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Semiotics of audit quality: a meta-analysis perspective

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Abstract
Research aims: The purpose of this study is to identify the semiotics of the relationship between audit fees and audit quality**.**
Design/Methodology/Approach: A quantitative method using meta-data analysis was employed with ten selected research articles from 113 sample articles.
Research findings: The results demonstrated that a semiotic analysis of audit quality with a meta-analysis approach has been carried out, revealing that the audit fee variable had a relationship with audit quality and was strengthened by the size variable. The existing data heterogeneity problem was reduced after the size variable was included in the meta-analysis regression analysis, so it was reduced even though it had not been significantly reduced.
Theoretical contribution/Originality: The semiotics of the relationship between audit fees and audit quality exist.
Practitioner/Policy implication: This study contributes to paying attention to critical factors in improving audit quality.
Research limitation/Implication: This study's limitations are that it could not reach the 95% data confidence coefficient level since the data used were still not much, and the size variable could not reduce data heterogeneity to the maximum.
Keywords: Audit Quality; Semiotics; Meta-analysis; Size, Audit fee

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Introduction

The product of a presentation of financial statements is a financial report that has been examined and has received the title of being accountable. This accountability can be measured to what extent the presentation of these financial statements can be called a quality audit. In semiotics, the accountability of a financial report is highly dependent on the audit results. The indication can be seen in the quality of the audit. Audit quality has been defined in various ways. Watkins et al. (2004) mentioned several definitions of audit quality. In the practical literature, audit quality is how well the audit conforms to auditing standards. On the other hand, accounting researchers identify various dimensions of audit quality. These different dimensions also make the definition of audit quality different. First, DeAngelo (1981) emphasized audit quality as a market-value probability that the financial statements contain material errors, and the auditor will check and provide a report on these material errors.

Second, Lee et al. (1999) stated that audit quality is the probability that the auditor will not report an audit report with an unqualified opinion for financial statements that contain material errors. Third, audit quality is measured by the accuracy of the information reported by the auditor (Beatty, 1989; Davidson & Neu, 1993; Krinsky & Rotenberg, 1989; Titman & Trueman, 1986). Moreover, the last definition of Wallace (1980) and Wallace (2004) states that audit quality is determined by the audit's ability to reduce noise and bias and increase the purity (fineness) of accounting data.

This vital point regarding the definition of audit quality, according to Widiastuty & Febrianto (2010), is measured by two factors: audits carried out by competent people and independent people. Competent auditors have technological capabilities, understand and carry out correct audit procedures, understand and use correct sampling methods, and others (Widiastuty & Febrianto, 2010). Conversely, an independent auditor is an auditor who, if he finds a violation, will independently report the violation. The probability that the auditor will report a violation of the auditor's independence depends on their competence level (Widiastuty & Febrianto, 2010).

Further, DeAngelo (1981) argues that large accounting firms only possess these qualities (the Big 8). This opinion is supported by Lee (1993), who explains that if the auditor and the client have a relatively small size, there is a high probability that the auditor's income will depend on the audit fee paid by the client. Therefore, this small auditor will tend not to be independent of his client. On the other hand, at the other extreme, if the auditor is significant, he tends to be more independent of his clients, whether the client is large or small. Thus, the size of this accounting firm is widely accepted by accounting researchers and is widely used to measure audit quality (Widiastuty & Febrianto, 2010).

Audit quality, in this case, also intersects with audit fees. In empirical research, paying fees to auditors impacts audit quality in two ways. The payment of an extensive audit fee may increase the auditor's effort, which simultaneously increases audit quality, thereby increasing audit quality. Alternatively, the hefty fees paid to auditors, particularly those related to non-audit services, make auditors more economically dependent on their clients. This financial dependence can lead to a relationship where the auditor becomes reluctant to ask the right questions during the audit for fear of losing a lucrative fee (Hoitash et al., 2007).

For that reason, this study wants to examine the relationship between audit fees and audit quality using a meta-analysis approach. Meta-analysis was used to analyze empirical studies that previous studies have conducted, quantitative research results, and research results in a form that could be compared, such as the mean, correlation coefficients, and odds ratio. The results of this study were then used as material to calculate the effect size, which was employed to compile aggregates. Meta-analysis was also used to test comparable constructs and relationships. This meta-analysis is a research method to combine studies where the effect size can be measured (Retnawati et al., 2018). In

addition, this study also utilized the size variable as a coefficient. The size variable was used because audit quality directly relates to company size. Companies with large sizes will lose a lot of client-specific quasi-economic rents if the loss of reputation occurs because of the large number of clients. Hence, to avoid loss of reputation, large companies are willing to provide more significant incentives to obtain audit quality (DeAngelo, 1981; Francis, 1984).

Additionally, meta-analysis for a study is essential since it is a statistical method combining and synthesizing several studies and integrating the results. Meta-analysis increases sample size and, in turn, the power to study the effect of interest by combining primary studies and providing precise and precise effect estimates. Data synthesized from meta-analyses is usually more helpful than results from narrative reviews. In a meta-analysis, decisions are transparent, and statistical analysis produces objectively integrated evidence measures (Lee, 2019). Furthermore, to obtain more reliable results, meta-analysis is mainly carried out in randomized controlled trials (RCTs), which have a high level of evidence (Ahn & Kang, 2018). According to Hay (2018), which is corroborated by Velte (2018), in recent times, there has been considerable potential for auditing researchers to use meta-analysis in auditing research, as meta-analysis makes a valuable contribution to policy, practice, and audit regulations, as well as scientific understanding in auditing.

Meta-analysis is a statistical technique that allows research to overcome the lack of narrative aspects of empirical reviews (Ahmed et al., 2013). According to Lipsey & Wilson (2001), a significant contribution from meta-analysis can be helpful for general knowledge development within the framework for all parts of research on a particular topic. The meta-analysis approach, so far, still revolves around the impact of IFRS adoption (Ahmed et al., 2013). In addition, a meta-analysis approach is used to describe the determinants of modified audit opinion decisions (Habib, 2013). Meta-analysis is also used by Griffith et al. (2018) to test the elaboration likelihood model (ELM) as a meta-theoretical framework that helps understand collective findings in auditor judgment and decision-making. Also, Guilbault et al. (2004) and Christensen-Szalanski and Willham (1991) used meta-analysis to examine hindsight bias in decision-making. Trotman and Wood (1991) also employed meta-analysis to test judgments on internal control. Furthermore, Smith et al. (2023) used a meta-analysis to examine the influence of deontological and teleological evaluations on ethical judgments and intentions.

Research on audit quality has been conducted by Arianiestasya et al. (2017), which produced state-of-the-art explanations and audit quality measurements from 1981 to 2014. Other research on audit quality has also been carried out by Hwang & Lin (2008), which uncovered that out of 27 research results, 11 studies found a non-significant relationship. This study has differences in the unit of analysis and the type of research conducted, namely by using the unit of analysis of audit quality, which is correlated with audit fees, mediated by the size variable. The data were obtained from the results of

previous studies regarding audit quality, and audit quality measurements were used as variables in this study, namely audit fees and size variables. In this study, audit quality was measured by the audit office's size based on the auditor's competence and independence (DeAngelo, 1981).

The difference in this study also lies in the research objectives, namely mapping previous research on audit quality, audit fees, and public accounting firm size. Therefore, this study assumes that few studies on audit fees and audit quality use meta-analysis. In addition, the novelty of this study is to look at the audit quality variable in more detail; the size of a city-based audit engagement office could be a more crucial determinant of audit quality (and thus audit fees) than the size of a national level audit firm because the city-based office is a semi-autonomous unit within an audit firm with its client base (Choi et al., 2010). Consequently, the current paper seeks to contribute to the existing literature. First, it supports decision-makers in public accounting firms to consider the role of auditor fees and the size of public accounting firms. Second, it provides insight into the need for synergy between audit fees, size, and quality.

Literature Review

Meta-analytic reviews in auditing have explored various matters, including the determinants of audit fees and the relationship between audit quality and accounting quality (Khlif & Chalmers, 2015). Thus, the theory used as a guide in this study is the economic bonding theory. According to Gandía & Huguet (2021), research related to the economic bonding theory proves that audit quality decreases when abnormal costs are higher. Using an economic framework shows that determining audit fees is more likely to be subjective, which follows the current situation and conditions (Ng et al., 2018). Furthermore, the results prove that audit quality decreases when negative abnormal costs are higher, which can be attributed to client bargaining power. There is a bond between clients and auditors when clients provide more significant compensation related to managerial policies in financial reporting (Choi et al., 2010).

On the other hand, audit quality broadly refers to the quality of monitoring and verification services provided by external auditors engaged by client companies (Kalia et al., 2023). However, there are signals of threats to auditors' business relationships with specific clients and how auditors respond to competitive markets (Buuren & Majoor, 2015), although in Okoye & Obasi's study (2012), the economic bond theory was unable to answer in deepening the trend of audit firms. In this context, the relevance of the size variable is because it is related to reputation. If reputation is not to be lost, high audit fees are needed so that audit quality can be maintained (DeAngelo, 1981; Francis, 1984).

Several studies have widely investigated the relationship between audit fees and audit quality and have been published in reputable international journals (Ayoola, 2022; Cahan & Sun, 2015; Campa, 2013; J. Choi & Kim, 2010; Deis & Giroux, 1996; Hoitash et al., 2007; Jackson et al., 2008; Jung et al., 2016; Qawqzeh et al., 2021; Salehi et al., 2019). These

studies also link the relationship between audit quality, audit fees, and the public accounting firm size variable. In this context, size is a variable whose impact may be explained by the agency concept approach (Dragomir & Dumitru, 2023). It is what this study captures as semiotics. The concept of semiotics in this research is that semiotics can provide a helpful lens through which to view metadata. It is crucial to determine what, at the semiological level, the specific function of the metadata is. In other words, what is the meaning of the choice of semantic units used to populate the schemata of understanding 'consistency' or 'accuracy' in the recording? (Radio, n.d.).

Research Method

The collection stage used the Publish or Perish search engine (Yusuf et al., 2023). The type of research employed in this research was descriptive statistical research. Calculated descriptive statistics were used for observations and measurements (Cresswell, 2009, 2014). In another view, descriptive statistical research aims to explain something through a previous study (Arianiestasya et al., 2017). Hence, later, this study explains the results of research based on previous article data using semiotics in the form of variable audit fees, audit quality, and audit size. This study used scientific articles from international-based journal articles obtained by accessing Scopus from 1990 to 2022, or for 32 years.

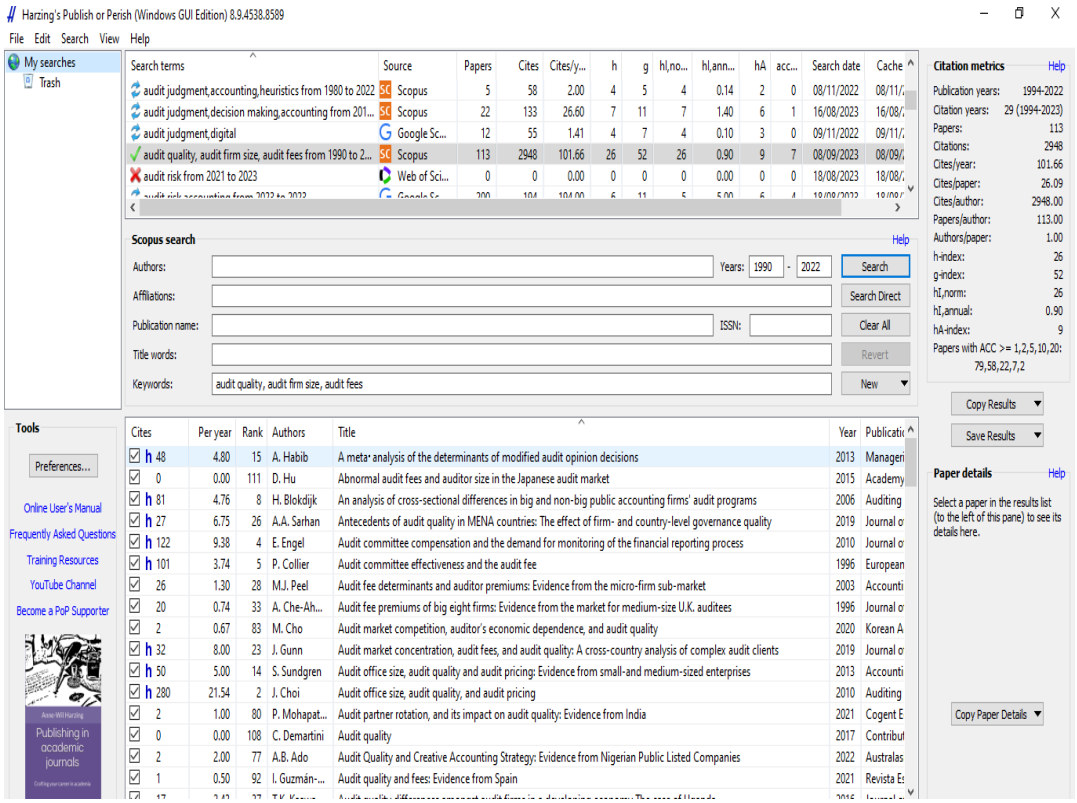

Figure 1 Search results using the Publish or Perish application tools, 2023

The sample selection criteria can be seen in Table 1. From Table 1, it can be explained that over 32 years, 113 articles were found that met the criteria to be the initial sample, and then after selection, ten articles were selected. Literature selection was carried out in the preparatory stage of data collection and continued with data collection as follows, namely: 1) the use of keywords: the keywords used by researchers to conduct searches were related to "audit quality," "audit fees," and "audit firm size"; 2) Exploration: Exploration conducted by researchers was the selection of titles, abstracts, and keywords in articles obtained from search results based on previously defined eligibility criteria.

Table 1 Sample Choices

No	Sample Choices	
	Criteria	**Number of samples**
1	Initial sample	113
2	Incomplete	90
3	No correlation data	13
4	Final sample	10

Based on Figure 1, in the search results from the keywords determined in the first stage, the researchers got as many as 113 articles. From these 113 articles, further identification of articles that did not match the title, abstract, or full text was done, and finally, the researchers got about 90 articles to be processed again. Furthermore, exclusion was carried out based on the criteria of journals published within the period (1990-2022) so that 65 articles were obtained; 3) Complete or partial reading: In this process, the researchers did complete (full text) or partial (not full text) reading activities of articles that had not been eliminated in the previous stage to determine whether the article should be included in the subsequent study according to the eligibility criteria. After 65 articles were screened by looking at the entire text, 43 were obtained, which would be processed again; 4) In reviewing the selected articles and then excluding irrelevant articles that did not answer the research questions and were unsuitable for review, as many as 23 articles were eliminated. Based on the inclusion criteria, the final number of articles that met the critical appraisal requirements and were suitable for review was ten; 5) Literature criteria: Inclusion criteria in this study consisted of a) an internationally reputable journal indexed in Scopus published within 32 years (1990-2022), b) articles on the topic of audit quality, audit fees, and audit-firm size, c) full text and open access manuscripts, and d) using English.

The data analysis in this study was based on Hunter & Schmidt (2004), where various effect sizes were used, including Cohen's d, odds ratio, Glass's g, log-odds, and log-risk ratio (Cooper & Hedges, 2019; Stanley & Doucouliagos, 2012).

Moreover, according to Page et al. (2021), journal articles and publishers can impose word limits, section limits, and limits on the number of tables and images allowed in the main report. In such cases, if the relevant information for some items already appears in a publicly accessible review protocol, referring to that protocol will suffice. It is also reinforced by Anwar (2005), who emphasized that if there are only a few subgroups, the results of the merging of the subgroups can be included in the overall result diagram.

However, if there are several subgroups, the merging results are described in a separate diagram. The article can be seen in Table 2.

Table 2 Selected Sample Data

Year	Selected sample data		
	Researcher	**Name of Publication Journal**	**Size of Public Accountant Office**
1996	Donald R. Deis, Jr. and Gary Giroux	Journal of Accounting and Public Policy	Local and regional public accounting firms of independent school districts (ISDs) in Texas
2007	Andrew B. Jackson et al.	Managerial Auditing Journal	Public accounting firms in Australia
2010	Jong Hag Choi et al.	Auditing: A Journal of Practice & Theory	Big Four public accounting firms in the Compustat Industrial annual file
2013	Domenico Campa	Managerial Auditing Journal	Big Four public accounting firms
2014	Steven F. Cahan & Jerry Sun	Journal of Accounting, Auditing & Finance	Localization of Big Four public accounting firms' offices in China
2015	Soo-Jung Jung et al.	International Journal of Accounting and Information Management	Big Four public accounting firms in the Compustat Industrial annual file in Korea
2018	Mahdi Salehi et al.	Journal of Financial Reporting and Accounting	Big Four public accounting firms in the Compustat Industrial annual file in Iran
2020	Curtis M. Hall et al.	Managerial Auditing Journal	Big Four public accounting firms and industry-expert auditors
2020	Hamza Kamel Qawqzeh et al	Journal of Financial Reporting and Accounting	Big Four public accounting firms in the Compustat Industrial annual file in Jordan
2022	Tajudeen John Ayoola	Journal of Financial Reporting and Accounting	Public accounting firms in Nigeria

From Table 2, it can be explained that of the ten selected articles, the research results were dominated by publications in the Managerial Auditing Journal with three articles, and the Journal of Financial Reporting and Accounting with three articles. The rest were published in other reputable international journals.

Research on the relationship between audit quality, audit fees, and public accounting firm size can significantly impact the financial, auditing, and regulatory contexts. Thus, the problem formulation that can be proposed is: What is the relationship between audit quality, audit fees, and public accounting firm size?

Results and Discussion

Data analysis used meta-analysis, with the results as shown in Table 3. The results of the meta-analysis are presented in Figure 2, showing the odds ratio of each study (black box) with its confidence interval (horizontal line). The vertical line illustrates the odds ratio of 1, meaning no difference exists between the Favors A and B groups. The combined odds ratio is depicted as a diamond. The chart is constructed using logarithmic odds ratios for the confidence interval to be symmetrical around the odds ratio. In this result, eight out of ten articles whose combined confidence intervals intersected the vertical line created through the combined results indicate that the combined studies were homogeneous. Meanwhile, two studies did not cross the vertical line, i.e., the articles by Campa (2013) and Deis (1996).

Table 3 Data of Meta-Analysis

Year	Data of Meta-Analysis							
	Research	**Correlation**	**Sample Size**	**Effect Direction**	**Std Err**	**Fisher's Z**	**Std Err**	**Size**
1996	Deis and Giroux	0.27	232	auto	0.061	0.277	0.066	0.15
2007	Jackson et al.	-0.0522	3500	auto	0.017	-0.052	0.017	-0.2112
2010	Choi et al	-0.196	19.499	auto	0.237	-0.199	0.246	-0.062
2013	Domenico Campa	0.590	2362	auto	0.013	0.678	0.021	0.609
2014	Cahan & Sun	0.04	1917	auto	0.023	0.040	0.023	0.08
2015	Jung et al	0.024	10856	auto	0.010	0.024	0.010	0.037
2018	Salehi et al.	0.017	630	auto	0.040	0.017	0.040	0.068
2020	Hall et al	0.46	1831	auto	0.018	0.497	0.023	0.47
2020	Hamza K Qawqzeh et al	0.544	94	auto	0.074	0.610	0.105	0.710
2022	Tajudeen J Ayoola	0.020	23	auto	0.224	0.020	0.224	-0.145

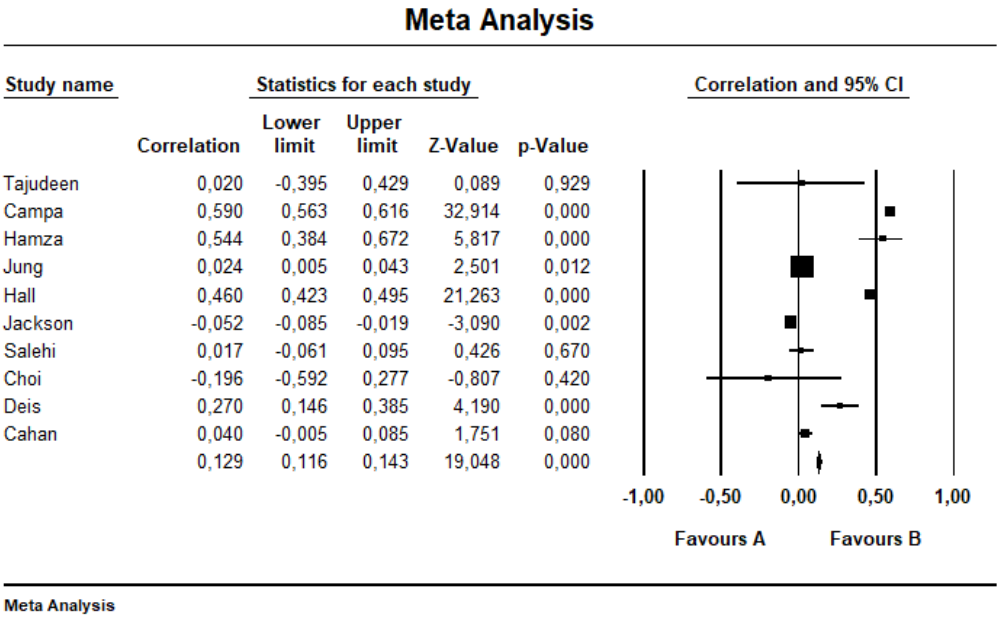

Figure 2 The final result of the meta-analysis

From Figure 3, it can be seen that the results of the fixed model showed that the p-value on the test of null (2-tail) had a value of 0.000 (significant) at the 1% level, which means that the correlation between the x and y variables was accepted. However, it revealed an I squared value of 99.27%, which denotes that the data's heterogeneity level was relatively high, requiring a variable covariance (moderation) in the model test to reduce the level of heterogeneity.

Model		Effect size and 95% interval			Test of null (2-Tail)		Heterogeneity				Tau-squared			
Model	Number Studies	Point estimate	Lower limit	Upper limit	Z-value	P-value	Q-value	df (Q)	P-value	I-squared	Tau Squared	Standard Error	Variance	Tau
Fixed	10	0,129	0,116	0,143	19,048	0,000	1243,682	9	0,000	99,276	0,084	0,063	0,004	0,289
Random	10	0,208	0,022	0,380	2,186	0,029								

Figure 3 Model fixed of Meta-Analysis

Furthermore, meta-regression two was performed to reduce the effect of heterogeneity in processing the data, and the following results were obtained:

Main results for Model 1, Random effects (MM), Z-Distribution, Fisher's Z

Covariate	Coefficient	Standard Error	95% Lower	95% Upper	Z-value	2-sided P-value
Intercept	0,0438	0,0395	-0,0336	0,1212	1,11	0,2673
size	0,9227	0,1135	0,7003	1,1450	8,13	0,0000

Statistics for Model 1

Test of the model: Simultaneous test that all coefficients (excluding intercept) are zero
Q = 66,13, df = 1, p = 0,0000
Goodness of fit: Test that unexplained variance is zero
Tau^2 = 0,0074, Tau = 0,0857, I^2 = 91,64%, Q = 95,65, df = 8, p = 0,0000

Comparison of Model 1 with the null model

Total between-study variance (intercept only)
Tau^2 = 0,0836, Tau = 0,2892, I^2 = 99,28%, Q = 1243,68, df = 9, p = 0,0000
Proportion of total between-study variance explained by Model 1
R^2 analog = 0,91

Number of studies in the analysis 10

Figure 4 Result of model processing 1

From the results of Figure 4, it can be seen that the correlation probability remained 0.000 (significant at the 1% level), or in other words, the correlation value remained consistent in the X and Y relationship, and the 1% value decreased to 91.64%, indicating that size gave the ability to reduce data heterogeneity. Next, the coefficient of determination showed the number 0.91, implying that the entire sample could explain the dependent variable and the model up to 91%.

From Figure 5, it can be seen that the distribution of the data was still uneven. Nevertheless, no bias (overestimation) is visible from the Figure 5 because no data points overlapped. Thus, the data processed using meta-analysis has been proven to rely on the semiotics of the audit quality variable alone. The researchers had tried to explore as many as 113 articles in reputable international journals for audit quality semiotics but could only get ten selected articles. Then, after processing the data using a meta-analysis approach, the results of two studies were obtained, which showed different results compared to other studies, namely the Campa (2013) and Deis (1996) studies. Processing results also revealed that the entire sample could explain the dependent variable and the model by up to 91%. The distribution of the funnel plot can be seen in the Figure 5.

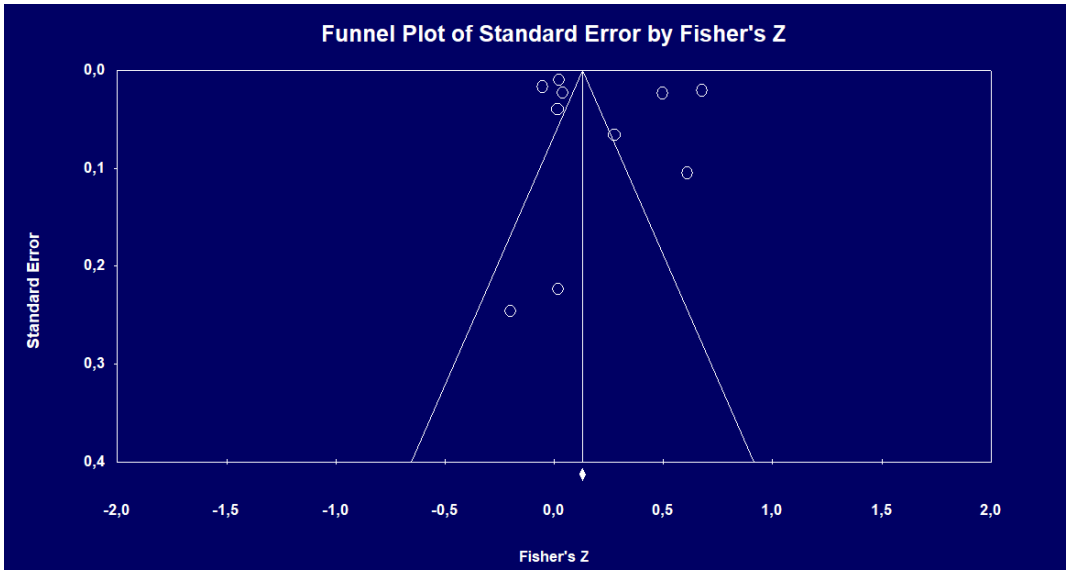

Figure 5 Distribution funnel plots

Based on the research results, it can be elucidated that the output of data processing using the theoretical approach is that audit quality decreased when abnormal costs were higher. Furthermore, the research results also prove that audit quality decreased when negative abnormal costs were higher, which could be attributed to client bargaining power. There is a bond between the client and the auditor when the client provides more rewards related to managerial policies in financial reporting (Choi et al., 2010) (Choi et al., 2010). The economic implications confirm that it is necessary to improve audit quality so that it will impact increasing audit fees and the size of public accounting firms. Payment of fees to auditors can also affect audit quality in two ways. The payment of hefty audit fees may increase the effort of auditors, which simultaneously also increases audit quality, thereby improving audit quality. Alternatively, large fees paid to auditors, especially those related to non-audit services, make auditors more economically dependent on their clients. Such financial dependence may lead to a relationship where auditors become reluctant to make appropriate inquiries during the audit for fear of losing highly lucrative fees (Hoitash et al., 2007).

Conclusion

The semiotics of audit quality results with the meta-analysis approach uncovered that the variable of audit fee was related to audit quality by moderating the size variable. After the size variable was added to the meta-analytical regression analysis, the heterogeneity problem became less obvious, though not dramatically lessened. The limitations of this study were not achieving a data confidence level of 95% because the data used were still insufficient, and the size variable could not reduce the heterogeneity of the data maximally. Overall, the research results above showed that the audit fee variable had a relationship with the audit quality variable and was not supported by the other variable,

namely size. The drawback of this study, which needs to be corrected in the future, is that there was bias in sampling and publication, so the non-uniformity of each study caused bias in sampling; in the future, it needs to be minimized (Retnawati et al., 2018). Future studies should also include more research subject data since the more subject data to be studied, the stronger the results will be. In addition, the variables used can be developed other than audit quality, such as audit opinion, delay, fraud, and others.

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