INTERNATIONAL JOURNAL OF SOCIAL SCIENCE HUMANITY & MANAGEMENT RESEARCH

ISSN (print) 2833-2172, ISSN (online) 2833-2180

Volume 04 Issue 12 December 2025

DOI: 10.58806/ijsshmr.2025v4i12n23, Impact Factor: 6.79

Page No. 2412-2423

The Impact of Financial Distress, Capital Intensity and Firm Size on Tax Avoidance: The Moderating Role of Digital Implementation

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ABSTRACT: This paper aimed to test the direct effect of financial distress, capital intensity, and firm size on tax avoidance. Furthermore, it tested the moderating impact of digital implementation on the effect of financial distress, capital intensity, and firm size on tax avoidance. The method used is moderation regression analysis. The sample used 135 manufacturing sector companies listed on the Indonesia Stock Exchange in 2021-2023. The sampling technique used purposive sampling. The results of the study proved that financial distress had a positive effect on tax avoidance. Capital intensity and firm size had no effect on tax avoidance. Furthermore, digital implementation had been shown to weaken the effect of financial distress, capital intensity, and firm size on tax avoidance. Digital implementation had been shown to reduce corporate tax avoidance actions caused by financial distress, capital intensity and firm size. Digital implementation improved efficient supervision which encourages companies to avoid tax avoidance. It is very important to recommend that digital implementation be implemented in every company. This will facilitate the supervision of corporate taxation carried out by the tax authority. Digital implementation can contribute significantly to increasing the tax ratio in the future.

KEYWORDS: Capital Intensity, Digital Implementation, Financial Distress, Firm Size, Tax avoidance

1. INTRODUCTION

Tax ratios in several ASEAN countries have different achievements. The tax ratio in 2023 in Thailand is 17.18%, Vietnam 16.21%, and Singapore 12.96%. Meanwhile, Indonesia's tax ratio is the lowest, which is 10.31% (Budiyanti, 2024). The tax ratio shows the contribution of tax revenue to Gross Domestic Product. The tax ratio in Indonesia is still far from optimal. This causes Indonesia to rely more on financing sources, such as foreign debt to meet development needs. Although Indonesia has better tax potential with a diverse population and economic activities. This low tax ratio shows that the potential for tax revenue is not optimal. This is due to tax avoidance actions taken by companies.

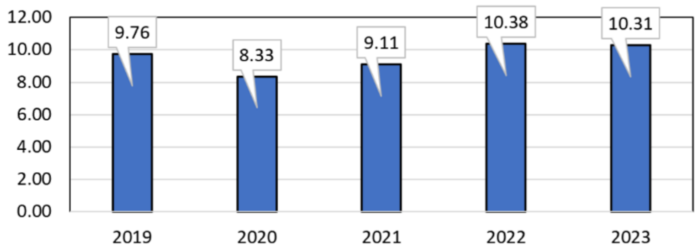

Fig. 1. Indonesia Tax Ratio 2019-2023

Judging from the figure above, Indonesia needs a fundamental strategy to improve its tax ratio performance. Until 2023, Indonesia's tax ratio figure is still 10.31%, far below the international standard according to the IMF, which is a minimum of 15%. This figure is the ideal limit for Indonesia to be able to independently finance its development (Candra, 2024). The Minister of Finance of the Republic of Indonesia Sri Mulyani said that the performance of tax revenues in 2023 was relatively positive even though the 2023 tax ratio was smaller than the previous year which was 10.38%. The realization of tax revenues reached IDR 2,155.4 trillion throughout 2023 or equivalent to 101.7% of the target of IDR 2,118.3 trillion. The performance of this revenue also experienced a growth of 5.9% (Kurniati, 2024). This condition proves that taxation plays an important role in supporting the development and sustainability of the Indonesian economy, especially as an indicator of economic independence. The tax strategy in Indonesia needs to be improved to improve the tax ratio. However, this is not linear with the company's perception, where tax is a burden incurred by the company that can reduce the company's profits or profits, so the company makes one effort not to pay taxes by avoiding taxes (Taufik & Muliana, 2021). The practice of tax avoidance is said to be consistent with tax laws and regulations, because it is believed to exploit loopholes in tax laws that affect government revenues from the tax department. On the one hand, tax avoidance is allowed, but on the other hand tax avoidance is not allowed (Agustina et al., 2023) because it is contrary to tax morality (Tambun & Haryati, 2022).

Research gaps on the influence of financial distress, capital intensity and firm size on tax avoidance still often occur from previous research results. Tax avoidance efforts themselves are often associated with the financial distress conditions experienced by the company. According to the results of research conducted by Uliganda & Hermi (2024), it showed that financial distress has a positive effect on tax avoidance. This means that when a company experiences financial difficulties, it can encourage the company to find alternative ways to reduce the tax burden (X. Guo et al., 2024; Hajek & Munk, 2024; Le et al., 2024). However, the results of research conducted by Pratiwi et al. (2021) showed that high financial distress will reduce tax avoidance actions. In other words, if a company is in financial difficulties, it will reduce tax avoidance practices because it will potentially be difficult to obtain funding sources, especially from investors, because investors are worried about the possibility of the company being liquidated which will ultimately use up the shares that have been invested by investors in the company. Based on the research gap or inconsistency in the results of this study, further research is needed to re-prove how financial distress currently influences tax avoidance.

Tax avoidance practices are also influenced by capital intensity, as studied by Kurniawati & Mukti (2023). This study shows that the higher the capital intensity of a company, the higher the tax avoidance practices carried out. Fixed assets owned by the company create a depreciation burden that can reduce profit before tax, so that it can minimize the tax burden by investing fixed assets in the company. However, the results of research conducted by Dewi & Oktaviani (2021) show that capital intensity has no effect on tax avoidance. This is because companies that have a number of fixed assets with an expired useful life cannot be depreciated and will not be a reduction in profit after tax. This means that these fixed assets are more utilized to increase company profits. Based on the research gap or inconsistency of the results of this study, further research is needed to prove the effect of capital intensity on tax avoidance at this time.

The third factor that influences the occurrence of tax avoidance practices is firm size as studied by Prastiyanti & Mahardhika (2022). Firm size has a positive effect on tax avoidance. The large size of the company indicates a very high level of financial complexity so that companies tend to take advantage of existing loopholes to carry out tax avoidance from each transaction in order to reduce the tax burden. However, different research results were proven by Stefanie & Yuniarwati (2022), which showed that the larger the company size, the greater the ability to generate large profits, so that they are able to pay their tax obligations compared to small companies. Based on the research gap and inconsistency of the results of this study, further research is needed to prove the effect of firm size on tax avoidance.

The uniqueness of this study compared to previous studies lies in two things. First, there has been no previous study that places financial distress, capital intensity, and firm size as independent variables in one research model. Second, the digital implementation variable is placed as a moderating variable to strengthen or weaken the relationship between factors that influence tax avoidance. The novelty of this study is placing Digital Implementation as a variable that moderates the factors that influence tax avoidance. The selection of the digital implementation variable as a moderating variable is motivated by the development of business practices by utilizing digital information technology in data processing and taxation, allowing companies to design more efficient tax strategy innovations that can potentially increase tax avoidance. Digital Implementation implemented by companies can provide convenience for taxpayers in fulfilling their obligations in the era of the ever-growing digital economy (Hevyani, 2024). This increases the effectiveness of the government in collecting and analyzing taxpayer data, both transactions and authorities in monitoring in an integrated manner, such as the DJP Online service which facilitates the administration process. So, with this digital implementation, it increases the effectiveness of companies in the decision-making process in conditions of financial difficulties. Companies that already have large capacities tend to utilize technology to optimize their tax obligations (Karlinah et al., 2024).

Based on the phenomenon of the decline in Indonesia's tax ratio in 2023, as well as the fact that Indonesia's tax ratio is below several ASEAN countries, as well as the research gap in previous studies, it is necessary to examine the effect of financial distress, capital intensity and firm size on tax avoidance, as well as the moderating impact of digital implementation. This study used the Industrials sector listed on the Indonesia Stock Exchange (IDX) from 2021 - 2023, because the industrials sector has a higher level of transaction and organizational complexity, thus opening up opportunities for tax avoidance practices. Judging from the contribution to the industrials sector in 2023, it experienced growth of only 7.4% or slowed down from the previous year which grew by 24.8%. In addition, the industrials sector has a significant contribution to Indonesia's GDP so that tax avoidance practices in this sector can have a major impact on state tax revenues. Based on the phenomena and facts above, it is the background for the author to conduct research on the Influence of Financial Distress, Capital Intensity, and Firm Size on Tax Avoidance with Digital Implementation as a Moderator in Industrial Sector Companies Listed on the Indonesia Stock Exchange in 2021-2023.

2. LITERATURE REVIEW AND HYPOTHESIS

This study used two grand theories to examine the research model and research problems, namely agency theory and technology acceptance model theory. First, agency theory from Jensen & Meckling (1976) discusses the relationship between the principal (shareholder or owner of the company) and the agent (manager or party that manages the company). This theory explains that the principal gives the agent the authority to make decisions related to the company's operations. However, the principal and agent have different goals and interests, which gives rise to a conflict of interest. In addition, there is information asymmetry, where the agent has more information about the company's operations than the principal, which can cause an imbalance in decision making Astriyani & Safii (2022). According to Gumono (2021) in the context of taxation, the parties involved are the government and taxpayers/companies. The government as the principal and taxpayers as agents. Both have different interests, the government needs taxes for its income while taxpayers have an interest in minimizing their tax burden and also increasing their company's profits. The government cannot maximize its tax revenues due to opportunistic actions from taxpayers. Second, the Technology acceptance model aimed to predict the adoption and use of new technology by an individual or entity by focusing on usefulness and convenience (Davis, 1985; Holden & Karsh, 2010; Silva, 2015). In this context, the relevance of the technology acceptance model focused on taxpayers (users) feeling that the digital system implemented makes it easier for them to fulfill their tax obligations and provides clear benefits so that they tend to be more compliant and avoid tax avoidance practices (Sevendy et al., 2023). Technology is very important in all aspects of human life (Heryanto et al., 2023). Based on the technology acceptance model, the existence of digital implementation simplifies the administrative process that encourages taxpayers (users) to fulfill their tax obligations on time and as a means of education for taxpayers in accessing information on tax regulations in order to improve their compliance. This digitalization provides real benefits that facilitate reporting and payment because it is properly designed to improve taxpayer performance.

HYPOTHESIS DEVELOPMENT

The Effect of Financial Distress on Tax Avoidance

Agency theory that highlights the conflict of interest between agents and principals. When a company experiences financial distress, managers are motivated to improve financial performance in order to maintain the sustainability of their company, by increasing tax avoidance strategies, so that cash flow improves. Managers make decisions that benefit themselves, aiming to improve their personal reputation or other interests, such as their compensation & bonuses that are not in line with shareholders. According to Fadhlia & Arifin (2022), financial distress is a condition where a company experiences a phase of declining profits and business activities that are not comparable to the obligations to be borne, so that the company experiences losses. If this condition is continuously experienced by the company and cannot be handled, the company will go bankrupt. High financial distress reflects a condition where the company is experiencing significant financial difficulties so that it is unable to meet its financial obligations on time & shows negative cash flow because expenses are greater than income (Boháč et al., 2023; Cui & Wang, 2023; Figlioli & Lima, 2022). This condition indicates that the income obtained is not enough to finance its operations so that it also experiences difficulties in meeting its tax obligations (X. Guo et al., 2024; Le et al., 2024), which has an impact on the risk of default and worsens the company's financial condition which affects tax avoidance practices to minimize the tax burden obtained so that the net profit after tax obtained increases to overcome liquidity problems. According to Retnaningdya & Cahaya (2021), tax avoidance is an action to save or minimize taxes in the applicable tax law (lawful fashion). This action is usually carried out by exploiting weaknesses in tax law that do not seem to violate tax law. Therefore, it can be concluded that tax avoidance is an action that can be taken by taxpayers by exploiting weaknesses in the applicable laws to reduce the company's tax burden (Athira & Ramesh, 2024; Mkadmi & Ali, 2024). The higher the financial distress, the higher the tax avoidance will be. This is supported by research conducted by Uliganda & Hermi (2024), Tabroni & Haq (2024), and Fadhila & Andayani (2022) that financial distress has a positive effect on tax avoidance. So, the research hypothesis is H_1: Financial distress has a positive effect on tax avoidance.

The Effect of Capital Intensity on Tax Avoidance

Agency theory emphasizes the relationship between principal and agent in a company. If a company has a significantly large fixed asset structure from the total assets owned, managers tend to be intense in carrying out tax avoidance practices to minimize tax liabilities. This is a short-term goal for the company and benefits managers for performance compensation. Meanwhile, the principal's perspective focuses on long-term profits to increase growth & stability, especially in utilizing fixed assets to increase production and the effectiveness & efficiency of the company's operations. According to Yunie (2022), capital intensity is a funding activity carried out by a company that is continuous with funding in the form of fixed assets or capital intensity. The capital intensity ratio indicates how much the company's ability is to use its fixed activities to generate sales. The more fixed assets a company has, the greater the depreciation, resulting in lower taxable income and effective tax rates (Hasan et al., 2021; Sikes & Verrecchia, 2025). A high capital intensity value reflects a significant portion of the company's total fixed assets from the total assets owned, resulting in a larger depreciation burden. This can be utilized by managers to carry out tax avoidance through depreciation charges (Jin, 2021; Sánchez-Ballesta & Yagüe, 2023). The impact on reducing pre-tax profit, becomes lower so that tax liabilities are low. This condition reflects that the higher the capital intensity value, the higher the tax avoidance will be (Athira & Ramesh, 2024; Mkadmi & Ali, 2024). This is supported by research conducted by Pramaiswari & Fidiana (2022), Pramesti et al. (2022), and Arinda et al. (2022) which states that capital intensity has a positive effect on tax avoidance. So, the hypothesis in this study H_2: Capital intensity has a positive effect on tax avoidance.

The Effect of Firm Size on Tax Avoidance

Agency theory explains that principals tend to view high company size as an indication of stability and growth potential. The larger a company tends to have many resources, market share, and high investment capacity to increase its long-term stability. However, the larger the company size can increase the complexity of the organization which causes monitoring problems, so a better control system is needed. From an agent's perspective, a large company size is an opportunity to expand operations, improve performance by utilizing available resources, and implement strategies for compensation purposes in the form of performance-based bonuses. This creates a conflict of interest between the company agent and the principal. According to Heliani & Elisah (2022), firm size is the scope of an organization and the responsibilities it carries. The size of a company can be described by the size of the company owned either based on total assets, sales, or average sales. A high firm size value indicates a large asset value, so it can be used by managers to avoid taxes by utilizing depreciation expenses to minimize profit (Liu et al., 2022; Riedel & Simmler, 2021) so that they are legally taxed by exploiting regulatory loopholes. In addition, a high firm size value reflects the existence of large resources, especially human resources who are experts in law or accounting so that they are able to carry out tax avoidance more effectively (Hai et al., 2024; He & Yi, 2023). This condition reflects that the higher the firm size value, the higher the tax avoidance. This is supported by research conducted by Maulana et al. (2021), Nyman et al. (2022), and Dewi & Setiyono (2021) that firm size has a positive effect on tax avoidance so that the hypothesis H_3: Firm size has a positive effect on tax avoidance.

Moderation of Digital Implementation on the Effect of Financial Distress on Tax Avoidance

The technology acceptance model theory explains that technology will simplify the administrative process. Likewise, digital implementation can simplify the administrative process that encourages taxpayers to fulfill their tax obligations on time, as well as a means of education for taxpayers in accessing information on tax regulations to improve their compliance. Previous researchers stated that in conditions of financial distress, companies tend to do tax avoidance for reasons of efficiency (Athira & Ramesh, 2024; Boháč et al., 2023; J. Zhao et al., 2024). The presence of digitalization will reduce the tendency to do tax avoidance because digitalization makes business processes and tax reporting more transparent. This digitalization provides real benefits that facilitate reporting and payments because it is properly designed to improve transparency and taxpayer performance (Y. Guo et al., 2024; He & Yi, 2023; Pang & Hua, 2024). According to Nanda & Kholid (2024), digital implementation is a comprehensive organizational change that includes human, strategic, and structural aspects by utilizing the application of digital technology and customized business models to improve organizational performance. Rapid technological developments encourage companies to adopt digital tools to expand market reach, as well as increase the efficiency and effectiveness of their business processes. Digital implementation has the potential to improve corporate governance competency. Tax avoidance practices can decline due to the presence of digital implementation. Digitalization supports the development of digital business models by implementing digital technology that increases transparency, accuracy, and reliability of more transparent information so as to minimize friction between agents and principals. With digital implementation, tax authorities can carry out more effective supervision of tax avoidance practices through real-time monitoring and access to a centralized taxpayer information system. It becomes more difficult for companies to avoid taxes because of digital implementation which is able to improve supervision of company performance and detect potential tax avoidance practices, as stated by Rosyid et al. (2024), Fang et al. (2023), and Xie & Huang, (2023). Therefore, digital implementation as a moderator is able to weaken the positive influence of financial distress on tax avoidance so that the hypothesis is H_4: Digital Implementation weakens the influence of financial distress on tax avoidance.

Moderation of Digital Implementation on the Effect of Capital Intensity on Tax Avoidance

Technology acceptance model theory explains that digital implementation can improve the efficiency of corporate asset governance. Efficient management of fixed assets will reduce tax costs. Digital implementation helps in calculating depreciation, so it is useful in increasing efficiency and effectiveness. Tax avoidance practices can increase because the presence of digital implementation improves asset management with a more productive & strategic accounting system (Hai et al., 2024; Xu et al., 2025). Digitalization will increase transparency and accountability which has an impact on principals becoming easier to obtain information & make decisions on optimizing their resources. Companies with high capital intensity tend to do tax avoidance, but the presence of digitalization will change the process and reporting to be transparent. Companies that have high capital intensity show large and complex fixed asset ownership which is often used to avoid taxes through depreciation costs. Tax avoidance practices can decrease due to the presence of digital implementation through security monitoring of suspicious transactions & sophisticated data analysis. Digitalization can identify financial performance or unusual patterns or suspicious transactions by the principal in real time (Chen et al., 2024; Lv & Wu, 2024), so that tax avoidance practices decrease. This is in line with research conducted by avoidance Rosyid et al. (2024), Fang et al. (2023), and Xie & Huang, (2023). Thus the hypothesis is H_5: Digital implementation weakens the effect of capital intensity on tax avoidance.

Moderation of Digital Implementation on the Effect of Firm Size on Tax Avoidance

The technology acceptance model theory explains that the use of technology will help manage large assets efficiently. Companies that have a high firm size reflect a large company size or high asset resources. A large firm size has many transactions. Many transactions create more opportunities for tax avoidance actions. However, if the transactions have been managed well by the IT team, the system will be more transparent and efficient. The IT team manages and implements the system better, making it easier to use technology to minimize errors in carrying out its tax obligations (Hai et al., 2024; Lv & Wu, 2024; Q. Zhao & Wang, 2025). Digitalization is very helpful in identifying the position of each asset owned using a barcode. This is in line with research conducted by Rosyid et al. (2024), Fang et al. (2023), and Xie & Huang, (2023). Companies with high firm size have many opportunities to carry out tax avoidance. The use of digitalization in asset management will increase transparency. Including asset transactions related to tax activities will be more efficient and transparent. This means that digital implementation moderation will reduce the positive influence of firm size on tax avoidance. Thus the hypothesis is H_6: Digital Implementation weakens the influence of firm size on tax avoidance.

3. RESEARCH METHODOLOGY

The population of this study is industrial sector companies listed on the Indonesia Stock Exchange in 2021-2023 with a total of 228 companies. The sample used was 135 companies after being selected using the purposive sampling method. The panel data processed came from financial reports available on the company's website or can be obtained from the Indonesia Stock Exchange website, namely www.idx.co.id. This study consists of one dependent variable, three independent variables, and one moderating variable. The dependent variable is tax avoidance using the effective tax rate proxy. Tax avoidance is a way to minimize the tax burden in a legal way and does not violate the law which can be measured using the effective tax rate through a comparison between the total tax burden and profit before tax so as to provide an overview of how effective the company is in managing its tax obligations (Nofriansyah et al., 2024). The results of the effective tax rate describe tax compliance, while to calculate tax avoidance, the ratio is multiplied by minus 1. The first independent variable is financial distress. Financial distress is a condition of a company that is experiencing significant financial difficulties that interfere with its ability to meet financial obligations. Financial distress uses the Altman Z-score model proxy to identify the possibility of financial distress (Bachtiar & Handayani, 2022). The second independent variable is capital intensity. Capital Intensity is the level of capital invested in the company's fixed assets to provide benefits through the calculation between total fixed assets and total assets. Capital intensity uses a proxy comparison of the number of fixed assets with total assets (Dewi & Oktaviani, 2021). Firm Size is the third independent variable. Firm Size is the scale of a company, the larger the total assets, the larger the size of a company. Firm size uses the natural logarithm proxy for total assets (Setiawan et al., 2022). Moderator variables are variables that influence (strengthen and weaken) the relationship between independent and dependent variables (Sugiyono, 2013). In this study, the moderator variable used is digital implementation. According to Fang et al. (2023), digital implementation is the application of digital technology to improve the efficiency and competitiveness of companies in various aspects of company operations. Digital implementation can be measured by content analysis through the development of words related to digitalization. There are eight words that are a description of the implementation of digital implementation, namely intelligence, digitalization, automation, artificial intelligence, machine learning, cloud computing, big data, blockchain. The measurement used is the ratio of the index score found from the eight words.

The analysis stages consist of several stages. First, descriptive statistics to find out the description of the research data. Second, selecting the best model among the common effect model, fixed effect model or random effect model. Third, classical assumption test, if the best is the common effect model or fixed effect model (Ditzen et al., 2021). The classical assumption test consists of data normality test, multicollinearity test, autocorrelation test, and heteroscedasticity test (Tambun & Sitorus, 2024). However, if the best is the random effect model, then the classical assumption test does not need to be done (Smith et al., 2022). Fourth, test the research hypothesis using one tailed. The standard for measuring hypothesis acceptance if t count > 1.65 and p values < 0.05 (Sitorus & Tambun, 2023). Fifth, calculate the coefficient of determination value to determine the ability of financial distress, capital intensity, firm size in explaining tax avoidance, and the moderating impact of digital implementation. The sixth is to explain the regression equation produced in this research model.

4. RESULT AND DISCCUSION

This study has a total of 405 processed data consisting of 135 company samples during 2021 to 2023. The samples used in the descriptive statistical data analysis test. The following are the results of the descriptive statistical analysis.

Table 1. Results of Descriptive Statistical Tests

Variable	Obs	Mean	Std. Dev.	Min	Max
Financial distress	405	4.0987	1.7447	-2.02	41.19
Capital intensity	405	.4749	.2021	.11	.90
Firm size	405	28.4557	1.6494	25.52	33.73
Tax avoidance	405	.1975	.0526	-5.35	5.28
Digital implementation	405	.4336	.1808	.13	.88

Source: Stata output, 2025

Financial distress has a minimum value of -2.02 found in PT Intraco Penta Tbk. Meanwhile, the maximum value of financial distress is 41.19 found in PT Perdana Bangun Pusaka Tbk. The standard deviation value of financial distress is 1.74 which is smaller than the mean value of financial distress of 4.09, meaning that financial distress has homogeneous data so that it is able to explain changes or variations in it. Capital intensity has a minimum value of 0.11 found in PT Kobexindo Tractors Tbk. Meanwhile, the maximum value of capital intensity is 0.9 found in PT Intikeramik Alamsari Inudstri Tbk. The standard deviation value of capital intensity is 0.20 which is smaller than the mean value of capital intensity which is 0.47, indicating that capital intensity has homogeneous data so that it is able to explain changes in variations in it. Firm size has a minimum value of 25.52 found in PT Perdana Bangun Pusaka Tbk. Meanwhile, the maximum value of firm size is 33.73 found in PT Astra International Tbk. The standard deviation value of firm size is 1.6 which is smaller than the mean value of firm size, indicating that firm size has homogeneous data so that it is able to explain changes in variation within it. Tax avoidance has a minimum value of -5.35 found in PT Lion Metal Works Tbk. While the maximum value of tax avoidance obtained is 5.28 found in PT Keramika Indonesia Assoisasi Tbk. The standard deviation value of tax avoidance is 0.05 which is smaller than the mean value of tax avoidance is 0.19, indicating that tax avoidance has homogeneous data so that it is able to explain changes or variations within it. Digital implementation has a minimum value of 0.13 found in PT Kokoh Inti Arebama Tbk. Meanwhile, the maximum value of digital implementation is 0.88 found in PT Asahimas Flat Glass Tbk. The standard deviation value of digital implementation is 0.18 which is smaller than the mean value of digital implementation is 0.43, indicating that digital implementation has homogeneous data so that it is able to explain changes in variation within it.

The selection of the best model among the common effect model, fixed effect model or random effect model is done with three testers, namely the Chow Test, LM Tests and Hausman Test. The following is a summary of the results of the three tests, along with the decision of the best model.

Table 2. Results of the best model test

No.	Best Model Testing	Measurement	Decision
1	Chow Test	Rho Score = 0.82 > 0.50	FEM is better than CEM
2	Lagrange Multiplier Test	Prob > Chibar ^{2} = 0,00 < 0.05	REM is better than CEM
3	Hausman Test	Prob > Chibar ^{2} = 0.18 > 0.05	REM is better than FEM

Source: Stata output, 2025

The first test result, the chow test, produced a rho value of 0.82 > 0.5, which means that the fixed effect model is better than the common effect model. Second, the langrange multiplier test produced a chibar square probability of 0.00 < 0.05, which means that the random effect model is better than the common effect model. Third, the hausman test produced a chibar square probability of 0.18 > 0.05, which means that the random effect model is better than the fixed effect model. Thus, the proof of the research hypothesis is carried out using a random effect model. Because the random effect model is the best, the classical assumption test does not need to be carried out because the regression is made from ordinary least squares to generalized least squares.

The results of the research hypothesis testing using the random effect model, both for testing the direct effect hypothesis and the moderating effect are presented in the following table.

Table 3. Hypothesis Testing Results

No.	Hyphotesis	Coefficient	T Statistics	P Value	Decision
1	H_1: FD has a positive impact on TA	0.38	2.29	0.032	Accepted
2	H_2: CI has a positive impact on TA	0.15	0.43	0.214	Rejected
3	H_3: FS has a positive impact on TA	0.19	0.89	0.145	Rejected
4	H_4: DI weakens the influence of FD on TA	-0.24	-2.49	0.028	Accepted
5	H_5: DI weakens the influence of CI on TA	-0.11	-2.71	0.023	Accepted
6	H_6: DI weakens the influence of FS on TA	-0.13	-2.86	0.019	Accepted
Description: FD is financial distress, CI is capital intensity, FS is firm size, DI is digital implementation, and TA is tax avoidance.					

Source: Stata output, 2025

The results of the hypothesis testing prove that four hypotheses are accepted and two hypotheses are rejected. The following is a discussion for each hypothesis.

The effect of financial distress on tax avoidance

The results of the hypothesis test prove that financial distress has a positive effect on tax avoidance. This is evident from the p values of 0.032 < 0.05 and the t value of 2.29 > 1.65. This means that the higher the financial distress value, the greater the tax avoidance. The results of this study are in accordance with the hypothesis H_1 which states that financial distress has a positive effect on tax avoidance. High financial distress reflects a company that is experiencing financial difficulties so that it tends to do ways to reduce its tax burden in order to maintain the liquidity and sustainability of its company. Based on agency theory which highlights the conflict of interest between managers (agents) and shareholders (principals), when a company experiences financial distress, managers are encouraged to improve financial performance in order to maintain the sustainability of their company by increasing tax avoidance strategies so that cash flow becomes better. So that managers make decisions that only benefit themselves to improve their personal reputation or other interests such as their compensation & bonuses that are not in line with shareholders. High financial distress reflects a condition in which a company experiences significant financial difficulties so that it is unable to meet its financial obligations on time & shows negative cash flow because expenses are greater than income. This condition indicates that the income obtained is not sufficient to finance its operations so that it also experiences difficulties in meeting its tax obligations, which has an impact on the risk of default and worsens the company's financial condition which affects tax avoidance practices to minimize the tax burden obtained so that the net profit after tax obtained increases to overcome liquidity problems. This condition reflects that the higher the financial distress, the higher the tax avoidance will be and this result is in line with the results of previous studies (Athira & Ramesh, 2024; Boháč et al., 2023; Cui & Wang, 2023; Figlioli & Lima, 2022; X. Guo et al., 2024; Le et al., 2024; Mkadmi & Ali, 2024). The results of this study are also in line with those conducted by Uliganda & Hermi (2024), Tabroni & Haq (2024), and Fadhila & Andayani (2022) that financial distress has a positive effect on tax avoidance. However, it is not in line with the research conducted by Yunus et al. (2024) which stated that financial distress has a negative effect on tax avoidance. In addition, the results of this study are not in line with those conducted by Enggelina (2024).

The effect of capital intensity on tax avoidance

The results of the hypothesis test prove that capital intensity does not affect tax avoidance. This is evident from the p values of 0.214 > 0.05 and the calculated t value of 0.43 < 1.65. This means that the high and low capital intensity does not affect tax avoidance. The results of this study are not in accordance with the H_2 hypothesis which states that capital intensity has a positive effect on tax avoidance. The high and low values of capital intensity do not affect tax avoidance. This is because the depreciation burden that arises due to the large number of fixed assets owned can increase tax liabilities in certain contexts. In addition, differences in depreciation methods used for tax reporting can cause corrections which, if the fiscal correction is positive, will increase taxable income and tax liabilities. Thus, tax avoidance can be influenced by other factors as well, such as leverage or profitability. Based on agency theory which emphasizes the difference in interests between managers (agents) and shareholders (principals), it causes a mismatch in tax avoidance taken by the company. This is because managers are interested in minimizing their tax burden by reducing pre-tax profits while shareholders have an interest in maximizing the net profit obtained. The results of this study are in line with those conducted by Fatimah et al. (2021). However, the results of this study are not in line with those conducted by Pramaiswari & Fidiana (2022), Pramesti et al. (2022), and Arinda et al. (2022) which stated that capital intensity has a positive effect on tax avoidance. This study does not support previous studies that prove that capital intensity plays a significant role in influencing tax avoidance (Athira & Ramesh, 2024; Hasan et al., 2021; Jin, 2021; Mkadmi & Ali, 2024; Sánchez-Ballesta & Yagüe, 2023; Sikes & Verrecchia, 2025).

The effect of firm size on tax avoidance

The results of the hypothesis test prove that firm size has no effect on tax avoidance. This is evident from the p values of 0.145 > 0.05 and the calculated t value of 0.89 < 1.65. This means that the high and low firm size does not affect tax avoidance. The results of this study are not in accordance with the H_3 hypothesis which states that firm size has a positive effect on tax avoidance. The high and low values of firm size do not affect tax avoidance. This is because companies that are large or small tend to maintain their reputation and the long-term impact of tax avoidance practices such as tax audits or audits carried out by auditors even though they have the capacity to do so. Based on agency theory which emphasizes the difference in interests between managers (agents) and shareholders (principals) causes a mismatch in tax avoidance taken by the company. This is because managers are interested in minimizing their tax burden by reducing profit before tax while shareholders have an interest in maximizing the net profit obtained. However, in line with what was done by (Simbolon & Masyitah, 2024). However, the results of this study are not in line with those conducted by Maulana et al. (2021), Nyman et al. (2022), and Dewi & Setiyono (2021) which stated that firm size has a positive effect on tax avoidance. The results of this study do not support previous studies which stated that firm size has a significant effect on tax avoidance (Hai et al., 2024; He & Yi, 2023; Liu et al., 2022; Riedel & Simmler, 2021).

Moderation of digital implementation on the effect of financial distress on tax avoidance

The results of the hypothesis test prove that the p value is 0.028 < 0.05 and the t value is -2.49 > 1.65, indicating that digital implementation plays a negative role in moderating financial distress and tax avoidance. The results of this study are in accordance with the H_4 hypothesis which states that digital implementation weakens the positive effect of financial distress on tax avoidance. The results of this study mean that the interaction between digital implementation and financial distress weakens the effect of financial distress on tax avoidance. The results of this study complement previous research evidence stating that digitalization makes companies more transparent and better at following tax regulations (Athira & Ramesh, 2024; Boháč et al., 2023; Y. Guo et al., 2024; He & Yi, 2023; Pang & Hua, 2024; J. Zhao et al., 2024). This shows that digital implementation has contributed to reducing the impact of financial distress on tax avoidance. The results of this study are in line with those conducted by Rosyid et al. (2024), Fang et al. (2023), and Xie & Huang, (2023) which stated that the moderating role of digital implementation can weaken the positive influence of financial distress on tax avoidance.

Moderation of digital implementation on the effect of capital intensity on tax avoidance

The results of the hypothesis test prove that the p values are 0.023 < 0.05 and the t value is -2.71 > 1.65, indicating that digital implementation plays a role in moderating capital intensity and tax avoidance. The results of this study are in accordance with the H_5 hypothesis which states that digital implementation weakens the positive effect of capital intensity on tax avoidance. The results of this study mean that the interaction between digital implementation and capital intensity weakens the effect of capital intensity on tax avoidance. This proves that digital implementation contributes to moderating the effect of capital intensity on tax avoidance. These results complement previous studies that prove that digitalization makes capital governance better and tax aspects more compliant (Chen et al., 2024; Hai et al., 2024; Lv & Wu, 2024; Xu et al., 2025). Companies that have high or low fixed assets are more likely to implement digitalization to reduce operational costs that were previously used for manual work, so that it will increase profit before tax but not increase tax avoidance. The results of this study are in line with those conducted by Rosyid et al. (2024), Fang et al. (2023), and Xie & Huang (2023) which stated that the moderating role of digital implementation is able to weaken the positive influence of capital intensity on tax avoidance.

Moderation of digital implementation on the influence of firm size on tax avoidance

The results of the hypothesis test prove that the p values are 0.019 < 0.05 and the t value is -2.86 > 1.65, thus indicating the moderation of digital implementation on the influence between firm size and tax avoidance. The results of the study are in accordance with the hypothesis H_6 which states that digital implementation weakens the positive influence of firm size on tax avoidance. The results of this study mean that the interaction between digital implementation and firm size can reduce tax avoidance practices. With the role of digital implementation in companies that have a large number of assets, they are able to invest to improve the quality of more integrated transaction recording. Digital implementation makes it easier to manage finances and taxation for the needs of detailed analysis of the tax structure and the process of identifying legal loopholes in tax regulations to identify tax obligations legally. The results of this study complement the results of studies stating that digitalization will encourage efficiency and transparency in the governance of large assets and reduce the risk of tax fines (Hai et al., 2024; Lv & Wu, 2024; Q. Zhao & Wang, 2025). Through digitalization, it is easier for companies to predict risks related to changes in tax regulations and even help companies take advantage of tax incentives or schemes that are in accordance with policies by utilizing AI and machine learning. Digital implementation helps companies avoid tax avoidance activities. This study is in line with the research of Rosyid et al. (2024), Fang et al. (2023), and Xie & Huang (2023) which stated that the moderating role of digital implementation can influence the positive influence of firm size on tax avoidance.

Determination coefficient and regression equation

The resulting determination coefficient value is 0.208. This means that the ability of financial distress, capital intensity and firm size in explaining tax avoidance, as well as the moderating impact of digital implementation is 26.8%. While the remaining 73.2% is caused by other factors not tested in this study. The resulting regression equation is TA = 0.16 + 0.38 FD + 0.15 CI + 0.19 FS – 0.24 DI * FD – 0.11 DI * CI – 0.13 DI * FS + e. The resulting regression equation informs that the highest direct influence coefficient and its significant influence is only produced by financial distress with a positive or unidirectional influence. This means that every time financial distress increases by 100%, tax avoidance will also increase by 38%. While the significant moderating influence coefficient is the highest produced by the interaction of digital implementation with financial distress. The second order is the interaction of digital implementation with firm size and the third order is the interaction of digital implementation with capital intensity. This means that every time digital implementation increases by 100%, the positive impact of financial distress on tax avoidance will decrease by 24%. Every time digital implementation increases by 100%, the positive impact of capital intensity on tax avoidance will decrease by 11%. Every time digital implementation increases by 100%, the positive impact of firm size on tax avoidance will decrease by 13%. Digital implementation is very effective in reducing tax avoidance actions caused by financial distress, including if tax avoidance is caused by capital intensity and firm size.

5. CONCLUSION

Financial distress has a positive effect on tax avoidance. These results provide an understanding that companies experiencing financial distress tend to do tax avoidance. For tax authorities, this information needs to be known, that companies experiencing financial distress will tend to do tax avoidance. While capital intensity and firm size do not affect tax avoidance. This provides an understanding that the conditions of capital intensity and firm size owned by the company do not encourage tax avoidance or do not have a significant impact on tax avoidance. Digital implementation can weaken the positive impact of financial distress on tax avoidance. When a company experiences financial distress, but digital implementation has been carried out, tax avoidance activities will be significantly reduced. Including if tax avoidance occurs due to factors of capital intensity and firm size, then digital implementation will also be effective in reducing tax avoidance. Digital implementation has been proven effective in reducing tax avoidance in companies. It is very important to recommend that digital implementation be implemented in every company. This will facilitate the supervision of corporate taxation carried out by the tax authority. Digital implementation can contribute significantly to increasing the tax ratio in the future.

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