and professional development	Flexibility in facing organizational changes	5.40	0.73	6.03	0.83	Confirmed
Professional ethics and accountability	Maintaining independence and neutrality in the professional environment	5.30	0.65	5.45	0.81	Confirmed
Professional ethics and accountability	Auditors' social accountability	6.01	0.88	5.76	0.79	Confirmed
Professional ethics and accountability	Managing professional pressures in a self-aware environment	5.30	0.67	5.44	0.85	Confirmed

In the quantitative phase, structural equation modeling was conducted after assessing the measurement, structural, and overall model fit. The predictive relevance of the model was evaluated using the Stone–Geisser nonparametric test. The Q^2 values showed that none of the values were negative, indicating that the model had acceptable predictive relevance. The GOF index was also calculated using the mean communality and mean R^2 values. The obtained GOF value was 0.785, which indicates a very strong overall model fit.

Table 5. Predictive Relevance and Overall Model Fit Indices

Dimension	CV Redundancy Q^2	CV Communality Q^2
Professional ethics and accountability	0.841	0.760
Auditors' metacognitive beliefs	—	0.658
Professional interactions and team coordination	0.720	0.598
Strengthening auditors' professional self-awareness	0.534	0.492
Auditors' professional judgment	0.728	0.749
Continuous learning and professional development	0.787	0.487
Latent Variable	Communality	R^2
Professional judgment	0.833	0.740
Mean Communality	Mean R^2	GOF

0.833

0.740

0.785

Confirmatory factor analysis was used to assess the measurement model. Based on the Fornell and Larcker (1981) criterion, factor loadings greater than 0.50 indicate acceptable validity. In the present study, all factor loadings were at least 0.790, and all t-values exceeded 1.96. Therefore, the observed indicators had significant effects on their corresponding latent constructs, and convergent validity was confirmed.

Table 6. Factor Loadings and t-Values of the Measurement Items

Construct	Component or Item	Factor Loading	t-Value
Metacognitive beliefs	Strengthening professional self-awareness	0.917	82.495
Metacognitive beliefs	Strengthening professional self-awareness	0.920	91.923
Metacognitive beliefs	Strengthening professional self-awareness	0.790	36.828
Metacognitive beliefs	Professional interactions and team coordination	0.889	42.756
Metacognitive beliefs	Professional interactions and team coordination	0.919	81.057
Metacognitive beliefs	Professional interactions and team coordination	0.942	22.302
Metacognitive beliefs	Continuous learning and professional development	0.936	94.431
Metacognitive beliefs	Continuous learning and professional development	0.939	14.893
Metacognitive beliefs	Professional ethics and accountability	0.983	30.026
Metacognitive beliefs	Professional ethics and accountability	0.965	11.378
Metacognitive beliefs	Professional ethics and accountability	0.976	55.158
Professional judgment	Item 1	0.928	77.158
Professional judgment	Item 2	0.928	80.713
Professional judgment	Item 3	0.939	95.872
Professional judgment	Item 4	0.965	54.067
Professional judgment	Item 5	0.949	94.885
Professional judgment	Item 6	0.944	10.606
Professional judgment	Item 7	0.818	28.166
Professional judgment	Item 8	0.955	10.635
Professional judgment	Item 9	0.805	26.362
Professional judgment	Item 10	0.924	72.510
Professional judgment	Item 11	0.900	61.641
Professional judgment	Item 12	0.883	48.151

The results of convergent validity and reliability showed that all constructs had acceptable internal consistency. Cronbach's alpha, rho, and composite reliability values were above the recommended threshold, and all AVE values were above 0.50. Therefore, the reliability and convergent validity of the constructs were confirmed.

Table 7. Convergent Validity and Reliability

Dimension	Cronbach's Alpha	Rho	Composite Reliability	AVE
Professional ethics and accountability	0.974	0.974	0.983	0.950
Auditors' metacognitive beliefs	0.966	0.971	0.971	0.754
Professional interactions and team coordination	0.906	0.913	0.941	0.842
Strengthening auditors' professional self-awareness	0.848	0.847	0.909	0.771
Auditors' professional judgment	0.981	0.983	0.984	0.833
Continuous learning and professional development	0.862	0.862	0.935	0.879

Discriminant validity was assessed using the Fornell and Larcker (1981) criterion. The square root of AVE for each construct was greater than its correlations with other constructs. Therefore, discriminant validity was confirmed. The R^2 value also showed that auditors' metacognitive beliefs explained 74.00 percent of the variance in auditors' professional judgment, while the adjusted R^2 was 0.739.

Table 8. Discriminant Validity, R^2 Values, and Hypothesis Testing

Construct	1	2	3	4	5	6
Professional ethics and accountability	0.975					

Auditors' metacognitive beliefs	0.468	0.868				
Professional interactions and team coordination	0.493	0.553	0.917			
Strengthening auditors' professional self-awareness	0.574	0.559	0.435	0.878		
Auditors' professional judgment	0.655	0.469	0.457	0.451	0.913	
Continuous learning and professional development	0.642	0.567	0.535	0.447	0.556	0.937
Dependent Variable	R ²		Adjusted R ²			
Auditors' professional judgment	0.740		0.739			
Hypothesis	Path	Path Coefficient β		t-Value	Result	
Research hypothesis	Auditors' metacognitive beliefs → auditors' professional judgment	0.769		83.692	Confirmed	

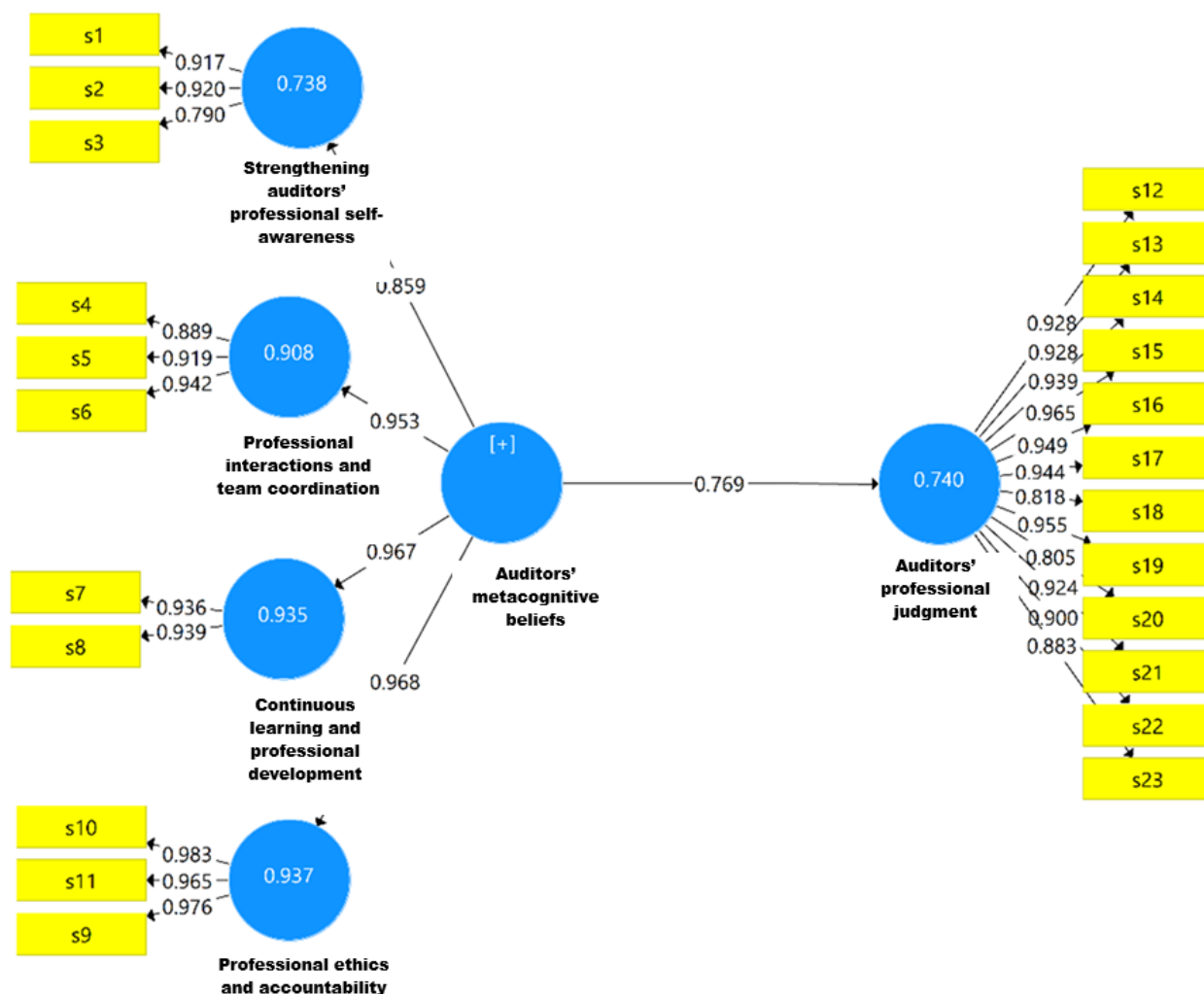


Figure 1. Structural Model of the Research Hypothesis with Factor Loadings

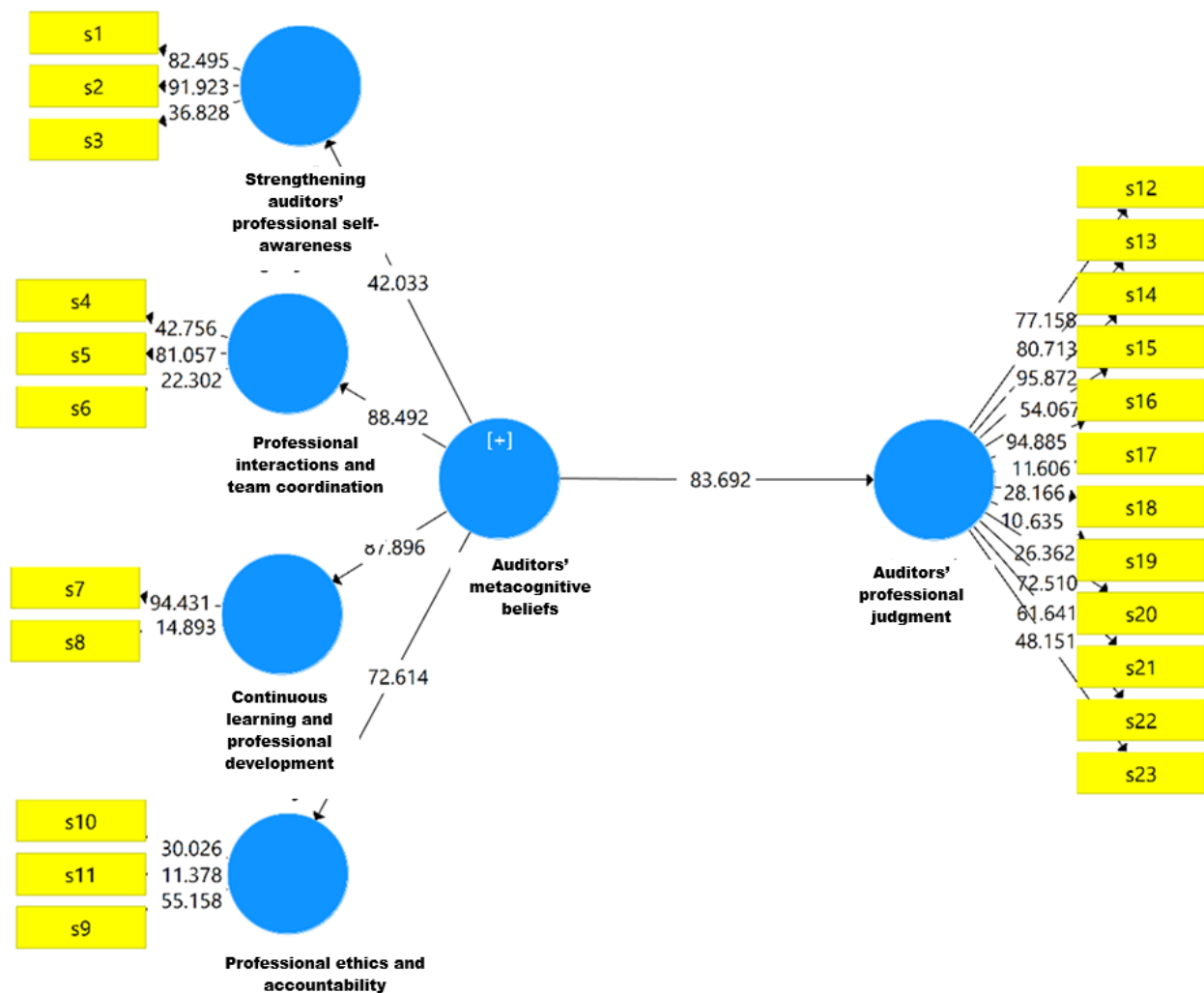


Figure 2. Structural Model of the Research Hypothesis with t-Values

The results of the structural model showed that auditors' metacognitive beliefs had a positive and significant effect on auditors' professional judgment. The standardized path coefficient was 0.769, and the t-value was 83.692. Since the t-value was greater than 1.96, the research hypothesis was confirmed. Therefore, stronger metacognitive beliefs among auditors are associated with higher levels of professional judgment.

Discussion and Conclusion

The findings of the present study provide robust empirical and conceptual support for the central role of auditors' metacognitive beliefs in shaping professional judgment. The results of the qualitative phase demonstrated that auditors' metacognitive beliefs are structured around four overarching domains, including strengthening professional self-awareness, professional interactions and team coordination, continuous learning and professional development, and professional ethics and accountability. These dimensions collectively reflect a multidimensional cognitive-behavioral system through which auditors interpret information, regulate their reasoning, and respond to professional challenges. In the quantitative phase, the structural equation modeling results confirmed that auditors' metacognitive beliefs have a strong, positive, and statistically significant effect on professional judgment, with a

substantial explanatory power for variance in judgment outcomes. This indicates that metacognitive beliefs are not merely peripheral psychological constructs but are central determinants of how auditors evaluate evidence, manage uncertainty, and make professional decisions.

The significant relationship between metacognitive beliefs and professional judgment is consistent with prior research emphasizing the importance of higher-order cognitive processes in auditing. Mohamed and Lashine demonstrated that metacognitive beliefs influence professional judgment through ethical decision-making pathways, suggesting that auditors who are more aware of their own thinking processes are better able to evaluate alternatives and make ethically grounded decisions (4). The present findings extend this perspective by showing that metacognitive beliefs operate across multiple dimensions, including self-awareness, cognitive regulation, social interaction, and ethical responsibility. This multidimensional structure provides a more comprehensive explanation of how auditors maintain judgment quality under complex and uncertain conditions. Furthermore, the strong path coefficient obtained in the structural model highlights that metacognitive beliefs function as a core cognitive resource that enables auditors to integrate technical knowledge with reflective thinking and contextual awareness.

The dimension of professional self-awareness identified in this study underscores the importance of auditors' ability to monitor and regulate their own cognitive processes. This finding aligns with studies showing that self-efficacy and psychological resilience play critical roles in professional performance and decision-making. For instance, Wang and Lent highlighted that self-efficacy enhances individuals' ability to cope with complex psychological challenges, which can be extended to auditors' ability to manage uncertainty and ambiguity in audit tasks (7). Similarly, Gibbs emphasized that self-regulation and locus of control are essential for maintaining effective professional functioning under pressure (5). The present study contributes to this literature by demonstrating that self-awareness is not only a psychological trait but also a structured metacognitive belief system that directly enhances audit quality through improved judgment accuracy and reduced cognitive errors. This is particularly important in auditing, where minor judgment errors can have significant financial and reputational consequences.

Another key finding relates to the role of professional interactions and team coordination in shaping metacognitive beliefs. The results indicate that auditors' ability to engage in constructive interactions, accept feedback, and manage team dynamics contributes to more effective professional judgment. This finding is consistent with research highlighting the social dimension of audit work, where knowledge sharing, communication, and collaborative problem-solving influence decision quality. Javadi et al. found that auditors' willingness to share knowledge and engage with colleagues enhances professional skepticism and judgment, particularly when moderated by workplace conditions (11). Similarly, Hendar and Harahap emphasized that professional competence and experience interact with organizational conditions to influence audit judgment (2). The present study extends these findings by showing that metacognitive beliefs provide a mechanism through which auditors interpret and utilize social interactions, transforming feedback and collaboration into improved cognitive processing and decision-making.

The dimension of continuous learning and professional development further highlights the dynamic nature of auditors' metacognitive beliefs. The results suggest that auditors who engage in ongoing learning, reflect on past experiences, and adapt to changing professional environments are more likely to produce high-quality judgments. This finding is supported by research indicating that professional performance is closely linked to learning orientation, adaptability, and cognitive development. Mulyanti et al. emphasized the role of self-efficacy and engagement in enhancing performance outcomes, suggesting that continuous learning contributes to sustained

professional effectiveness (23). Arefmanesh and Safari also showed that psychological capital and experience improve judgment quality, reinforcing the idea that cognitive growth and experiential learning are essential for effective decision-making (17). The present study integrates these insights by demonstrating that metacognitive beliefs act as a bridge between learning processes and judgment outcomes, enabling auditors to translate experience into improved cognitive strategies and more accurate evaluations.

Professional ethics and accountability emerged as another critical dimension of auditors' metacognitive beliefs. The findings indicate that auditors' awareness of ethical responsibilities, independence, and social accountability significantly contributes to the quality of their professional judgment. This is consistent with prior research emphasizing the importance of ethical reasoning and professional values in auditing. Akbar and Kuntadi demonstrated that auditor independence, professionalism, and ethics are key determinants of audit judgment, highlighting the ethical foundation of professional decision-making (1). Similarly, Heidari and Mashayekh showed that audit disclosures influence investor judgment, underscoring the broader societal implications of auditors' decisions (22). The present study adds to this literature by showing that ethical considerations are embedded within auditors' metacognitive belief systems, influencing how they evaluate information, manage conflicts of interest, and maintain objectivity. This suggests that strengthening metacognitive awareness may enhance not only cognitive performance but also ethical sensitivity and accountability.

The findings also highlight the importance of managing external pressures and environmental challenges through metacognitive regulation. Auditors often operate under time constraints, organizational pressures, and complex task environments, which can impair judgment quality if not properly managed. Sotoudeh et al. demonstrated that job pressure negatively affects audit judgment, particularly when professional skepticism is insufficient (14). Ebrahimi et al. further showed that social undermining and organizational dynamics can reduce professional effectiveness and decision quality (15). The present study suggests that metacognitive beliefs provide a protective mechanism against these adverse effects by enabling auditors to recognize stressors, regulate their cognitive responses, and maintain decision quality under pressure. This reinforces the idea that metacognition is essential for resilience in professional environments characterized by uncertainty and complexity.

Another important implication of the findings relates to the integration of technology and human judgment in auditing. As auditing increasingly incorporates artificial intelligence and advanced analytical tools, the role of human judgment remains critical. Silva et al. emphasized that despite technological advancements, auditors must retain responsibility for interpreting results and ensuring accountability (19). Munidewi et al. highlighted the role of affective and cognitive processes in audit judgment, suggesting that technology cannot fully replace human reasoning (21). The present study supports this view by demonstrating that metacognitive beliefs enable auditors to critically evaluate technological outputs, integrate them with professional knowledge, and make informed decisions. This suggests that future auditing practices should focus on enhancing auditors' metacognitive capabilities alongside technological competence.

The findings also provide insights into the role of personality and individual differences in audit judgment. Prior research has shown that personality traits, including dark personality characteristics, influence auditors' behavior and judgment quality (10, 12). Chen et al. further demonstrated that personality traits and professional skepticism jointly affect auditor quality (9). The present study contributes to this literature by showing that metacognitive beliefs may mediate the relationship between personality traits and professional judgment. By increasing self-awareness and cognitive regulation, metacognitive beliefs can mitigate the negative effects of undesirable personality traits

and enhance the positive effects of desirable traits. This highlights the potential of metacognitive training as an intervention for improving audit quality across diverse individual profiles.

Overall, the findings of this study contribute to the auditing literature by providing a comprehensive framework for understanding the role of metacognitive beliefs in professional judgment. Unlike prior studies that have focused on isolated factors, this study integrates cognitive, social, ethical, and developmental dimensions into a unified model. The strong empirical support for the relationship between metacognitive beliefs and professional judgment underscores the importance of incorporating psychological and metacognitive perspectives into auditing research and practice. This integration is particularly important in the context of increasing complexity, technological change, and heightened expectations for transparency and accountability in financial reporting (3, 20).

The study also reinforces the importance of critical thinking and ethical reasoning in audit performance. Eskoo et al. demonstrated that critical thinking improves auditors' job performance through ethical reasoning, suggesting that cognitive reflection and moral evaluation are interconnected processes (18). The present findings align with this perspective by showing that metacognitive beliefs encompass both cognitive and ethical dimensions, enabling auditors to evaluate evidence more effectively and make responsible decisions. This highlights the need for auditing education and professional development programs to focus not only on technical skills but also on cognitive and metacognitive competencies.

The results further indicate that metacognitive beliefs may enhance auditors' ability to adapt to changing professional environments. As auditing standards, regulatory requirements, and organizational practices evolve, auditors must continuously update their knowledge and adjust their cognitive strategies. The identification of continuous learning and professional development as a key dimension of metacognitive beliefs suggests that auditors who engage in reflective learning are better equipped to navigate these changes. This is consistent with research emphasizing the role of adaptability and learning orientation in professional performance (16). By fostering metacognitive awareness, auditors can improve their ability to learn from experience, anticipate challenges, and maintain high-quality judgment in dynamic environments.

One limitation of this study is that the qualitative phase relied on a relatively small number of expert participants, which may limit the generalizability of the identified themes. Although theoretical saturation was achieved, the perspectives captured may not fully represent all professional contexts or cultural environments. Additionally, the quantitative phase was based on self-reported data, which may be subject to response bias or social desirability effects. Another limitation is the cross-sectional design of the study, which does not allow for the examination of causal relationships over time. Furthermore, the study focused on auditors within a specific institutional context, which may limit the applicability of the findings to other regulatory or organizational settings.

Future research should expand the scope of investigation by including larger and more diverse samples across different countries and auditing environments to enhance the generalizability of the findings. Longitudinal studies could provide deeper insights into the causal relationships between metacognitive beliefs and professional judgment and examine how these relationships evolve over time. Experimental designs may also be used to test the effectiveness of metacognitive training interventions in improving audit judgment. Additionally, future studies could explore the interaction between metacognitive beliefs and technological tools, particularly in the context of artificial intelligence and data analytics. Investigating the role of organizational culture and leadership in shaping auditors' metacognitive beliefs may also provide valuable insights for improving audit quality.

From a practical perspective, the findings of this study suggest that audit firms, professional bodies, and policymakers should prioritize the development of auditors' metacognitive capabilities. Training programs should be designed to enhance self-awareness, critical thinking, ethical reasoning, and cognitive regulation. Professional standards may also incorporate guidelines for reflective practice and continuous learning to support the development of metacognitive skills. Audit firms can create supportive environments that encourage knowledge sharing, constructive feedback, and collaborative problem-solving, thereby strengthening the social dimension of metacognitive beliefs. Furthermore, integrating metacognitive training with technological education can help auditors effectively utilize advanced tools while maintaining high standards of professional judgment.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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