



## The effect of brainstorming, auditor ethics, and whistleblowers on audit opinions of government financial reports: The moderating role of management support




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### ABSTRACT

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This research aims to explore the impact of brainstorming (BR), auditor ethics (AE), and whistleblowers (WH) on audit opinions (AO). It also aims to assess the moderating role of management support (MS) in these relationships. The population of this study was 166 auditors from the Supreme Audit Agency (BPK-Badan Pemeriksa Keuangan) spread across the Papua region of Indonesia. The data were analyzed using Partial Least Square-Structural Equation Modeling (PLS-SEM) analysis. The findings show that there is a significant influence of brainstorming and auditor ethics on audit opinion, but whistleblowers do not influence audit opinion. In addition, management support moderates the influence of auditor ethics but not brainstorming and whistleblowers. Management that supports auditor ethics strengthens the positive effect of auditor ethics on audit opinions, ensuring that auditors can operate independently and objectively. However, the findings demonstrate that management support is unable to control the impact of brainstorming and whistleblowing on audit opinion, which is a result of other factors that are more important in influencing audit results. This research suggests that effective organizational management is crucial for maintaining auditor ethics and enhancing auditor independence in delivering unbiased audit opinions. Therefore, organizations must pay more attention to the role and support of management in creating a culture that supports integrity and ethics in the audit process.

**Contribution/ Originality:** This research is very important for governments globally in formulating policies for monitoring financial management and auditing transparent and accountable financial reports. Better understanding helps regulators, practitioners, and researchers ensure reliable audit opinions, increase confidence in financial reports, and increase public trust in government.

## 1. INTRODUCTION

Local governments play a significant role in providing quality public services for citizens. Transparency and accountability in local government financial management ensure public funds are used efficiently and effectively. Therefore, local government audit opinions are a very relevant and vital subject for research. Leverage has a positive effect on going concern audit opinion; then audit quality, profitability, and liquidity harm going concern audit opinion. At the same time, company size and audit do not affect going concern audit opinion (Averio, 2020). There is a negative relationship between accounting comparability and audit opinion proxies. In addition, there is a negative relationship

between financial reporting quality and audit opinion (Golmohammadi Shuraki, Pourheidari, & Azizkhani, 2021). This research describes several factors that influence local government audit opinions, including brainstorming practices in audits, auditor ethics, and the role of whistleblowers in providing information on potential irregularities or violations. The Republic of Indonesia Financial Audit Agency (BPK RI) emphasizes the importance of obtaining an unqualified opinion for entities, both ministries or institutions, as well as regional governments and other institutions. An unqualified opinion is the highest assessment of the quality of state financial management, which ensures that government accounting standards adequately present financial information. In the regional government sector, preparing financial reports requires extra effort. Weaknesses in the internal control system and limited human resources who understand government accounting are the causes. The complexity worsens because legislative and executive political interests in budget use tend to violate the rules. However, financial reports must still be presented transparently and with accountability. Brainstorming is a technique commonly used in audits to understand the risks related to the audit. It is a collaborative process for the audit team to identify potential irregularities or internal control weaknesses. The application of good brainstorming techniques strengthens audit integrity and accuracy, which has an impact on the final results of local government audit opinions. Auditor ethics is a crucial aspect of ensuring that audits are conducted with professionalism and integrity. Auditors with solid ethics can better identify potential problems with high accuracy, which can then influence the results of the audit opinion. In the context of local government, the use of public funds is crucial. It is essential to understand how auditor ethics play a role in determining audit results. Whistleblowers report illegal or unethical actions they witness, which can have a significant impact on the local government audit process. They provide invaluable information to auditors about potential irregularities or misuses of public funds. Therefore, the role of whistleblowers in the context of local government audits needs to be considered carefully. Management support includes support from management in the audit process, which has a significant role in influencing the results of the audit opinion. The influence can be moderating, that is, strengthening or weakening the effects of previous factors, such as brainstorming, auditor ethics, and whistleblowers. The research on the impact of brainstorming, auditor ethics, and whistleblowers on local government audit opinion, with the moderation of management support, is very significant due to the complexity and significance of these issues. This research provides a deeper understanding of how these factors interact and helps improve accountability and transparency in local government financial management. In addition, the results of this research provide practical guidance for auditors and local governments on improving audit quality and public fund management. Therefore, this research is feasible and relevant to carry out in order to improve overall regional government financial governance. Several researchers have studied the influence of brainstorming on audit opinion (Dennis & Johnstone, 2018; Oppong & Segbenya, 2023). Research finds that audit partner leadership is critical to achieving fraud brainstorming goals. Partners' leadership and subordinates' knowledge influence the brainstorming process and outcomes (Dennis & Johnstone, 2018). Other research shows that managerial skills are common across all industries and are standard across many sectors, while some of them are sector-specific, and these are both soft and hard skills (Oppong & Segbenya, 2023).

Several researchers have conducted studies on the impact of auditor ethics on audit opinions (DeZoort & Pollard, 2023; Díaz-Rodríguez et al., 2023; Juma'h & Li, 2023). Although internal auditors usually use root cause analysis (RCA), the study found that there are big differences in how organisations do it, how thorough it is, and how well it works (DeZoort & Pollard, 2023) because of things like lack of knowledge, limited resources, and concerns about independence and objectivity. Other research shows that the practical approach of implementing trustworthy AI systems allows for defining the responsibility of AI-based systems to the law through a specific audit process. Therefore, responsible AI systems are the idea we introduce in this work and an indispensable concept that can be realized through audit processes, according to the challenges posed by sandbox regulations (Díaz-Rodríguez et al., 2023). Another study found that auditors' knowledge of blockchain was positively related to their usage intentions, indicating optimism towards this technology. Their professional skepticism did not affect their intentions. However,

the perceived adequacy of accounting standards has the negative effect of weakening the influence of blockchain knowledge on intentions, revealing a status quo bias in blockchain use (Juma'h & Li, 2023).

Several researchers have studied the influence of whistleblowers on audit opinions (Clark & Skousen, 2023; Lin, Li, Xu, & Ding, 2023; Zhou, 2023). Their research revealed that while there are high levels of whistleblowing occurring in entrepreneurial companies (e.g., We Work, Uber, and Theranos), there is a lack of understanding of when and why whistleblowing occurs outside the company's domain- traditional large companies (Clark & Skousen, 2023). The research found that the impact of internal whistleblowing on a company's CSR performance is more pronounced in companies that have fewer financial constraints or have higher profitability, companies with less institutional share ownership and fewer analyst followings, and companies located in provinces with a more extraordinary cultural atmosphere. The positive impact of internal whistleblowing on corporate profits and market value is more substantial among socially responsible companies (Lin et al., 2023). Research finds that allegations of whistleblowing have an impact on the audit fees of similar companies and auditors' opinions regarding the effectiveness of internal controls. More specifically, audit fees increase, and auditors' issues more adverse opinions regarding internal controls following whistleblowing allegations. This impact will be more substantial when similar companies have a higher litigation risk and more internal control problems (Zhou, 2023).

Previous researchers have carried out management support studies (Afridi, Turi, Zaufishan, & Rosak-Szyrocka, 2023). A study reveals that users exhibit a strong inclination towards using digital communication tools. These tools have a notable influence on project performance, with the simplicity of use playing a key role in moderating the association between digital communication tools and project performance, as opposed to top management support (Afridi et al., 2023). Based on this research, no studies have been found involving management support as a moderator. Therefore, this research examines the influence of brainstorming, auditor ethics, and whistleblowers on audit opinions using management support moderation. The contribution of this research to state governments around the world is significant in educating and shaping public policies that encourage transparency and accountability in the scope of financial supervision and audit.

## 2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### 2.1. Agency Theory

Agency theory is a theory in economics and management that examines the relationship between company owners (principals) and managers who manage the company (agents). This theory assumes owners and managers have different interests in the company's operations. There are seven assumptions of the principal-agent relationship, namely: (1) self-interest, (2) conflicting goals, (3) bounded rationality, (4) information asymmetry, (5) efficiency advantages, (6) risk aversion, and (7) information as a commodity (Onjewu, Walton, & Koliouis, 2023). Agency theory views board independence as a characteristic of effective corporate governance. As a result, many boards have become independent, so more than 50% of S&P 1500 companies have only one internal director, namely a single CEO (Shaikh, Wang, & Drira, 2023). Owners want managers to operate efficiently, producing maximum profits, while managers may have personal motivations and goals that can conflict with owners' interests (Ma, Du, Xu, Wang, & Lin, 2022). The owner can create agency problems, namely a mismatch between the interests of owners and managers; problem agency theory proposes various control mechanisms, such as contracts, incentives, and monitoring, that can help ensure that managers act in the interests of owners (Shaikh & O'Connor, 2020). For example, performance-based incentives such as bonuses and stock options encourage managers to work harder and make decisions that benefit owners. Agency theory is essential in understanding how organizations manage agency problems that may arise between owners and managers (Delva, Forrier, & De Cuyper, 2021; Kump, 2023; Solomon, Bendickson, Marvel, McDowell, & Mahto, 2021). This theory provides a basis for developing effective control mechanisms so that managers are directed to act according to the owner's interests so that the company achieves its business goals

optimally. Control mechanisms are put in place not only because of agency concerns but also to improve cooperation and communication, provide signals to senior management, and be isomorphic with other projects (Virag, 2021).

## 2.2. Goal-Setting Theory

Goal-setting theory is a psychological framework that highlights the importance that goal-setting and management play in motivating individuals to achieve higher performance. When individuals have specific, challenging, but measurable goals, they are more likely to be motivated to achieve them. This goal-setting process encourages individuals to focus on relevant tasks, increase effort, and optimize their resources, resulting in improved performance (Shinkle, Hodgkinson, & Gary, 2021; Wengang, Fenglian, & Feng, 2023). Prudence is realized through behavior that is orderly, responsible, diligent, ambitious, obedient, and obeys rules and various desired outcomes such as work, health, and relationships (Bates, Enkhbat, Gray, Lee, & Zakharin, 2023).

The importance of goal-setting theory lies in its ability to provide structure and direction for individuals and organizations. By setting clear goals, both in work and personal contexts, individuals have strong guidance for their actions (Xu, Wang, & Wen, 2019). Managers and leaders should design appropriate reward systems to encourage the achievement of these goals. In practice, goal-setting theory is widely used in human resource management and individual development, helping people reach their best potential and achieve better results in various aspects of life. Clear climate goals that focus on problems, political decisions that are made with little thought, special-purpose administrative bodies with broad and clear duties, and targeted and ad hoc stakeholder collaboration are all examples of efficiency-oriented approaches (Hofstad, Millstein, Tønnesen, Vedeld, & Hansen, 2021).

## 2.3. Brainstorming (BR) and Audit Opinion (AO)

Brainstorming (BR) is a technique that is often used in the audit process to collect ideas, concepts, and input from audit team members to increase understanding of the risks in the client's financial statements. Employees from different sectors do not need the same managerial skills to function effectively, but each requires different skills (Oppong & Segbenya, 2023). In the context of an audit, BR is significant because it helps the audit team identify areas that need more profound attention during the audit. In BR sessions, audit team members discuss openly, ask critical questions, and share information to produce a comprehensive view of the audit situation.

The relationship with audit opinion (AO) is very close. The results of the audit process involving BR influence the AO given by the auditor. Flexibility is achieved thanks to an agent-based system that manages resources and operates them according to user requests (Kaeri, Sugawara, Moulin, & Gidel, 2020). If, during the audit process, the audit team succeeds in identifying and overcoming existing risks well, it is very likely that the AO given will be positive (for example, an unqualified opinion or a clean opinion). Conversely, if there are serious problems that cannot be resolved or if there is great uncertainty in the financial statements, the AO can be negative (for example, a qualified opinion or an adverse opinion). In China, groups of auditors, not companies or audit firms, are the core decision-making and responsibility units in the audit services market. Audit partner leadership is critical to achieving fraud brainstorming goals (Dennis & Johnstone, 2018). Therefore, BR is a crucial first step in determining the final results of the audit and influencing stakeholder confidence in the quality of the audited financial reports. The hypothesis is as follows:

*H1: The brainstorming (BR) affects the audit opinion (AO).*

## 2.4. Auditor Ethics (AE) and Audit Opinion (AO)

Auditor ethics (AE) are the principles and norms that regulate the behavior of an auditor in carrying out his duties. Auditor ethics is very important to maintain the integrity and independence of auditors, which are key elements in carrying out audits objectively and professionally. Codes of ethics, such as the International Code of Ethics for Independent Auditors, set out guidelines that auditors must follow in carrying out their duties. The code

of ethics covers various aspects, including independence, integrity, objectivity, and confidentiality, ensuring accurate and reliable audit results. Auditors' knowledge of block chain is positively related to their usage intentions, indicating optimism towards this technology (Juma'h & Li, 2023). In relation to AI, the AI system is responsible as an indispensable concept and is realized through the audit process, in accordance with the challenges posed by the use of sandbox regulations (Díaz-Rodríguez et al., 2023).

In relation to audit opinions (AO), auditor ethics are very relevant because they influence the final results of the audit process. Although the use of root cause analysis (RCA) is quite common among internal auditors, limited knowledge, limited resources, and concerns about independence and objectivity create large variations in the approach, thoroughness, and efficacy of RCA within organizations (DeZoort & Pollard, 2023). For example, auditor independence is a key element of producing a reliable AO. If the auditor is involved in a conflict of interest or has a relationship that affects his independence, this affects his objective assessment of the entity he is auditing. Auditors tend to issue opinions going-concern (GC) to financially distressed clients headquartered in states that have adopted such laws, particularly the good faith exception, versus clients in states that have not adopted such laws. Channels of state intervention that include state regulations relating to auditor responsibilities, director responsibilities, and shareholder litigation rights (Al-Hadi & Habib, 2023). Violations of auditor ethics damage the reputation of the auditor and the company being audited. This has an impact on public trust in financial reports. Therefore, maintaining high auditor ethics is important to ensure that the AO provided by the auditor reflects the actual conditions of the entity he is auditing and meets applicable audit standards. This is hypothesized as follows:

*H2: The auditor's ethics (AE) influences the audit opinion (AO).*

### 2.5. Whistleblower (WH) and Auditor's Opinion (AO)

A whistleblower (WH) is someone who voluntarily discloses confidential information or wrongful or illegal actions that occur within an organization or company. Reporting violations (whistleblowing) is a very controversial matter because the incidents often reflect fundamental failures in organizational governance, making leadership look bad (Clark, 2023). WH acts as a reporter who dares to reveal fraud, corruption, or other legal violations that may occur in the work environment. The research found companies and new ventures' status regarding whistleblowing on a unique data set of 3,113 reported frauds. From these findings, the research inductively theorizes a new model of whistleblower motivation that is driven by the unique entrepreneurial context that attracts people to join a cause and the consequences that must be paid if loyalty is not maintained (Clark & Skousen, 2023). The connection with audit opinion (AO) is very important because the information disclosed by a whistleblower is a factor that influences audit results. Auditors use the information provided by the WH to gather additional evidence or deepen their examination, which in turn influences the audit opinion given to the company being audited. If the whistleblower provides strong evidence of fraud or significant non-compliance, the auditor may provide a more negative opinion about the company's finances, potentially having a major impact on the organization's reputation and sustainability (Lin et al., 2023).

Additionally, in some cases, whistleblowers may reveal information that leads a company to make internal improvements or take legal action against individuals involved in illegal actions. Allegations of whistleblowing impact audit fees of similar companies and auditors' opinions regarding the effectiveness of internal controls (Zhou, 2023). More specifically, audit fees increased, and auditors issued more adverse opinions regarding internal controls following whistleblowing allegations. This improves the company's internal controls and increases the integrity of audited financial reports. Therefore, whistleblower involvement has a significant impact on audit opinion results. This plays a role in maintaining transparency and accountability in the world of business and finance. So, it is hypothesized as follows:

*H3: The whistleblower (WH) influences the audit opinion (AO).*

### 2.6. The Moderating Role of Management Support (MS)

Management Support (MS) is an important component in the context of organizational management, which aims to provide support to management in making the right decisions (Benthien et al., 2023). MS involves collecting, analyzing, and providing relevant and accurate information to management to enable them to make decisions based on data and facts. With MS, management identifies problems, monitors performance, plans strategies, and measures results more effectively. MS helps management prioritize tasks and efficiently allocate resources, thereby leading to improved overall organizational performance (Afridi et al., 2023).

In addition, MS includes support in the form of software and information systems that help management manage daily operations and business processes, including enterprise resource planning systems (Enterprise Resource Planning, ERP), customer relationship management systems (Customer Relationship Management, CRM), and advanced data analysis tools (Benthien et al., 2023). With the support of this technology, management automates most routine tasks, reduces human errors, and optimizes business processes. Overall, Management Support (MS) plays a role in ensuring the success and efficiency of the organization, helping management face complex challenges and develop in a dynamic business world. Hypothesis as follows:

*H4a: The management support (MS) moderates the effect of the brainstorming (BR) on audit opinion (AO).*

*H4b: The management support (MS) moderates the effect of the auditor ethics (AE) on audit opinion (AO).*

*H4c: The management support moderates the effect of the whistleblower (WH) on audit opinion (AO).*

## 3. METHODS

### 3.1. Research Design

This study looks into the effects of brainstorming, auditor ethics, and whistleblowing on audit opinion with management support. The model used to examine the effect is PLS-SEM. Our findings integrate previous studies' models, as presented in Table 1.

Table 1. Prior models comparison.

Model	Variables used					Result
	Brainstorming (BR)	Auditor ethics (AE)	Whistleblower (WH)	Audit opinion (AO)	Management support (MS)	
1: AE → AO 2: WH → AO Iskandar and Erlina (2023)		√	√	√		Supported
AE → AO Mahdi, Nurkholis, Prihatiningtias, and Baridwan (2023)		√		√		Supported
WH → AO Nurizal, Kuntadi, and Ramayani (2023)			√	√		Supported
AE → AO Duh, Gul, and Hsu (2022)		√		√		Supported
MS → AO Sanusi, Noor, Isa, Ghazali, and Rentah (2023)				√	√	Supported
BR → AO Edy, Said, and Nirwana (2021)	√			√		Supported

Table 1 demonstrates that the previous model included significant Audit Opinion variables but only examined them individually. As a result, our study integrates the partially independent variables into a unified model.

Furthermore, the model treated the Management Support variable as an independent variable rather than a moderator. The equation representing the research model is provided below.

$$AO = \beta_0 + \beta_1 BR + \beta_2 AE + \beta_3 WH + \beta_4 MS + \beta_5 BR.MS + \beta_6 AE.MS + \beta_7 WH.MS + \varepsilon \quad (1)$$

The variables are defined below:

$\beta_i$  = Coefficient for each variables.

BR = Brainstorming.

AE = Auditor ethics.

WH = Whistleblower.

MS = Management support.

$\varepsilon$  = Error term.

Figure 1 further supports the presented equation, which models MS as a moderating variable.

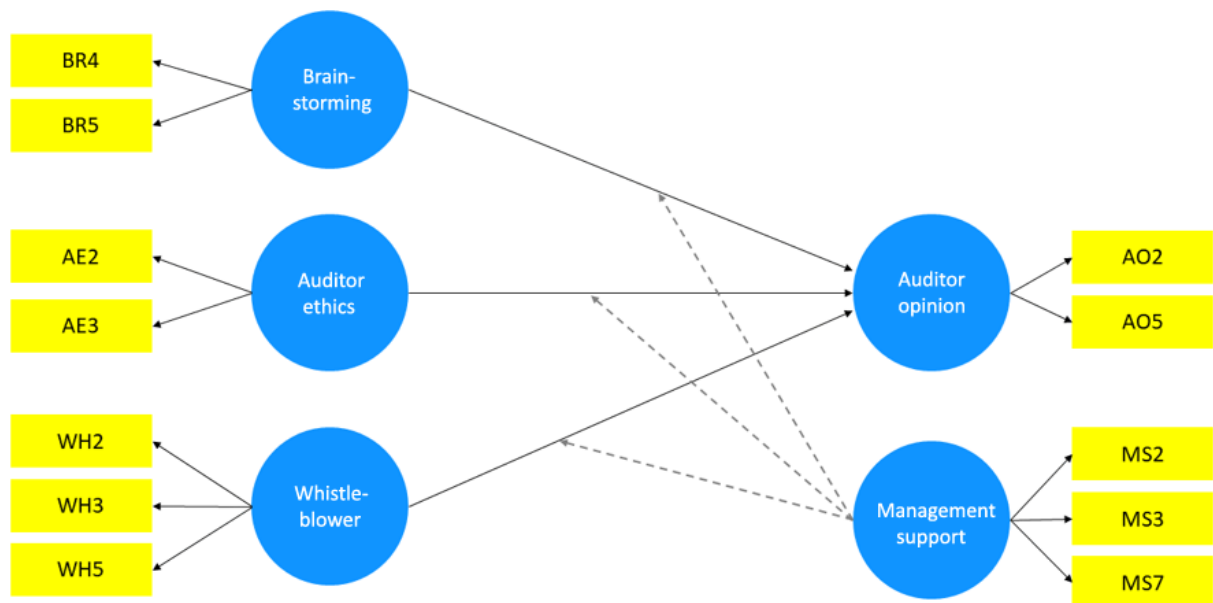


Figure 1. Research model.

### 3.2. Participants

The population of this study consists of 166 auditors from the Supreme Audit Agency, spread across the Papua region of Indonesia. The sampling method used is a census. At the Representative BPK for the provinces of Papua and West Papua, using purposive sampling. The two provinces are divided into two clusters, namely Papua Province, a Type A cluster with 97 auditors, and West Papua, a Type B cluster with 69 auditors. The reason the researcher chose the BPK RI auditor was that the auditor knew a lot about the practices of violating the code of ethics in government agencies, starting from Standard Operating Procedures, Internal Control Systems, budget planning, administration, accountability, and reporting. So, auditors are required to reveal the true facts, especially the auditor's position as an agent entrusted by the people to check the use of state money by the executive to implement sustainable development.

### 3.3. Data Collection

The survey questionnaire was designed into three parts according to the variables and research objectives. Question responses were adopted on a five-point Likert scale. The first part includes brainstorming (BR) variables; the second part measures the auditor ethics (AE) variable; the third part measures the whistleblower (WH) variable; the fourth part measures the management support (MS) variable; and the fifth section measures the auditor opinion (AO) variable. The questionnaire was distributed via Google Form.

### 3.4. Analysis

The data were analyzed using Partial Least Square-Structural Equation Modeling (PLS-SEM) analysis. Statistical tests were carried out for measurement models and structural models. A descriptive analysis of the variables was carried out. The PLS-SEM analysis involves evaluating the measurement model and structural model. The measurement model assessment determines convergent and discriminant validity. The structural model evaluation describes hypothesized relationships. SmartPLS 4 software was used for the analysis.

The initial stage of the analysis involves performing the PLS Algorithm analysis by computing the outer model's (measurement model's) value. Abbreviations of technical terms will be fully expounded upon their first use. The initial stage of the analysis involves performing the PLS Algorithm analysis by computing the outer model's (measurement model's) value. The resulting output includes outer loading, AVE, Cronbach's  $\alpha$ , Composite Reliability ( $\rho_A$ ), and Composite Reliability ( $\rho_C$ ). Outer loading gauges the correlation degree between latent variables and indicators, with indicators being deemed valid when the outer loading value is  $\geq 0.7$ . As a result, the researchers removed a number of indicators due to inadequate values. The Average Variance Extracted (AVE) is the degree of variance or variety of observable variables that can be attributed to underlying constructs. If the AVE value is  $\geq 0.50$ , the measurement model is considered to have convergent validity. Reliability is evaluated by analyzing the AVE to establish the legitimacy and dependability of the measurement model. There are three crucial metrics for assessing the dependability of the measurement model: Cronbach's  $\alpha$ , Composite Reliability ( $\rho_A$ ), and Composite Reliability ( $\rho_C$ ). The model is deemed reliable when all three values exceed or equal 0.60. Additionally, evaluating discriminant validity is crucial to ensuring the distinctiveness of each concept within a latent model. The Fornell-Larcker criterion is a common way to check if measurement models are discriminately valid. It says that the square root of the average variance extracted by a construct should be higher than the correlation between that construct and other constructs.

The following step involves evaluating the structural model utilizing the bootstrapping approach. Bootstrapping is a nonparametric method that enables the estimation of the statistical significance of various PLS-SEM outcomes, like path coefficients, Cronbach's alpha, and  $R^2$  values. The out-of-sample predictive power analysis method can assess the strength of the PLS-SEM model. This method compares the PLS-SEM model to the ordinary regression model for evaluating model strength. Three evaluation metrics, Root Mean Square Error (RMSE) and Mean Absolute Error (MAE), compare the predictive power of both models. If one model is smaller than the other, then it has relatively strong predictive power since the resulting error value is smaller.

The final stage of model evaluation involves conducting a robustness check, which verifies the model's consistency across a range of situations and conditions. To accomplish this task, researchers employed the nonlinear effects evaluation method, which is integral to ensuring the model's reliability. Bootstrapping is based on  $n = 10000$  bootstrap samples. Quadratic effects were assessed using a two-tailed test at the 5% significance level [2.5%, 97.5%].

## 4. RESULTS

### 4.1. Descriptive Statistics

Table 2 presents descriptive statistical data on the variables AO, BR, AE, WH, and MS. Descriptive statistical analysis is presented to display a measure of the centrality of the data that has been collected before presenting the inferential analysis.

Table 2 is the result of a descriptive statistical analysis of the five variables involved, namely AO (Audit Opinion), BR (Brainstorming), AE (Auditor Ethics), WH (Whistleblower), and MS (Management Support). This descriptive statistical analysis provides an overview of how the variable data is distributed in a sample consisting of 166 respondents. The number of samples (N) for each variable is 166, meaning that all the data is complete without any missing data. AO has a mean of about 4.01, BR has a mean of about 3.82, AE has a mean of about 3.97, WH has a mean of about 3.97, and MS has a mean of about 3.99. These averages provide an idea of the degree to which these variables tend to be high or low in the sample. The standard deviation measures the spread of data around the mean.



The greater the standard deviation, the greater the variation in the data. The AO variable has a standard deviation of around 0.535, which means that the variation in AO is quite large. Meanwhile, the MS variable has a standard deviation of around 0.476, indicating lower variation.

**Table 2.** Descriptive statistics.

Measures of data centering and dispersion	AO	BR	AE	WH	MS
N	166	166	166	166	166
Missing	0	0	0	0	0
Mean	4.01	3.82	3.97	3.97	3.99
Std. mean error	0.0415	0.0412	0.0407	0.0392	0.0370
Median	4.00	3.88	4.00	4.00	4.00
Standard deviation	0.535	0.531	0.524	0.505	0.476
Minimum	3.00	3.00	3.00	3.00	3.00
Maximum	5.00	4.88	5.00	5.00	4.86
Skewness	0.126	0.116	0.157	0.115	0.00594
Std. skewness error	0.188	0.188	0.188	0.188	0.188
Kurtosis	-1.06	-1.33	-1.07	-1.05	-0.995
Std. kurtosis error	0.375	0.375	0.375	0.375	0.375

Minimum and maximum values provide information about the data range. For example, the minimum and maximum values for AO are 3.00 and 5.00, indicating that the range of AO data is between 3 and 5. These values help understand how much the data varies from minimum to maximum value. Skewness measures the degree to which a data distribution tends to be skewed in one direction. All variables have a positive skewness close to zero, indicating a nearly symmetric data distribution. Then, kurtosis measures the degree of sharpness of the data distribution. All variables have a negative kurtosis close to zero, which indicates that the data distribution is relatively mesokurtic or less extreme compared to a normal distribution.

Thus, Table 1 provides information on the basic characteristics of each variable in the sample, including sample size, average, data distribution, data range, distribution shape, and level of sharpness of the data distribution. This data analysis information is crucial for developing statistical conclusions or comprehending the traits of the population the sample represents.

## 4.2. Model Evaluation

### 4.2.1. Reflective Measurement Model Evaluation

Reflective measurement model evaluation in Partial Least Squares Structural Equation Modeling (PLS-SEM) analysis is the process of evaluating the extent to which the indicators in the reflective model are able to measure the construct in question well. This involves testing the validity and reliability of indicators, such as confirmatory factor analysis (CFA), to ensure that the indicators significantly contain information about the construct being measured and that the measurement items have high factor loadings. In addition, analysis was conducted to identify items that may need to be modified or deleted to improve measurement quality. Evaluating this reflective model is important in PLS-SEM because it helps find the right and valid constructs that are used for further research into how the constructs in the structural model relate to each other.

**Table 3.** Factor loadings, reliability, and convergent validity estimates.

Construct/ Indicators	Outer loading	Reliability indicators	Convergent validity	Internal consistency reliability		
			AVE	Cronbach's $\alpha$	Composite reliability ( $\rho_c$ )	Composite reliability ( $\rho_c$ )
Brainstorming (BR)			0.773	0.707	0.708	0.872
BR4	0.887	0.787				
BR5	0.871	0.759				
Auditor ethics (AE)			0.760	0.684	0.689	0.863
AE2	0.885	0.783				
AE3	0.857	0.734				
Whistleblower (WH)			0.668	0.751	0.757	0.858
WH2	0.786	0.618				
WH3	0.797	0.635				
WH5	0.867	0.752				
Auditor opinion (AO)			0.765	0.694	0.695	0.867
AO2	0.881	0.776				
AO5	0.868	0.753				
Management support (MS)			0.687	0.770	0.772	0.868
MS2	0.846	0.716				
MS3	0.775	0.601				
MS7	0.863	0.745				

Table 3 is an evaluation tool used to assess the reflective measurement model, which involves five constructs: Brainstorming (BR), Auditor Ethics (AE), Whistleblower (WH), Auditor Opinion (AO), and Management Support (MS). This table provides information about how well the measurement instrument describes the construct. Outer loadings show the contribution of each indicator to the construct, with values ranging from 0.687 to 0.887. The reliability indicator measures the reliability of each indicator with a value between 0.601 to 0.783, indicating a good level of reliability. Convergent validity measures the extent to which indicators within a construct converge well, and values range from 0.668 to 0.773, indicating good convergent validity. Internal consistency reliability is measured through two methods, namely Cronbach's Alpha and Composite Reliability ( $\rho_c$ ). Cronbach's Alpha values ranged from 0.684 to 0.770, while Composite Reliability ( $\rho_c$ ) values ranged from 0.708 to 0.772, indicating adequate reliability in measuring these constructs. With these results, it can be concluded that the reflective measurement instrument in this research is reliable and has good convergent validity, so it is effective in measuring the variables of this research.

**Table 4.** Discriminant validity results based on Fornell-Larcker criterion.

Variable	AE	AO	BR	MS	WH
AE	0.872				
AO	0.696	0.875			
BR	0.724	0.726	0.879		
MS	0.736	0.726	0.739	0.829	
WH	0.720	0.703	0.759	0.754	0.818

Table 4 is a discriminant validity table using the Fornell-Larcker Criterion. Fornell-Larcker Criterion is a method used to evaluate the extent to which different constructs in a study can be differentiated from each other or the extent to which these constructs are truly unique and not too correlated with each other. The Fornell-Larcker criterion is interpreted as a measure that compares the square root of the AVE value with the relationship between latent variables. Thus, the square root value of each AVE construct must be greater than the correlation value with other constructs. This table provides insight into the relationships between the constructs measured in this study.

The diagonal of the table (from top left to bottom right) shows the correlation between each construct and itself, which is the square root of the AVE value.

In addition to the diagonal, special attention is paid to off-diagonal values indicating correlations between different constructs. These values reflect how strong or how low the correlation is between the constructs. In order to satisfy the requirements for discriminant validity, it is necessary for the correlation between distinct constructs to be minimal or approaching zero, hence enabling clear differentiation between the constructs. Based on Table 3, the square root AVE value is greater than the correlation between other constructs. Therefore, the measurement items have met discriminant validity.

#### 4.2.2. Structural Model Evaluation

Evaluation of the structural model in Partial Least Squares Structural Equation Modeling (PLS-SEM) is the process of assessing the extent to which the structural model that has been built is able to explain the relationship between constructs well. Several important parts of this evaluation are looked at, such as hypothesis testing about how variables are related using path significance tests and bootstrap tests and checking the structural model's goodness-of-fit. In addition, various metrics were analyzed such as R-squared ( $R^2$ ) to measure how well the model explains variations in endogenous variables (dependent variables), as well as moderation and mediation effects. The aim is to ensure that the structural model can explain the expected relationships well and provide a deep understanding of the relationships between the constructs being studied. Careful evaluation of structural models is essential in PLS-SEM because analysis results and research findings depend on the quality of these models.

Table 5. Hypothesis and path coefficients significance testing results.

Path/Hypothesis	$\beta$	t value	p-value	Sig. results	VIF	$f^2$	$R^2$	$Q^2$		
H1: BR $\rightarrow$ AO	0.299 [-0.125, 0.474]	3.341	0.001	Yes	3.149	0.080	0.644	0.609		
H2: AE $\rightarrow$ AO	0.181 [-0.020, 0.344]	2.186	0.029	Yes	2.790	0.033				
H3: WH $\rightarrow$ AO	0.158 [-0.003, 0.326]	1.883	0.060	No	3.102	0.023				
Moderator effect										
H4a: MS $\times$ BR $\rightarrow$ AO	0.067 [-0.122, 0.262]	0.696	0.486	No	2.793	0.004				
H4b: MS $\times$ AE $\rightarrow$ AO	-0.163 [-0.319, -0.005]	2.037	0.042	Yes	2.405	0.026				
H4c: MS $\times$ WH $\rightarrow$ AO	0.040 [-0.103, 0.193]	0.527	0.598	No	2.117	0.002				

Table 5 is the result of structural model evaluation using Partial Least Squares Structural Equation Modeling (PLS-SEM) which is a statistical method for testing the relationship between variables in research. In this table, there are several hypotheses tested to understand the relationship between various variables. The hypothesis is detailed in several sections, starting from H1 to H4c.

The coefficient ( $\beta$ ) is a value that indicates the extent to which the independent variable influences the dependent variable. The numbers in square brackets indicate the 95% confidence interval for the coefficient. The t-value test results measure the significance of the coefficient. In this case, a t-value greater than 1.96 indicates statistical significance. The p-value is a probability that indicates statistical significance. If the value is less than alpha (0.05), then the hypothesis is accepted.

A significant result is indicated by "Yes," while "No" indicates that the hypothesis is rejected. Variance Inflation Factor (VIF) measures multicollinearity between independent variables, and the higher the value, the greater the level of multicollinearity. f-square ( $f^2$ ) indicates how big the effect of the independent variable is on the dependent variable, while R-square ( $R^2$ ) measures the extent to which the model can explain the variability in the dependent variable. Q-square ( $Q^2$ ) is a measure of the model's ability to make out-of-sample predictions.

Based on the results in the table, it can be concluded that H1 (BR -> AO) and H2 (AE -> AO) are accepted because they have a fairly low p-value, indicating that Brainstorming (BR) and Auditor Ethics (AE) have a significant effect on Audit Opinion (AO). Meanwhile, H3 (WH -> AO) was rejected because the p-value was higher than the significance threshold. This shows that the Whistleblower (WH) does not have a significant influence on Audit Opinion (AO).

H4a (MS × BR -> AO) and H4c (MS × WH -> AO) in this study were also rejected due to the higher p-value. This shows that the interaction between Management Support (MS) and Brainstorming (BR), as well as Management Support (MS) and Whistleblower (WH), does not have a significant influence on Audit Opinion (AO). However, H4b (MS × AE -> AO) is accepted because it has a fairly low p-value. This shows that the interaction between Management Support (MS) and Auditor Ethics (AE) has a significant influence on Audit Opinion (AO). The structural model is visually shown in Figure 2.

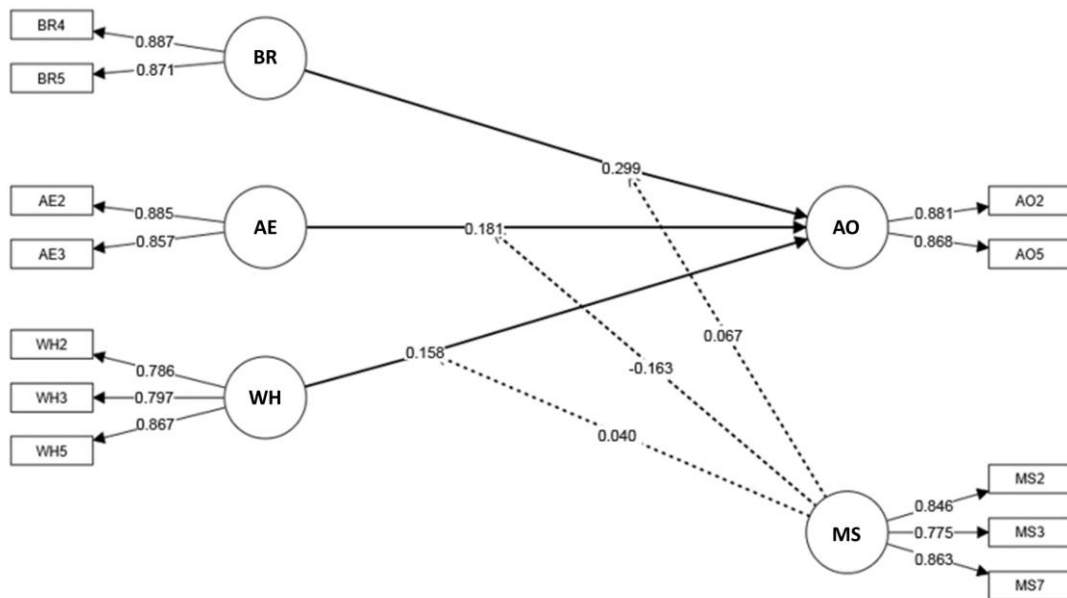


Figure 2. Structural model visualization.

Figure 2 is the final model, which has the most optimal structure. Several indicators were deliberately omitted because the outer loading and validity values did not meet the measurement criteria. In addition, measurements of predictive power can be seen in Table 6.

Table 6. Out-of-sample predictive power analysis.

Items	Q <sup>2</sup> predict	PLS-SEM		LM	
		RMSE	MAE	RMSE	MAE
AO2	0.489	0.500	0.441	0.513	0.443
AO5	0.437	0.472	0.418	0.485	0.422

Table 6 is the result of out-of-sample predictive power analysis for two statistical models: Partial Least Squares Structural Equation Modeling (PLS-SEM) and Linear Regression Model (LM) in the context of the AO (Audit Opinion) variable. In this table, there are three evaluation metrics used to compare the predictive power of the two models, namely Q<sup>2</sup>predict, Root Mean Square Error (RMSE), and Mean Absolute Error (MAE).

Q<sup>2</sup>predict is a metric that measures how much the model can predict data not used in the model training process. The higher the Q<sup>2</sup>predict value, the better the model predicts new data. At AO2 and AO5, PLS-SEM has a higher Q<sup>2</sup>predict than LM, which shows that PLS-SEM has better prediction capabilities.

RMSE and MAE are other metrics that measure how accurately a model predicts data. RMSE measures prediction accuracy by calculating the root mean difference between the actual value and the predicted value, while MAE measures the average prediction error without considering the direction of the error. In the case of RMSE and MAE, at AO2 and AO5, PLS-SEM has lower RMSE and MAE values than LM. It shows that PLS-SEM predicts AO data more accurately than LM.

Based on the results in the table, it can be concluded that the PLS-SEM model has higher predictive power than the Linear Regression (LM) model in predicting the AO (Audit Opinion) variable. The higher  $Q^2$  predict and lower RMSE and MAE values in PLS-SEM confirm this. Therefore, if the main goal is to make accurate predictions on AO variables, then the PLS-SEM model is a better choice.

#### 4.2.3. Robustness Check

A robustness check in PLS-SEM is a critical step to test how PLS-SEM analysis results remain consistent and valid in the face of variations or changes in data or analysis methods. The primary purpose of the robustness check is to ensure that the results of the PLS-SEM model do not only depend on the particular situation or conditions of the data sample used or the analysis method applied. Table 7 presents a nonlinear effect test to prove the robustness of the model.

Table 7. Nonlinear effects assessment results.

Nonlinear effects	$\beta$	t value	p-value	Sig. results	f <sup>2</sup>
BR → AO	0.014 [-0.088, 0.117]	0.267	0.790	No	0.001
AE → AO	-0.079 [-0.175, 0.025]	1.540	0.123	No	0.016
WH → AO	-0.014 [-0.114, 0.085]	0.271	0.787	No	0.000

Note: Bootstrapping based on n = 10000 bootstrap samples. Quadratic effects were assessed using a two-tailed test at 5% significance level [2.5%, 97.5%]. PCI = Percentile confidence interval.

Table 7 presents the robustness test of the PLS-SEM model in the relationship between variables, namely Audit Opinion (AO) as the dependent variable, while Brainstorming (BR), Auditor Ethics (AE), and Whistleblower (WH) as independent variables. This table provides the analysis results regarding the nonlinear effects of this relationship. The nonlinear coefficient ( $\beta$ ) measures the extent to which nonlinear effects influence the dependent variable. The results of t and p-value statistical analyses are used to determine the significance of nonlinear effects. The analysis results show that all nonlinear effects have a p-value more significant than the significance level of 0.05, which means these nonlinear effects are not significant. In addition, low f<sup>2</sup> values indicate that nonlinear effects do not significantly contribute to explaining the variability in the dependent variable (AO). In other words, this PLS-SEM model is robust against nonlinear effects because there is no firm evidence of nonlinear effects that must be considered in model analysis. It means that the BR, AE, and WH variables do not have a significant nonlinear impact on the AO variable in this model. Therefore, it can be concluded that the model presented in this analysis is considered robust to the nonlinear effects tested.

## 5. DISCUSSION

Based on research findings, there is an influence of brainstorming on audit opinion. This hypothesis has been proven for various reasons that can be explained. First, through brainstorming sessions, the auditor team can collaboratively discuss findings and questions that may arise during the audit process. It allows them to consider various points of view and alternatives in evaluating the evidence found. In this way, the possibility of missing or misinterpreting audit information can be minimized. In addition, brainstorming also facilitates better communication between auditor team members so that they can complement each other's knowledge and experience. Furthermore, this session can increase ethical considerations and professionalism in making audit decisions because auditors can together ensure that they have met applicable audit standards. As a result, the beneficial effects of brainstorming on

audit opinions are more obvious because better and more careful decision-making in evaluating the caliber of financial reports can affect the auditor's final opinion. Research reveals that partner leadership and subordinate knowledge jointly influence the brainstorming process and results (Dennis & Johnstone, 2018). Other research also reveals that managerial skills are common across all industries studied; others are general across many sectors, while some of them are sector-specific, and these are both soft and hard skills (Oppong & Segbenya, 2023).

The relationship with audit opinion (AO) is very close. The results of the audit process involving BR influence the AO given by the auditor. Flexibility is achieved thanks to an agent-based system that manages resources and operates them according to user requests (Kaeri et al., 2020). In China, groups of auditors, not companies or audit firms, are the core decision-making and responsibility units in the audit services market. Audit partner leadership is critical to achieving fraud brainstorming goals (Dennis & Johnstone, 2018).

Apart from that, auditor ethics influences audit opinion. Auditors who adhere to the code of ethics and principles of professionalism will be more likely to evaluate financial reports objectively and honestly, without any external pressure or influence that could lead to bias or conflict of interest. Strong ethics also assist auditors in avoiding actions that might call into question the integrity of the audit, such as conflicts of interest or ethical violations. As a result, good auditor ethics increase stakeholder confidence in audit findings, which in turn affects the auditor's audit opinion. Auditors who demonstrate a high level of ethics are more likely to provide reliable and independent opinions, strengthening the integrity and quality of audited financial reports. The following research explains that the system internal auditor responsible is the idea we introduce in this work and an indispensable concept that can be realized through audit processes, according to the challenges posed by the use of sandbox regulations (Díaz-Rodríguez et al., 2023). Other findings show that auditors' knowledge of block chain positively relates to their usage intentions, indicating optimism towards this technology. Their professional skepticism did not affect intentions, but the perceived adequacy of accounting standards had a negative effect, weakening the influence of block chain knowledge on intentions and revealing a status quo bias in block chain use (Juma'h & Li, 2023).

Auditors tend to issue opinions going-concern (GC) to financially distressed clients headquartered in states that have adopted such laws, notably the good faith exception, versus clients in states that have not adopted such laws. Channels of state intervention include state regulations relating to auditor responsibilities, director responsibilities, and shareholder litigation rights (Al-Hadi & Habib, 2023). Violations of auditor ethics damage the auditor's reputation and the company he or she audits. It has an impact on public trust in the financial reports he audits.

There is no influence from whistleblowers on audit opinions. Whistleblowers usually provide information or disclosures that could lead to further investigation by auditors. However, the influence of the whistleblower only sometimes changes the audit opinion. Auditors will continue to carry out audits by considering the evidence and findings they have collected during the audit process and comparing them with applicable audit standards. In addition, whistleblowers may have certain motives or interests in providing information, so auditors must carry out careful evaluations of the validity and relevance of the information. Therefore, the influence of whistleblowers on audit opinions is not always direct or automatic but depends on the extent to which the information provided influences the auditor's assessment of the audited financial statements. In order to make the influence on the audit opinion more indirect and difficult to assess, auditors must conduct their audit process independently and objectively without interference from outside parties, including whistleblowers. It is in line with findings that reveal that while there are high levels of whistleblowing occurring in entrepreneurial companies (for example, We Work, Uber, and Theranos), there is a lack of understanding regarding when and why whistleblowing occurs outside the domain of traditional large companies (Clark & Skousen, 2023). Other research also reveals that allegations of whistleblowing have an impact on the audit fees of similar companies and auditors' opinions regarding the effectiveness of internal controls. More specifically, audit fees increase, and auditors issue more adverse opinions regarding internal controls following whistleblowing allegations. This impact will be more substantial when similar companies have a higher litigation risk and more internal control problems (Zhou, 2023).

Reporting violations (whistleblowing) is very controversial because the incidents often reflect fundamental failures in organizational governance, thus making leadership look bad (Clark, 2023). Because the information that a whistleblower discloses affects audit outcomes, the connection with audit opinion (AO) is crucial. Auditors use the information provided by the WH to gather additional evidence or deepen their examination, which influences the audit opinion given to the company being audited. Suppose the whistleblower provides strong evidence of fraud or significant non-compliance. In that case, the auditor may provide a more negative opinion about the company's finances, potentially having a significant impact on the organization's reputation and sustainability (Lin et al., 2023).

Based on the moderation test in PLS-SEM, management support moderates the influence of auditor ethics on audit opinion. However, management support cannot moderate the influence of brainstorming and whistleblowing on audit opinion. Management that supports auditor ethics can strengthen the positive effect of auditor ethics on audit opinion, ensuring that auditors can operate independently and objectively. However, other factors that have a stronger influence on audit results may be to blame for the results showing that management support cannot moderate the influence of brainstorming and whistleblowing on audit opinions. For example, in the case of brainstorming, the session's success may depend more on the dynamics of the auditor's team and the quality of the process than on management support.

Similar to this, when it comes to whistleblowers, auditors may be more likely to rely on their audit processes and established procedures to evaluate the information they have provided, making management influence less important. Management support: management identifies problems, monitors performance, plans strategies, and measures results more effectively. Management support helps management prioritize tasks and allocate resources efficiently, improving organizational performance (Afridi et al., 2023).

## 6. CONCLUSION AND SUGGESTIONS

### 6.1. Conclusion

There is an influence of brainstorming on audit opinions. Through brainstorming sessions, the auditor team can collaboratively discuss findings and questions that arise during the audit process. Auditor ethics influence audit opinions. Auditors who adhere to the code of ethics and principles of professionalism are more likely to evaluate financial reports objectively and honestly, without external pressure or influence that leads to bias or conflicts of interest. There is no influence of whistleblowers on audit opinions. Whistleblowers usually provide information or disclosures that could lead to further investigation by auditors. However, the influence of whistleblowers does not always directly change audit opinions. Management support moderates the influence of auditor ethics on audit opinion. However, management support cannot moderate the influence of brainstorming and whistleblowing on audit opinions. Management that supports auditor ethics strengthens the positive effect of auditor ethics on audit opinion, ensuring that auditors can operate independently and objectively. However, the findings demonstrate that management support is unable to control the impact of brainstorming and whistleblowing on audit opinion, which is a result of other factors that are more important in influencing audit results.

### 6.2. Implications

The contribution of this research to state governments around the world is significant in educating and shaping public policies that encourage transparency and accountability in the scope of financial supervision and audit. With a better understanding of how auditor ethics, brainstorming processes, whistleblowers, and management influence audit outcomes, governments can take concrete steps to ensure integrity and quality in public and private sector financial reporting. This research is the basis for developing new guidelines and standards in audit and reporting practices implemented by regulatory bodies, helping to maintain transparency and accountability in the management of public funds, as well as increasing public trust in government institutions in a country and the private sector. As

such, this research makes a valuable contribution to improving governance worldwide, which in turn advances the interests and welfare of society more broadly.

This research implies that organizational management is essential in ensuring auditor ethics are upheld and strengthening auditor independence in providing objective audit opinions. Therefore, organizations must pay more attention to the role and support of management in creating a culture that supports integrity and ethics in the audit process. On the other hand, the results showing that management moderation has no effect in the context of brainstorming and whistleblowing indicate that auditors may rely on their audit procedures to assess such information. It can remind organizations to strengthen their audit procedures to ensure auditors can work independently and objectively in dealing with situations such as brainstorming and whistleblowing.

### 6.3. Limitation

However, this research also has several limitations. First, this research may be limited to a particular sample or context, so the results may not directly apply to all situations or organizations. Furthermore, this research only tests management moderation in the relationship between auditor ethics, brainstorming, whistleblowers, and audit opinions and does not consider other factors that might influence audit results.

### 6.4. Future Research

Future research could involve more diverse samples and more control variables to gain a more comprehensive understanding of the mechanisms that influence audit opinions. Recommendations for future research are to broaden the scope and deepen the analysis in understanding the influence of other factors and to consider a broader context and variables in exploring the relationships between these variables.

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**Transparency:** The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

**Data Availability Statement:** Upon a reasonable request, the supporting data of this study can be provided by the corresponding author.

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## APPENDIX

Appendix 1 presents the questionnaire items, which consist of 5 variables: Brainstorming (BR), Auditor ethics (AE), Whistleblower (WH), Auditor Opinion (AO), and Management support (MS). Some indicators were removed from each variable as these did not meet the outer loading criterion.

### Appendix 1. Questionnaire items.

Constructs/Indicators
Brainstorming (BR)
The main brainstorming session is held at the beginning of audit planning (BR4)
Before carrying out a brainstorming session, all team members must first identify the risk of auditee fraud (BR5)
Auditor ethics (AE)
Auditors must have a mindset that always questions and critically evaluates audit evidence. If creative accounting/Fraud occurs (AE2)
For every inspection result that I carry out, I provide an opinion based on reality, even though it will have a significant impact due to the risks of the findings (AE3)
Whistleblower (WH)
I still report every misappropriation finance country (Fraud) that occurred, although. Finally, I'm on a non-job or mutated (WH2)

I still report if auditees do creative accounting or fraud if evidence is found that is irrational and has a significant impact on the report finance (WH3)
If I know that the budget is not in favor of the people, but only in group interests, then I tend to reveal it to the public (WH5)
Auditor opinion (AO)
All exposure results inspection must be by the reality that happened on moment inspection (AO2)
All findings in I discussed the audit result report (LHP) with the audit team to obtain no further inspection findings (AO5)
Management support (MS)
The audit department/BPK RI representative office has a budget to carry out its duties and responsibilities in conducting audits (MS2)
The inspector provides adequate, reliable, and relevant reports on the work performed and recommendations made to management (MS3)
Management always responds positively to results reports inspection (LHP) and follow-up (MS7)

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