

HOW FUZZY LOGIC ANALYSIS IMPACT MATERIALITY LEVEL CONSIDERATION IN FINANCIAL AUDIT

¹BAMBANG LEO HANDOKO, ²ANG SWAT LIN LINDAWATI,

Accounting Department, School of Accounting, Bina Nusantara University, Jakarta, Indonesia, 11480

E-mail: ¹bambang.handoko@binus.edu, ²lindawati@binus.edu.

ABSTRACT

Materiality has a significant role in the course of accounting, especially when it comes to auditing. It helps the auditor by holding the limitations of time and resources of the auditor's capabilities in evaluating the financial misstatements. The amount of audit procedures and evidence is determined depending on the materiality of misstatements. However, some cases have shown that misstatements that happened below the materiality could eventually lead to a financial shenanigan. Our quantitative research tries to analyze the factors that could affect materiality level. We use agency theory as the foundation of this research. Several variables that relate to the auditor's judgment of materiality are used to gain an understanding of its impact on materiality considerations. We use primary data from audit questionnaires and perform a statistical analysis to assess our hypothesis. The results suggest that the auditor's ability to understand audit risk, auditor's competency, and fuzzy logic analysis have a significant effect on the materiality level consideration. More than that, this research also suggests that fuzzy logic analysis could be used to help auditors in determining materiality level and it is able to drive qualitative factors of materiality.

Keywords: *Risk, Competency, Auditor, Materiality.*

1 INTRODUCTION

The financial report is one part of the annual report which contains all information about financial conditions that occur during a certain period [1]. The report is prepared under the Statement of Financial Accounting Standards (PSAK) by the Indonesian Institute of Accountants (IAI). PSAK also regulates the methods used by companies in preparing financial statements. The information that is presented in financial statements can be used to analyze changes, performance, and financial conditions that are useful in making economic decisions [2]. Therefore, the company's internal management and parties outside the company such as investors, creditors, legal entities, and other parties who have an interest in the company could use financial statements as a basis for making decisions.

On the other side, company's management wants their financial condition to be in a good condition like a stable and exponential income, low expenses, lots of assets, and little debt. The information provided within the financial statements should have decent accuracy and integrity since it is used by many parties who rely on and have an interest in the company. But sometimes, management states information that is not showing

its factual financial condition. This leads to a problem in economic and social aspects [3]. In general, errors involving misstatements in financial statements are divided into two, namely those that are committed unintentionally and intentionally with certain aims and objectives. Thus we need parties who provide assurances that there are no intentional misstatements in financial statements.

According to Douglas in [4], an auditor is responsible for planning and conducting audit activities to assure that the financial statements do not have material misstatements. By knowing the risks that existed in the company, auditor can determine audit procedures and hence minimize the misstatement that may occur. While conducting an audit process, auditor should conduct more in-depth procedures if there are misstatements within the accounts of financial statements. However, auditor's limited time and resources are the obstacle to assess all misstatements. Therefore, auditor needs to consider the substantial misstatements that occur in financial statements.

According to the FASB, materiality is the level of misstatement that, to a certain extent, can affect the judgment of a party relying on the information. Materiality describes the magnitude of deviations in the financial statements which can be in the form of fraud or error and in the circumstances that can amend the decisions of those who use the financial

statements. Materiality assessment assists auditor in gathering sufficient evidence and makes auditor can assure that the financial statements does not contain material misstatements. In addition, the FASB states that auditor needs to make materiality judgments to form a plan of audit activities and to evaluate the evidence that exists after audit procedures are performed.

Moreover, in assessing the level of materiality, auditor could use two approaches which are quantitative consideration and qualitative consideration. Quantitative consideration focuses on the amount of misstatement compared to the aggregate of the financial statement accounts. Meanwhile, qualitative consideration is seen from the effect of misstatements on the users of financial statements [4]. According to Staff Accounting Bulletin (SAB), No. 99 explains that the use of quantitative judgments can be a basic assumption if a deviation is less than the aggregate number of financial accounts, then it is immaterial. However, this “rule of thumb” concept cannot replace a thorough analysis with other relevant considerations of financial statements. Hence, qualitative considerations are needed by the auditor in determining the level of materiality.

However, qualitative consideration is not a number that auditor can analyze like quantitative factors. Qualitative happen to be less subjective than quantitative consideration and contains ambiguity. Some studies showed that fuzzy logic analysis can be used to deal with those problems. According to [5], states that the concept of fuzzy logic is able to overcome the problem of data uncertainty and ambiguity in an environment.

This concept forms a classification of existing data and then categorizes the members belonging to each group (fuzzy sets). In this study, the use of fuzzy logic theory can assist auditors in considering the materiality of misstatements in financial statements. This theory can provide a novel approach to the qualitative judgment of misstatements. In addition, it could make auditors more flexible and accurate regarding the materiality of misstatements in financial statements.

Our paper contributes to auditors in public accounting firms, so that auditors use the artificial intelligence technique using fuzzy logic to assist in determining the level of materiality.

2 LITERATURE REVIEW

2.1 Agency Theory

Agency theory explains the relationship between the agent and the principal [6]. This theory tries to explain the loss of value that arises due to the actions of one party (agent) against another party. The application of agency theory can be seen from the relationship between company management (agents) who are paid by shareholders (principals).

[7] citing [8] stated that management introduced internal audit and other internal control mechanisms to inform shareholders that management is carrying out its responsibilities to maximize shareholder wealth. According to [9], agency theory is based on the idea that the agent has more information than the principal. This condition causes inequality on one side due to asymmetric information (asymmetry). This can affect the principal's ability to see whether their interest has been fulfilled by the agent or not. Agency theory has been one of the theories that play an important role in accounting for more than 25 years because it can be used as a model for researchers to develop conflicts of interest issues, incentive issues, and the need for third parties [10].

Agency theory assumes that the activities of an organization are driven by self-interest and contracts that govern the relationship between management, shareholders, and employees [7]. This theory also explains that both parties will act rationally and use the desired process to maximize the benefits of each party [9]. With the gap in meeting the interests of agents and principals, audit processes conducted both internally and externally are needed [6].

2.2 Effect of Understanding Audit Risk to Materiality Level Consideration

Auditor must be able to understand the risks of performing audit activities. Understanding audit risk can affect the auditor when conducting audit activities. Auditors need to conduct a risk assessment to understand the client thoroughly regarding the latest information on business activities, competitors, management, and company policies to understand the possibility of misstatements in financial statements [4]. In addition, auditor's awareness of audit risk can influence an auditor in determining the materiality of a misstatement. Research conducted by [11] describes the significant positive effect of understanding audit risk on the consideration of the level of audit materiality. Therefore, the researcher proposes a hypothesis:

H1: Understanding audit risk could affect the materiality level of misstatement.

2.3 Effect of Auditor's Competency to Materiality Level Consideration

Competence includes the ability and attitude of the auditor in making audit decisions. Good competence can increase the accuracy of the auditor in providing a statement of audit opinion. According to [12], auditor's competence is their ability to apply the knowledge and experience possessed in the audit field. With adequate audit competence, the auditor can conduct the audit process more thoroughly, accurately, and objectively so that the opinion generated by the audit on the financial statements is as per the evidence and actual conditions. Thus, audit competence can influence audit judgment in determining the level of audit materiality. Therefore, the researcher proposes a hypothesis:

H2: Auditor's competency could affect the materiality level of misstatement.

2.4 Effect of Fuzzy Logic Analysis to Materiality Level Consideration

The determination of the level of materiality among auditors is still using only quantitative and qualitative approaches. The quantitative approach is based on the threshold for the amount of financial statement misstatements, while the qualitative approach is based on the concerns of financial statement users. This approach relies on the professional judgment of the auditor. This is felt to be lacking because of the many wrong judgments from the auditors. That's why we added another variable, namely fuzzy logic. Fuzzy logic is a form of multi-valued logic that has a variable truth value in real numbers between 0 and 1.

In artificial intelligence (AI) systems, fuzzy logic is used to imitate human reasoning and cognition. Fuzzy logic is a development of binary logic. Binary logic only has 2 truth values, namely 0 or 1. Fuzzy logic includes 0 and 1 as extreme truth values but with varying degrees of intermediate truth.

Fuzzy logic is often used to analyze the characteristics of a system. The uncertainty or ambiguity of data could be solved with the concept of fuzzy or randomness [5]. The fuzzy logic analysis will provide categorized data that could be used by their users to make decisions. Moreover, the research that is conducted by [13] established a system using fuzzy logic to combine quantitative and qualitative considerations in determining the level of the materiality of misstatements. Their research concludes that qualitative consideration

could measure as in quantitative approach. Therefore, the researcher proposes a hypothesis:

H3: Fuzzy logic analysis could affect the materiality level of misstatement.

3 RESEARCH METHODOLOGY

This research uses a quantitative approach for the research method. According to [14], quantitative research focuses on the gathering and interpretation of statistical data that will be used to analyse the determining variables. We use primary and secondary data to assess the hypothesis. The sampling technique in this research is non-probability sampling with a purposive sample which is based on certain characteristics or criteria [15]. According to [16], if there is no exact data for the total population, the number of samples could be determined using an unknown population equation. In this study, the sample needed is 96.04 or 100 with 0,25 standard deviation and 5% significance.

The primary data comes from the questionnaire that we collected from auditors that is currently working in public accountant firms around Jakarta and Tangerang which is in Indonesia. The questionnaire contains closed answers which we provide in a multiple-choice Likert Scale to prevent a non-related answers and to simplify the data processing. The researchers gathered the questionnaire using Google Form and analysed using Smart PLS 3 and Microsoft Excel. Meanwhile, secondary data is collected from online books, journals, and other related articles.

This research is using Structural Equation Method (SEM) with Partial Least Square (PLS). According to [17], SEM is the development of path analysis which determines the causal relationship between exogenous and endogenous variables. Exogenous variables are variables that are the cause of changes and the emergence of the dependent variable (endogenous), both positively and negatively. Meanwhile, endogenous variables are variables that are the result of the existence of independent variables (exogenous). Similar to SEM, PLS consists of a structural model that describes the relationship between latent variables, a measurement component that shows the relationship between latent variables and their indicators, and weight relationships used to estimate case values for latent variables.

According to [18], operationalization is a process of changing abstract concepts into words that describe behaviour that can be assessed. Operationalization is the stage where the variables are converted into indicators that refer to empirical

measures and can be directly observed. Variable operationalization relates the differences between theoretical variables in the form of abstract terms with empirical variables that can be observed in real/sensory ways. In short, variable operationalization is an activity to change theoretical/concept variables into empirical/operational variables.

The operational variables in this study are understanding audit risk, auditor’s competency, and fuzzy logic analysis as independent variables. Meanwhile, the dependent variable is materiality level consideration. The operationalization is presented as follows:

Table 1 Operational Variables

| Variables | Dimensions | Indicators | References | |
|---------------------------------------|-----------------------------|--|---------------|--|
| Materiality Level Consideration (MLC) | Qualitative Considerations | The financial statement users | [19] | |
| | | The information needed by financial statement users | [20] | |
| | | The nature of misstatement | [4] | |
| | Quantitative Considerations | The percentage of monetary value from overall misstatement | | |
| | | Impact of Materiality | Audit process | |
| | Audit procedure | | | |
| Audit tenure | | | | |
| Audit cost | | | | |
| Audit risk | | | | |
| Understanding Audit Risk (UAR) | Ability and Knowledge | Audit evidence | | |
| | | Materiality consideration | [11] | |
| Auditor Competency (X2) | Competency | Auditor’s commitment | | |
| | | Audit risk components | [21] | |
| Professional reasoning | | [22] | | |
| Knowledge in audit | | [23] | | |
| Specific skills | | | | |
| Performance index | | | | |
| Independency | | [24] | | |
| Professionalism | | [4] | | |
| Fuzzy Logic Analysis (X3/Z) | Subjectivity Issue | Materiality consideration | [12] | |
| | | Audit experience | [12] | |
| | Audit Uncertainty | Audit evidence | | |
| | | Lack of data or evidence | [26] | |
| Data uncertainty | | | | |
| Ambiguity & Fuzziness | Ambiguity & Fuzziness | New findings during audit | | |
| | | Materiality changes during audit process | | |
| | | Data fuzziness | [13] | |
| | | Data ambiguity | [5] | |

p

Based on the Table 1 above, the indicators of each variable is used to determine whether there is a relationship between the independent and dependent variables.

4 RESEARCH RESULT

4.1 Overview of Respondents

We have distributed the questionnaire and gathered a total of one hundred participants that are willingly filled in our survey. The following table 2 is the distribution and overview of the respondents:

Table 2 Identity of Respondents

| Gender | Amount | Firm Size | Amount |
|---------------|--------|------------------|--------|
| Male | 45 | Big Four | 45 |
| Female | 55 | Non-Big Four | 55 |
| Age | Amount | Audit Experience | Amount |
| < 20 years | 2 | < 1 year | 45 |
| 20 – 25 years | 71 | 1 – 3 years | 30 |
| 25 – 30 years | 17 | 4 – 6 years | 12 |
| > 30 years | 10 | > 6 years | 13 |

Based on the Table 2 above, the distribution of gender and firm size is balanced enough. However, most of the respondents are below 25 years old and have less than 3 years of audit experience.

4.2 Indicator Validity Test

Each indicator is classified as good if it has a value of outer loadings greater than 0.7 [27]. However, according to [28], indicators that have outer loadings value of more than 0.5 can be classified as valid or capable of being used as research indicators. The Smart PLS version 3 application uses the benchmark according to [27], to classify whether the indicator crosses the lower limit of the value of the outer loading. However, it makes the indicator that has a value of outer loadings below 0.7 coloured red, which means invalid. Moreover, indicators that have outer loadings value of less than 0.4 must be removed from the model.

Table 3 Outer Loadings Value (Third Test)

| Indicators | Outer Loadings | Indicators | Outer Loadings | Indicators | Outer Loadings |
|------------|----------------|------------|----------------|------------|----------------|
| UAR1 | 0.687 | AC6 | 0.710 | MLC2 | 0.562 |
| UAR2 | 0.754 | FLA1 | 0.720 | MLC3 | 0.708 |
| UAR3 | 0.612 | FLA2 | 0.734 | MLC4 | 0.610 |
| UAR4 | 0.598 | FLA3 | 0.726 | MLC7 | 0.709 |
| AC1 | 0.760 | FLA4 | 0.678 | MLC8 | 0.701 |
| AC2 | 0.805 | FLA5 | 0.602 | MLC9 | 0.616 |
| AC3 | 0.711 | FLA6 | 0.591 | | |
| AC4 | 0.774 | FLA7 | 0.724 | | |
| AC5 | 0.767 | MLC1 | 0.512 | | |

Table 3 shows the conditions of the third test after removing the MLC6 indicator on the second test and without the MLC5 and MLC10 indicators which were eliminated in the first test. There have been several changes to the outer loadings value of each indicator, however all those indicators above are considered valid and could make it to the next test.

4.3 Reliability Test

This test is to determine whether the instrument or measuring instrument used produces the same calculation every time it is used. In other words, reliability measures the consistency of data collection. Consistency means that the information

obtained is reliable and in accordance with what actually happened.

In this research, data reliability was assessed using Cronbach's Alpha which measures the lower limit value of a construct and composite reliability that shows the actual value of the reliability of a construct [27]. Meanwhile, internal consistency reliability is a reliability test to determine the extent to which the indicators on the questionnaire measure the same thing. Internal consistency can be measured using Cronbach's Alpha. However, several studies have shown that composite reliability is a better aspect instead of internal consistency reliability [27], [17]. Composite reliability can accommodate the reliability of different indicators without reducing their ability in terms of sensitivity, unlike internal consistency reliability. The composite reliability value is calculated using Cronbach's Alpha with a result of 0.70 or more. According to [17], for exploratory research, Cronbach's Alpha's value of 0.60 or more is still acceptable.

Table 4 Cronbach's Alpha and Composite Reliability

| Variables | Cronbach's Alpha | Composite Reliability |
|-----------|------------------|-----------------------|
| UAR | 0.601 | 0.759 |
| AC | 0.849 | 0.888 |
| FLA | 0.811 | 0.860 |
| MLC | 0.754 | 0.824 |

Based on the Table 4 above, all independent and dependent variables have passed the reliability test using Cronbach's Alpha and composite reliability. However, variable UAR shows that it needs to be explored further.

4.4 Fornell-Larcker Criterion

This test wants to determine the correlation value of each variable. [27] in Fornell & Larcker (1981) explains that the AVE value of each variable must be greater than the highest R2 value with other latent variables.

Table 5 Fornell-Larcker Criterion

| | X1 | X2 | X3 | Y |
|----|-------|-------|-------|-------|
| X1 | 0.666 | | | |
| X2 | 0.618 | 0.755 | | |
| X3 | 0.560 | 0.518 | 0.685 | |
| Y | 0.612 | 0.664 | 0.601 | 0.635 |

Table 5 above shows that the correlation value of the same variable is higher than the value with other variables. Thus, it means that the constructs can provide more variance with its indicators than other constructs.

4.5 Coefficient of Determination Test (R²)

This test describes how big the effect of exogenous variables on endogenous variables. According to [29], the value of coefficient of determination (R²) is categorized as small if it is worth 2% or 0.02, moderate if it is worth 13% or 0.13, and large if it is worth 26% or 0.26.

Table 6 Coefficient of Determination

| Endogenous Variable | R ² | R ² Adjusted |
|---------------------|----------------|-------------------------|
| MLC | 0.557 | 0.543 |

Based on Table 6 above, the value of the Coefficient of Determination or R² is at 0.557 or 55.7%. In this case, the MLC variable acts as a pure endogenous variable. Then, R² Adjusted shows the number 0.543 or 54.3% which means that the exogenous variables UAR (X1), AC (X2), and FLA (X3) can strongly influence the pure endogenous MLC variables by 54.3%, and the remaining 45.7% is influenced by other variables that are not included in this study.

4.6 Effect Size Test

This test wants to show how much influence the independent variable has on the dependent variable. The f² value of 0.02 – 0.14 is categorized as having a weak influence, the f² value of 0.15 – 0.34 is categorized as having a moderate effect, and f² greater than 0.35 is categorized as having a strong influence [29].

Table 7 Effect Size (f²)

| Independent Variables | Dependent Variable (MLC) |
|-----------------------|--------------------------|
| UAR | 0.057 |
| AC | 0.192 |
| FLA | 0.114 |

Based on Table 7 above, the independent variables Understanding Audit Risk (UAR) and Fuzzy Logic Analysis (FLA) have a weak influence on the MLC dependent variable with values of 0.057 and 0.114, respectively. Meanwhile, the independent variable Auditor's Competency (AC) has a moderate effect on the MLC dependent variable with a value of 0.192.

4.7 Hypothesis Testing

Based on the results of the discussion above, the data obtained through the questionnaire can be declared valid and reliable after testing the structural model (inner model) and measurement model (outer model). That way, this research can be continued to the next stage, hypothesis T-Test. This test is carried out by analyzing the relationship between exogenous variables and endogenous variables using the bootstrapping method in the SmartPLS application. Hypothesis testing uses p-value and t-statistics as a comparison in determining the effect between variables.

This study uses an indication of the t-table value of 1.96 with a significance level of error of 5% or 0.05 (two-tailed) so that the hypothesis can be accepted. If the p-value is below 0.05, then H0 is rejected, which means that there is a significant effect between the independent variable and the dependent variable. Meanwhile, if the p-value is above 0.05, then H0 is accepted, which means that there is no significant effect between the independent variable and the dependent variable. The results of processing the bootstrapping model using SmartPLS can be seen in the following table and figure which produces the model and output path coefficient.

Table 8 Hypothesis Testing

| Path | T statistic | p-value sig. |
|----------|-------------|--------------|
| UAR →MLC | 2.441 | 0.015 |
| AC →MLC | 4.103 | 0.000 |
| FLA →MLC | 2.989 | 0.003 |

The auditor's knowledge of audit risk is proven to have a significant effect on the consideration of materiality of misstatements. The ability of the auditor to understand aspects of audit risk, including in analysing the conditions and situations of the client company, has an impact on the professional judgment of the auditor. The auditor may give an opinion that is not in accordance with the actual financial condition due to audit risk. However, if the auditor has a good understanding of audit risk, the auditor can consider the materiality level of high-risk accounts and can perform more in-depth audit procedures. This is in line with research conducted by [11].

Auditor competence is how the auditor applies the abilities and skills possessed in conducting audit activities. Auditor competence is proven to have a significant effect on determining the level of materiality. That way, auditors who have experience, independence, professionalism, and

high scepticism can carry out audit activities better, especially in considering the materiality level of misstatements because they require high professional judgment so that the opinions issued on financial statements are in accordance with actual conditions. This result is in line with the preliminary research conducted by [12].

The use of fuzzy logic analysis helps the auditor in determining the materiality of misstatements, especially in using qualitative considerations. In addition, the concept of fuzzy logic supports auditors to establish the level of materiality with known analyses such as the use of quantitative materiality considerations. The concepts contained in fuzzy logic reflect that the use of the theory can bridge the issue of subjectivity contained in the level of materiality of misstatements. This result is in line with the preliminary research conducted by [13].

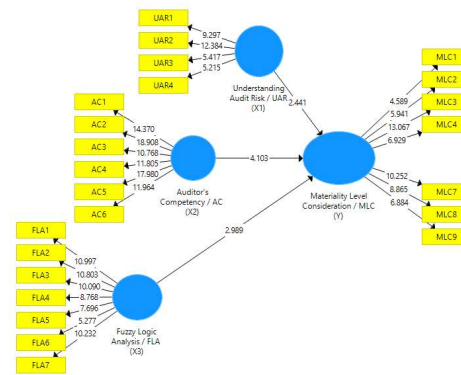


Figure 1 Structural Equation Modelling and Path Coefficient

5 CONCLUSION AND SUGGESTION

As previously explained, this study aims to determine whether the understanding of audit risk, auditor competence, and the use of fuzzy logic analysis can influence judgment in determining the level of materiality. Respondents who participated in this study have provided responses to the questionnaire questions and the data obtained have been processed and analyzed.

Concerning the problems identified, this study provides contribution of new finding about the impact of understanding audit risk and auditor competence on the determination of the materiality level of misstatements. Then, fraud or errors in financial statements can be caused by the escape of undetected misstatements from the qualitative consideration of the level of the materiality of financial statements. However, qualitative considerations in determining the materiality of

misstatements are important points in this study. To solve this problem, the use of fuzzy logic analysis can significantly affect the level of the materiality of misstatements. The concept of fuzzy logic can be used by auditors to improve quality and provide convenience for auditors in determining the level of audit materiality, especially on qualitative factors. The use of the fuzzy expert system conducted by [13] shows that the concept of fuzzy logic can help qualitative factors play as important a role as quantitative factors. This is due to the automation of the use of artificial intelligence to assist auditors in determining the level of materiality

Thus, the consideration of the materiality of misstatements is not limited to material or immaterial, but also emphasizes the impact of these decisions on the overall financial statements and users of financial statements. The decision on the materiality level is influenced by the auditor who plays an important role in the audit process. Understanding audit risk, auditor competence, and the use of fuzzy logic analysis can assist the auditor in making the right decision on the audit procedure to be performed.

The limitations of our study are the number of samples and the coverage area which includes Jakarta and Tangerang only. Prospects for further studies can use this research as previous research by increasing the number of samples and expanding the coverage area to auditors

Further researchers can use this research as a preliminary and comparison study by having an extensive research sample with more experienced auditors. Hence, the results of this research can also be a foundation for enrichment in auditing, information system and computer science.

REFERENCES:

- [1] S. H. Winarno, "Penilaian Kinerja Keuangan Perusahaan Melalui Analisis Profitabilitas," *Jurnal Moneter*, vol. IV, pp. 106-112, 2017.
- [2] M. R. Hutauruk, *Akuntansi Perusahaan Jasa Aplikasi Program Zahir*, Jakarta Barat: Indeks, 2017.
- [3] W. Zhou and G. Kapoor, "Detecting evolutionary financial statement fraud," *Decision support systems*, vol. 50, no. 3, pp. 570-575, 2011.
- [4] K. M. Johnstone, A. A. Gramling and L. E. Rittenberg, *Auditing: A risk based-approach to conducting a quality audit*, 10, Ed., Cengage Learning, 2016.
- [5] R. E. Bellman and L. A. Zadeh, "Decision-Making in a Fuzzy Environment," *Management Science*, vol. 17, no. 4, pp. B-141--B-164, 1970.
- [6] J. L. Colbert and J. J. S. Jahera, "The Role of The Audit and Agency Theory," *Journal of Applied Business Research*, vol. 4, no. 2, pp. 7-12, 1988.
- [7] D. G. Mihret, "How can we explain internal auditing? The inadequacy of agency theory and a labor process alternative," *Critical Perspectives on Accounting*, vol. 25, no. 8, pp. 771-782, 2014.
- [8] M. C. Jensen and W. H. Meckling, ". Theory of the firm: managerial behavior, agency costs and ownership structure.," *Journal of Financial Economics*, vol. 3, no. 4, pp. 305-360, 1976.
- [9] M. B. Adams, "Agency Theory and the Internal Audit," *Managerial Auditing Journal*, vol. 9, no. 8, pp. 8-12, 1994.
- [10] R. A. Lambert, "Agency Theory and Management Accounting," *Handbooks of Management Accounting Research*, pp. 247-268, 2006.
- [11] I. S. Pertiwi and H. Herawati, "Pengaruh Risiko Audit Terhadap Pertimbangan Tingkat Materialitas," *Sistem Informasi, Keuangan, Auditing, dan Perpajakan*, vol. 2, no. 1, pp. 14-19, 2017.
- [12] O. Furiady and R. Kurnia, "The Effect of Work Experiences, Competency, Motivation, Accountability, and Objectivity towards Audit Quality," *Social and Behavioral Sciences*, vol. 211, pp. 328-335, 2015.
- [13] C. L. Comunale and T. R. Sexton, "A Fuzzy Logic Approach to Assessing Materiality," *Journal of Emerging Technologies in Accounting*, vol. 2, no. 1, pp. 1-15, 2005.
- [14] E. Pierce, "Designing and Conducting Quantitative Research Studies," in *Quantitative Health Research: Issues and Methods*, Maidenhead, Open University Press, 2013, pp. 131-150.
- [15] M. Abdullah, *Metodologi Penelitian Kuantitatif*, Yogyakarta: Aswaja Pressindo, 2015, p. 226.
- [16] A. Latief, "Analisis Pengaruh Produk, Harga, Lokasi dan Promosi terhadap Minat Beli Konsumen pada Warung Wedang Jahe," *Jurnal Manajemen dan Keuangan*, vol. 7, no. 1, pp. 90-99, 2018.

- [17] K. Kwong and K. Wong, "Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS," *Marketing Bulletin*, pp. 24-56, 2013.
- [18] W. Wardhono, "Pengukuran Variabel," *Bina Ekonomi*, vol. 9, no. 1, pp. 12-28, 2005.
- [19] IAASB, "Materiality in Planning and Performing an Audit," *Proposed International Standard on Auditing 320 (Revised)*, pp. 1097-1104, May 2006.
- [20] ISA 320, "Audit Materiality," 2004.
- [21] ISA 400, "Risk Assessment and Internal Control," 2004.
- [22] A. Joldos, I. Stanciu and G. Grejdan, "Pillars of the audit activity: materiality and audit risk," *OF THE UNIVERSITY OF PETROȘANI~ ECONOMICS~*, vol. 10, no. 2, pp. 225-238, 2010.
- [23] I. Sukriah and B. Inapty, "Pengaruh pengalaman kerja, independensi, obyektifitas, integritas dan kompetensi terhadap kualitas hasil pemeriksaan," *Simposium Nasional Akuntansi*, vol. 12, no. 3-9, 2009.
- [24] G. Hudiwinarsih, "Auditors' Experience, Competency, and Their Independency as the Influential Factors In Professionalism," *Journal of Economics, Business, and Accountancy Ventura*, vol. 13, no. 3, pp. 253-264, 2010.
- [25] S.-I. Chang, C.-F. Tsai and C.-L. Hwang, "The Development of Audit Detection Risk Assessment System: Using the Fuzzy Theory and Audit Risk Model," *Expert Systems with Applications*, vol. 35, no. 3, pp. 1053-1067, 2008.
- [26] G. T. Friedlob and L. F. Schleifer, "Fuzzy Logic: Application for Audit Risk and Uncertainty," *Managerial Auditing Journal*, vol. 14, no. 3, pp. 127-137, 1999.
- [27] J. F. Hair , M. Sarstedt, L. Hopkins and V. G. Kuppelwieser, "Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research.," *European Business Review*, pp. 106-121, 2014.
- [28] I. Ghozali, *Structural Equation Model (SmartPLS) versi 3.0*, Semarang: Badan Penerbit Universitas Diponegoro, 2006.
- [29] C. M. Ringle, D. d. Silva and D. Bido, "Structural Equation Modeling with the SmartPLS," *Brazilian Journal of Marketing*, vol. 13, no. 2, pp. 56-73, 2014.