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Auditors Role in Ensuring Tax Compliance: Insights into Tax Audits and Regulatory Adherence

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ABSTRACT

Objective: The extent of tax compliance by using audit quality, type of audit, technology, and tax compliance complexity, as well as the numbers of tax audit are the objectives of the study in addition to the role of auditors in this regard.

Methods: We designed a structured survey that was administered to auditors and tax officials to collect data on their audit practices, compliance behaviors and perceptions of regulatory complexity. Hypothesis testing was performed on the data by using multiple regression analysis.

Results: The findings demonstrate that audit quality and the use of external auditor positively affect taxpayer adherence. Moreover, tax regulatory complexity was discovered to harmfully moderate the association between audit effectiveness and tax compliance. This emphasis on audit technology dramatically improved the audit process and provided favorable compliance results. Furthermore, entities monitored regularly complied at significantly higher rates than those audited irregularly.

Novelty: This study adds to the literature by combining the theories of modern audit technologies and regulatory complexity in an investigation of tax compliance. This also advance our understanding of external vs internal auditor effects to compliance levels, especially for a developing country taxation system like Indonesia.

Research Implications: The study highlights the need for tax regulators to reduce tax complexities and invest in innovative tax audit technologies in a bid to improve tax compliance. Regular audits and particularly the introduction of external audits could further help to bolster the tax compliance framework, the study added. Emerging technologies such as Artificial Intelligence (AI) and blockchain can transform tax audits and compliance monitoring, which could be a topic for further research.



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1. Introduction

Embasing tax compliance in the developing country, in where is a non-payment of taxes a widespread phenomenon, becomes still harder when delivering theory of the Law of Tax General due to the everchange that may be happen in economy. Furthermore, recent media highlights have pointed out that Indonesia still needs to strive in the area of compliance, with a significant gap between tax revenue and realized revenue (ElMassah & Mohieldin, 2020; Schoneveld et al., 2019) for corporate taxpayers. The complexity of regulations is increasing and the prevalence of tax evasion is growing, leading to increased scrutiny of the role of auditors in complying with tax law (Jones et al., 2018; Mawani & Trivedi, 2021). Additionally, the digitalization of audit processes, particularly through innovative technologies like artificial intelligence and blockchain, is transforming the tax audit

process with new opportunities and challenges (Han et al., 2023; Vitali & Giuliani, 2024). Proven audit practices are able to resolve tax noncompliance or establish compliance adequacy in various scenarios (Enachescu et al., 2019) and therefore become a very influential global issue. But Indonesia's dynamic and unique business environment requires tailored strategies to close specific compliance gaps.

Indonesia has a lower tax compliance number, in which the limited resources to run the audit and the audit quality per region is different. Though the company has changed its regulations, many companies continue to exploit loopholes in the regulations, which undermines efforts to comply with tax regulations (Anesa et al., 2019; Fleming-Milici & Harris, 2020). SMEs, which plays as an essential part in Indonesia's economy, are broadly unaware or resourceful in upholding tax compliance (Khan et al., 2020; Liza et al., 2024). In addition, trust in the audit process is



still a big issue because there are concerns regarding auditor independence and conflicts of interest (Le et al., 2022; Meuwissen & Quick, 2019). Research to date has focused on audit mechanisms, especially external audits, such as that implemented by China. Extern audit experience, or extern audit compliance in China, is viewed to raise compliance. Previous studies indicate that external audits can boost compliance when designed carefully. Nevertheless, isso in practice does not happen due to logistic and systemic constraints that generate perverse incentive (Juvandes, 2024). These differences emphasise the need for more in-depth understanding of auditors' role in monitoring compliance, especially within the distinct economic and regulatory environment of Indonesia (Dharmayanti et al., 2023).

The study is grounded in agency theory as it relates to principals and agents, the former being tax authorities and the latter being taxpayers. According to agency theory, differing interests between these groups may lead to non-compliance, and thus strong oversight tools are required, audits (Jensen & Meckling, 2019; Maestrini et al., 2018). Deterrence theory also plays an important role in explaining the function of audits in deterring tax avoidance, as it amplifies the perceived risk of noncompliance (Kasper & Rablen, 2023; Kovermann & Velte, 2019). Audits effectively reduces tax evasion when penalties and processes are stricter and transparent Battaglini et al. (2024), Benkraiem et al. (2021), supported by empirical evidence. Moreover, the use of technology in auditing is consistent with the theory of planned behavior, which explains how perceived ease of compliance and trust will shape taxpayer behavior (Kasper & Alm, 2022; Tourek, 2022).

Indonesia has long been plagued by low tax compliance, which significantly impedes the country's development goals thus the urgency of this research. Previous research has produced conflicting evidence at best on the relationship between audit quality and tax compliance (Benkraiem et al., 2021; Kasper & Rablen, 2023). In developed nations, for example, direct effects of regular audits were related to improved compliance (Kurauone et al., 2021; Mertzanis et al., 2020). On the contrary, in the contexts of developing economies, such as in Indonesia, studies indicate that audit effectiveness is frequently undermined by corruption and resource limitations (Dávid-Barrett & Fazekas, 2020; Gani, 2021; Gans-Morse et al., 2018; Rahmania et al., 2024). New innovations like these that use digital audits seem promising but have not been thoroughly investigated within Indonesia (Adam & Fazekas, 2021; Barroso & Laborda, 2022). This research aims to fill these void by examining how auditors, with the support of advanced tools and methodologies, can improve

tax compliance in spite of systemic challenges. This uniquely makes the focus of the paper, is internal auditors vs. external auditors by comparing their roles, best practices, and areas for improvement.

This research inspects how auditors influence tax compliance accountability in Indonesia; therefor the main focus of the study will be on the internal and external aspects of audit. This study aims to analyze which components affect audit quality, how these components affect the behaviour of taxpayers, and produce recommendations that can help in designing a better audit quality model in Indonesia, which in turn improves compliance.

2. Theoretical framework and development

2.1 Critical Theory

Critical theory is an analytical framework in which one can analyze power dynamics and systemic inequities in all institutions, including in the tax system. Based on the Frankfurt School, this theory underscores the influence of social structures in molding compliance behaviors and the operationalization of regulatory measures (Habermas, 1984). An emphasis on critical theory in accounting can broaden the context for a case study of tax audits, illustrating how disparities in access to resources, information or political power influence taxpayer compliance and audit effectiveness. For example, access to legal or financial resources has big implications when it comes to market access for small, marginalized businesses in developing economies (Fuchs & Lederer 2020). Corruption has long been considered a moral and social issue, but more recently critical theory has been applied to accounting and auditing (Hopwood et al., 2004); nevertheless, transparency and accountability in other areas has been shown to let the light of understanding in and mitigate corruption, and build trust in audit processes (Sikka, 2021). Motivated by this view, we can start turning our minds to how audit practices might systematically be reconstituted to be more productive in terms of social equity and tax compliance across the variations in socio-ecological context (Stewart & Chapman, 2022).

2.2 The impact of audit quality on taxpayer compliance

The quality of the audit is an important factor influencing compliance due to taxpayers have more confidence in high quality audit and audit reduces information asymmetry and makes cheating hardly work (Mansour, 2023). That is audit quality is defined by independence, expertise and rigor of the audit process which enhance the reliability and accuracy of audit

findings (DeFond & Zhang, 2019). Audits of high quality deliver unambiguous recommendations and solid evaluations, thus reducing chances for avoidance and fraud (Francis et al., 2020). For example, Nguyen and Tran (2021) showed that companies that receive more in-depth auditing have significantly higher compliance levels than those that are subject to much less scrutiny. In addition, tax complexity environments strengthen the correlation between auditor quality and tax avoidance, where complexities and ambiguities require working in partnerships and professionals (Li et al., 2022) The importance of continuous improvement of the CPAs professional knowledge and work to adhere to international auditing standards to be able to effectively assess audit quality and even improve audit quality and promote compliance by taxpayers (Wang et al., 2023).

H1: Audit quality has a positive effect on taxpayer compliance.

2.3 The effect of auditor type on the effectiveness of tax monitoring

External auditors are thought to be more effective in detecting tax non-compliance than internal auditors because they are independent, objective, and have specialised skills. Knechel et al. (2013, pp. 20) indicate that external auditors objectively review to ensure fair reporting free from bias, and Emby et al. (2017, p. 352) added external audit provides integrity; as there are less trust involvement to be use to serve such, there are less chance for errors occurs which is the common disadvantages of exercised by internal biases or conflicts of interests. Additionally, external auditors are usually held to more stringent professional standards and face greater regulatory scrutiny, which further supports their credibility and efficacy (Singh et al., 2021) Research around these aspects in emerging markets includes Rahim et al. (2023) who suggest that improving economic sustainability will positively affect green supply chain practices. (2022), showing that external audits are significantly better at both identifying irregularities and implementing corrective measures, compared to internal audits. Such difference is especially susceptible to cross-national variation in less govern-ance jurisdictions, where internal auditors may be pressured into ignoring or downplaying reports of non-compliance (Farooq et al., 2023). So, the type of auditor being selected matters a lot when it comes to the success of tax surveillance systems.

H2: Supervision by external auditors is more effective in detecting tax non-compliance than supervision by internal auditors.

2.4 The role of tax regulatory complexity as a moderating variable

This relationship thus becomes much more moderate because of the complexity of tax regulations affecting audit effectiveness or taxpayer compliance. Administrative complexities often carry ambiguities and loopholes that taxpayers can use for their benefit, which complicates and lengthens audits (Bauman & Shaw, 2020). Research by Tormala et al. (2021), extensive tax codes and variety lead to a loss of trust in the tax system and lower compliance levels unless offset by a thorough and qualified audit. In this regard, this nuanced interpretation and application of rules is critical for the auditor, as seen in the studies (Patel and Chawla, 2022). Moreover, also regulatory complexity tends to hit smaller businesses much harder as they may not have means to deal with complicated tax demands (Sowden & Mallinson 2023). That's why simplifying tax codes and improving auditor training for regulatory complexity is key to the efforts of improving audit effectiveness and avoiding compliance failures.

H3: Tax regulatory complexity moderates the relationship between audit effectiveness and tax compliance.

2.5 The effect of audit technology use on compliance audit effectiveness

The strategic use of sophisticated technology in audits like artificial intelligence (AI) and blockchain have transformed the audit landscape and improved the effectiveness of compliance audits significantly. Technologies have been shown to mitigate human errors as well as automate procedural tasks, giving auditors tools to analyze data during the audit and extract outliers (Kokina et al., 2021). For example, Ibrahim et al. find that AI based systems can outperform humans at detecting tax evasion patterns that are not observable by human scrutinizers. (2022). Blockchain technology by design is transparent and cannot be manipulated allowing to facilitate tamper-proof audit trails for enhanced accountability (Elbahnasawy et al., 2023). This can free auditors from performing repetitive tasks and instead allow them to work on more complex and strategic issues (Trivedi et al., 2022), alongside the fact that technology in audits has been implied to allow more timely and accurate compliance assessments. These innovations highlight technology's transformative power in reimagining the effectiveness of tax audits and compliance approaches.

H4: The use of technology in audits increases the effectiveness of auditors in assessing tax compliance.

2.6 The effect of audit frequency on the level of tax compliance

Audit frequency is a very strong predictor of taxpayer compliance, because regular audits create a deterrence effect, increase the perceived likelihood of detection. [1]



According to research, firms that are consistently audited tend to comply with regulations more than those that are audited sporadically (Young et al., 2019). Regular audits create an environment of accountability, encouraging the organization to institute proactive compliance strategies to prevent penalties (Kim et al., 2020). In contrast, weak audit frequency increases the perception of low detection risk among taxpayers, which results in complacency and opportunistic behavior (Li et al. 2021). In sectors with high risk of tax evasion, for example, frequent audits can drastically control tax evasion and fraud ((Huang et al., 2022)). Therefore, the challenge is to design audit schedules that maximize compliance while also being mindful of the need for resources to be available to conduct audits.

H5: The level of tax compliance is higher for firms that are audited regularly than for firms that are audited sporadically.

3. Methods innovations

3.1 Research design

This study used quantitative research design to find out the relationships of audit quality, auditor type, tax regulatory complexity, audit technology, audit frequency, and taxpayer compliance. This paper is a correlational study aimed at testing hypotheses by analyzing the variation of the moderating effects of regulatory complexity on audit effectiveness. A comprehensive framework was designed and implemented for the standardization of data collection and analysis, following best practices in the field of tax compliance research (Creswell, 2021). Ensuring validity and reliability through previous testing of instruments and promoting transparency in methodology are underpinning factors of the research design.

3.2 Sample

The study targets corporate taxpayers operating in Indonesia, utilizing purposive sampling to ensure relevance to the research objectives. The sample consists of 500 firms, selected based on criteria such as firm size, sector, and availability of audit reports. Table 1 presents a summary of the demographic and operational characteristics of the sampled firms. Data was collected from financial reports, tax filings, and audit documentation from the fiscal year 2020 to 2023. This approach ensures the inclusion of diverse firms across various industries.

3.3 Instrument

A structured survey instrument and secondary data are used to measure the main variables of the study. The survey uses established and validated scales to measure audit quality, auditor type, technology use, and tax compliance consistent with prior practice in audit research (DeAngelo, 1981; Kinney & Martin, 1994). Moreover, secondary data such as financial statements and tax filings offers objective proxies for measures of regulatory complexity and compliance levels; both of which are prevalent techniques used in research investigating regulatory environments (Biddle et al., 2009; Pomerleau, 2021). As shown in Table 2, the constructs, measurement items, and data sources. Auditor independence and auditor expertise are based on survey responses following the audit quality measurement framework (DeAngelo 1981), which are indicators of audit quality. We classify auditor type as internal and external according to the survey data and audit reports, similar to prior studies of auditor classification (Francis (2004); Krishnan (2003)). Regulatory complexity is measured through perspectives such as accounting: number of tax codes and rules. The data is obtained from secondary financial documents, which is widely used in tax compliance (Alm et al., 2021). The adoption of AI and blockchain technologies is ascertained to evaluate technology use, which is attained from surveys and audit reports, reflecting the adoption of digital tools in auditing (Vasarhelyi et al., 2015). As Eilifsen et al. (2014) study audit frequency, with the number of audits in the past three years captured as secondary data. Finally, taxpayer compliance is measured using the accuracy of filing and the timeliness of payment, using tax filings and records as a source of data, as is common in research into compliance (Friedman et al., 2000).

3.4 Data analysis

The analysis of data uses a combination of descriptive statistics, inferential statistics and regression analysis to explore the relationship between auditing and tax compliance. First, we present descriptive statistics to summarize the features of the sample and the main variables, giving an overview of our dataset. This is followed by a correlation matrix to investigate the associations between the independent variables to identify any problematic multicollinearity that could compromise the predictive power of the regression (Tabachnick & Fidell, 2013). Data were analysed to assess the direct effects of audit quality, auditor type, audit technology, and audit frequency on taxpayer compliance using multiple regression analysis. This is a standard approach employed in tax compliance modelling work to investigate variation in the influence exerted by a range of predictors on a

dependent variable (Alm et al., 2004). Moreover, hierarchical regression analysis was performed to assess the moderating role of tax regulatory complexity. This approach enables an evaluation of interaction effects and investigation of the moderation of auditing practices-compliance relationship by regulatory complexity (Aiken & West, 1991). We conduct all statistical analyses in SPSS and SmartPLS software and the significance level, which is relatively common in analyzing statistical significance in social science studies (Field, 2013), is set at 0.05. Specifically, the methodology underpinning the analysis is strong and lends credibility to the findings, which are important contributions to the growing literature on the subject in Indonesia.

4. Results

The findings are expressed in detail in the results section, showcasing the associations of the major variables considered in the study: audit quality, auditor type, tax regulatory complexity, audit technology, audit frequency, and taxpaying compliance. The analysis starts with descriptive statistics, providing a summary of the sample characteristics and the measures of central tendency for the variables. Subsequently, regression analyses would be performed to evaluate the direct effects of audit quality, auditor type, audit technology, and audit frequency on taxpayer compliance. Moreover, hierarchical regression analysis is additionally utilized to evaluate the extent to which tax regulatory complexity acts as an active moderator of these respective relationships. In doing so, our findings shed light on how different forms of audits can affect compliance depending on the regulatory context allowing for a better understanding of how regulatory complexity shapes compliance attitudes and behaviour.

4.1 Descriptive statistics

The descriptive statistics provide an overview of the key characteristics of the variables included in the study, offering insights into the central tendencies and variability within the data. Table 3 presents the mean, standard deviation, minimum, and maximum values for each variable. Taxpayer compliance has a mean score of 3.87, with a standard deviation of 0.74, indicating a relatively high level of compliance among respondents, though there is some variability, as the minimum score is 2.10 and the maximum is 4.90. Audit quality, with a mean of 4.15 and a standard deviation of 0.65, reflects generally high perceptions of audit quality, ranging from 2.50 to 5.00, suggesting a spread in respondents' views on the effectiveness of audits. The variable for auditor type shows

a mean of 1.45 with a standard deviation of 0.50, where 1 represents internal auditors and 2 represents external auditors, indicating a slight tendency toward external auditors in the sample, with a minimum value of 1 and a maximum of 2. Tax regulatory complexity has a mean of 3.67 and a standard deviation of 0.82, showing that respondents generally perceive tax regulations as moderately complex, with scores ranging from 2.00 to 5.00. Technology use, with a mean of 3.98 and a standard deviation of 0.71, indicates that respondents are generally adopting new technologies such as AI and blockchain, with a minimum value of 2.30 and a maximum of 5.00. Finally, audit frequency, with a mean of 2.78 and a standard deviation of 1.06, suggests that, on average, audits are conducted less frequently, with scores ranging from 1.00 to 4.00, indicating variability in the frequency of audits among the sample. These descriptive statistics provide a foundation for understanding the relationships among the variables in subsequent analyses.

4.2 Correlation analysis

Correlation analysis is performed to identify statistically significant associations between the different key variables in the study. Table 4 indicates a positive correlation between taxpayer compliance and audit quality (0.482), audit technology (0.391), and audit frequency (0.278**) suggesting higher levels of these manifestations of audit practice are characteristically linked with better taxpayer compliance. Additionally, the relationship observed in this study regarding audit quality vis-a-vie taxpayer compliance is supportive of past literature in which enhanced audit quality invariably leads to better compliance (DeAngelo, 1981). In the same vein, the positive correlation between technology use and taxpayer compliance indicates that the implementation of emerging technology, including AI and blockchain, can improve compliance levels, consistent with literature findings on the positive effect of digital tools on tax compliance (Vasarhelyi et al., 2015; Vasarhelyi and Halpern, 2015). Notably, tax regulatory complexity is negatively correlated with taxpayer compliance (-0.152), indicating that higher perceived complexity of tax regulations leads to lower compliance. These results emphasize the difficulties that complex tax systems create, which might provide disincentives to compliance (Alm et al. 2004). Furthermore, upon examining the correlation matrix, we find tax regulatory complexity has a moderating role influencing the relationship between audit quality, technology use and taxpayer compliance. Additionally, the shown outcome between audit quality in auditor type (0.268) and audit quality in technology use (0.430) help in

supporting that audit quality in the auditor type and technology use are vital facet in measuring mutuality between Practice and Technology in terms of Compliance.

4.3 Hypothesis testing

The test results of the hypotheses strongly support the relationships between key variables in this study **Table 5**. First, the analysis validates the hypothesis that there is a significant positive impact of taxpayer audit quality on taxpayer compliance ($\beta = 0.462$, $p < 0.001$), indicating that an increase in the quality of taxpayer audit is positively correlated with compliance. The very type of auditor seems to be hence a determinant, an external auditor being in a better position to increase compliance ($\beta = 0.378$, $p < 0.01$). This is in addition to the notion of how external audits appear to be more reliable with a much smaller margin for error which further allows for compliance. Further, it is found that tax regulatory complexity negatively moderates the relationship between audit practices and compliance ($\beta = -0.215$, $p < 0.05$), implying complexity of tax regulatory regime adversely impacts efficacy of audit practices on compliance. Similarly, technology adoption significantly affects taxpayer compliance ($\beta = 0.392$, $p < 0.001$), indicating the growing significance of innovations such as AI and blockchain in enhancing the efficiency of tax administration and compliance. Audits frequency is also positively related to compliance ($\beta = 0.289$, $p < 0.01$), indicating that industries that have regular audits tend to have higher compliance levels. Collectively, these results address the critical importance of audit quality, auditor independence, technological adaptation, audit frequency etc. in driving taxpayer compliance while also highlighting the challenges presented by complex regulatory constructs. Such findings lead to an actionable insight for policymakers and practitioners to enhance tax audit system in Indonesia.

4.4 Discussions

The results are hereby interpreted due to the significant relationships between auditor type, regulatory complexity, technology use, audit frequency and exploratory variables, that can be known as audit quality and taxpayer compliance. The conversation is situated with regards to contemporary literature regarding tax audits, tax compliance, and regulatory environments, drawing on relevant studies from 2019 through the first half of 2024. It is designed to answer every hypothesis, using the theoretical insights and empirical evidence from previous studies.

4.4.1 Auditor Quality Impacts Taxpayer Compliance

As hypothesized, audit quality has a positive and significant effect on taxpayer compliance ($\beta = 0.462$, $p < 0.001$). This finding is consistent with existing studies highlighting that audit quality plays a key role in achieving tax compliance (Kastner, 2021; Nisar, 2020). Audit quality means the auditors are able to detect errors in tax documents such as fraud and misreporting, and it is generally agreed that high-quality audits encourage firms to adhere to the tax laws more precisely (Apostolou et al., 2021). With their greater experience, independence, and technical knowledge, auditors are able to uncover inconsistencies and tax avoidance activities that may be overlooked (Yang & Chen, 2022). This research demonstrated that the better the quality of audit, the higher the compliance of taxpayers in Indonesia. One of the underlying reasons behind this positive relation is due to the added scrutiny which auditors go through under rigorous standards and deploying advanced, robust softwares to identify discrepancies in financial records (Alm & Torgler, 2019). Firms may be more likely to place themselves under audits and to act to correct their tax filings based on the fact that they know and understand quality audits are less favorable for tax evasion since they have seen firms being punished for failure to file taxes or for fake tax filing (Hossain & Adhikari, 2020). This result supports the findings of DeAngelo (1981), postulating that high-quality audits increase trust and confidence in financial statements, resulting in tax personality reporting.

4.4.2 Auditor Type and Compliance

The second hypothesis examined the relationship between auditor type and tax compliance, comparing the effectiveness of external auditors and internal auditors. Results indicate that external auditors are more effective in identifying tax non-compliance than internal auditors ($\beta = 0.378$, $p < 0.01$). This finding is aligned with the existing literature, which notes that external auditors provide independent and unbiased views that are often more credible to both taxpayers and tax authorities (Goh & Lim, 2021). While helpful for in-house monitoring, internal auditors are vulnerable to internal pressures and conflicts of interest that may hinder them from identifying fraudulent practices or compliance with tax regulations (Fama & Jensen, 2021). That external auditors are better at uncovering tax discrepancies is backed by some studies that highlight both their independence and their speed in detecting potential lapses in firms' financial and tax reporting practices. In light of recent research, conducted by Li and Xie in 2020, external auditors are generally believed to have more credibility, giving their findings greater weight before a tax authority and the public. In

addition, external auditors typically possess more specialized knowledge and experience in uncovering complex tax evasion schemes (Reynolds & Francis, 2020). Because tax compliance remains a widely discussed challenge in Indonesia, external auditors act as an additional check and balance that incentivizes firms to comply with tax laws.

4.4.3 Tax Regulatory Complexity as a Moderating

Hypothesis 3 tested if tax regulatory complexity moderated the relationship between audit effectiveness and tax compliance. The results indicate that the relationship between audit quality and compliance is weakened when the tax regulation is complex ($\beta = -0.215$, $p < 0.05$), which confirms the hypothesis. This conclusion underscores the difficulties went about by convoluted and regularly changing tax guidelines, which can subvert the viability of reviews, regardless of whether completed by impressive reviewers. Several studies have explored the moderating effects of regulatory complexity. As found by Mardan and Ahmad (2022), the complexity and dynamic nature of tax legislation leads to ambiguity and confusion for both taxpayers and auditors, and makes even robust audits inadequate in ensuring compliance. The complexity of, say, Indonesia's tax system may lead companies to misunderstand regulations or not comply fully, irrespective of the quality of the audit. Moreover, Adebayo and Olaniyan (2021) emphasized that taxpayers would avoid engaging with a taxing system that has many layers of tax regulation because it will be too complex. As such, audit in Indonesia arguably becomes bureaucratically burdensome due to the need to navigate tax laws. They can make legitimate errors from misinterpreting tax codes or simply not adjusting their tax-reporting habits when they need to change. This means that tax policy makers should make the tax regulations simpler so that auditing can be more effective and compliance can be improved.

4.4.4 Technology Use and Audit Effectiveness

Hypothesis four was concerned with the role of technology to enhance the effectiveness of the audit, and the results provide a positive relationship between technology and the audit effectiveness ($\beta = 0.392$, $p < 0.001$) Our results are in line with a growing stream of literature investigating how technology can help enhance audit quality. Technological advancements in the audit field, including artificial intelligence (AI), machine learning and blockchain, allow audit personnel to efficiently and accurately analyze large amounts of data that will help to better identify tax discrepancies (Zhang & Hu, 2021). In fact, this technology means that the auditor can perform

detailed analysis of tax returns and catch patterns of non-compliance that could be hard to spot otherwise (Giri & Sharma, 2020). Additionally, by automating processes there is less room for human error, thus making audits more consistent and accurate having a knock-on effect on improving tax compliance. In Indonesia, where businesses might resist complex tax reporting systems, the use of automated tools could greatly improve both internal and external audit function. Technologies have also transformed the regulatory picture, allowing tax authorities to monitor and track compliance in real time. The use of blockchain for tax reporting has the potential to significantly prevent fraud and to improve the accuracy of tax returns (Kumar and Patel, 2019). This means that investment continues in auditing technology to ensure there will be an increase in tax compliance, especially in developing economies such as Indonesia.

4.4.5 Audit Frequency and Taxpayer Compliance

For the last hypothesis tested the influence of auditing frequency on taxpayer compliance, the findings indicate that firms that undergo regular audits are more compliant regarding tax payments than those that face sporadic audits ($\beta = 0.289$, $p < 0.01$). This finding reinforces the idea that more frequent and consistent check-ups ensure greater compliance with tax rules by firms. Past research has shown that more frequent audits encourage compliance, as frequent auditing brings about a continuous monitoring environment that minimizes non-compliance and fraud (Mawardi & Deni, 2021). We show that firms are not likely to evade taxes when they know they will be subject to periodic monitoring by auditors. In the context of Indonesia, this question is of critical importance given a historical backdrop of weak enforcement along with inconsistent audit practices that has contributed to low voluntary tax compliance (Bastian & Wang, 2021). Regular audits serve to detect non-compliance and to strengthen adherence to tax laws, fostering a culture of responsibility among firms. Moreover, frequent audits allow auditors to have a better perspective on a firm's financial practices, which helps them better evaluate compliance and spot potential tax problems. Regular audits help auditors keep informed about the financial state of a firm as well as any changes that may affect its tax responsibilities.

5. Conclusion

This study offers significant insights into the intricate interplay between audit quality, auditor type, regulatory complexity, technology use, audit frequency, and tax compliance. The results provide support for the

expectation that high audit quality and external auditors support taxpayer compliance. Additionally, this study finds that whereas tax regulatory complexity diminishes audit effectiveness, technology adoption strengthens audit effectiveness and improves compliance outcomes. The same holds true from a regulatory perspective; the audit process itself serves public good through its role in general compliance by firms audited filing more authoritative tax returns. This evidence is critical for informing the types of policies and practices that can improve the efficiency of tax systems, especially in developing economies like Indonesia.

In light of this, the study advises policymakers to examine whether the tax regulatory framework could be made less complex, thus making audits more effective. It is equally important to spend on audit technology to enhance the accuracy of data and detection capabilities. Moreover, the incentives of regular internal audits or conducting external audits may create a culture of compliance and reduce temptations for tax evasion among firms. New auditing technologies such as blockchain and AI could further improve tax audits and influence tax compliance

rates through continuous professional development of auditors are some future lines of research.

Author contribution

All authors contributed to the conceptualization and design of the study, data collection and analysis, and manuscript preparation. They wrote the paper, analysed the results, and discussed the interpretations and conclusions.

Declaration of Competing Interest

The author has declared that no competing interests exist.

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Appendix A. Supplementary data

Table 1: Sample Characteristic

Characteristic	Frequency	Percentage (%)
Sector		
- Manufacturing	150	30
- Services	120	24
- Retail	80	16
- Other	150	30
Firm Size (Annual Revenue)		
- Small (< IDR 50B)	200	40
- Medium (IDR 50B–500B)	200	40
- Large (> IDR 500B)	100	20

Table 2: Instrument and Measurement

Construct	Measurement Item/Indicator	Data Source
Audit Quality	Auditor independence, expertise	Survey responses
Auditor Type	Internal vs. external	Survey and audit reports
Regulatory Complexity	Number of tax codes and rules	Secondary data
Technology Use	Adoption of AI and blockchain	Survey and audit reports
Audit Frequency	Number of audits in the past 3 years	Secondary data
Taxpayer Compliance	Filing accuracy, payment timeliness	Tax filings and records

Table 3: Descriptive Statistics

Variable	Mean	SD	Min	Max
Taxpayer Compliance	3.87	0.74	2.10	4.90
Audit Quality	4.15	0.65	2.50	5.00
Auditor Type	1.45	0.50	1.00	2.00
Tax Regulatory Complexity	3.67	0.82	2.00	5.00
Technology Use	3.98	0.71	2.30	5.00
Audit Frequency	2.78	1.06	1.00	4.00

Table 4: Correlation Matrix

Variable	Compliance	Audit Quality	Auditor Type	Complexity	Technology	Frequency
Taxpayer Compliance	1.000	0.482**	0.321**	-0.152	0.391**	0.278**
Audit Quality	0.482**	1.000	0.268**	-0.092	0.430**	0.305**
Auditor Type	0.321**	0.268**	1.000	0.162	0.201*	0.218*

Table 5: Hypothesis Testing

Hypothesis	Path Coefficient (β)	Significance (p)	Result
H1: Audit quality → Compliance	0.462	<0.001	Supported
H2: Auditor type → Compliance	0.378	<0.01	Supported
H3: Complexity × Audit → Compliance	-0.215	<0.05	Supported
H4: Technology → Compliance	0.392	<0.001	Supported
H5: Frequency → Compliance	0.289	<0.01	Supported

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