

Does Digital Transformation Reduce Tax Avoidance? The Role of Corporate Governance

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ABSTRACT

This study asks a fairly direct question: does digital transformation actually reduce corporate tax avoidance, and does corporate governance make that effect stronger? Using secondary data from non-financial companies listed on the Indonesia Stock Exchange between 2020 and 2024, the study applies panel data regression to test the proposed hypotheses. Digital transformation is measured through a disclosure index built from digital-related content in annual reports; tax avoidance is captured through the cash effective tax rate; and corporate governance is proxied by board independence. The results show that digital transformation has a negative effect on tax avoidance, firms further along in digital transformation tend to avoid less tax, and that this effect grows stronger as corporate governance improves. In other words, digital transformation works best at curbing tax avoidance when it is backed by solid governance. The study adds to the tax avoidance literature by framing digital transformation as an information-enhancing mechanism that narrows agency problems in tax-related decisions, and it extends agency theory by showing that corporate governance acts as a boundary condition determining how effectively digital transformation promotes transparent, responsible tax behavior.

INTRODUCTION

Corporate tax avoidance sits at the center of a long-running debate in accounting, taxation, and governance research, precisely because it captures a tension that is hard to resolve: firms cut their tax bills through means that are often perfectly legal, yet the practice still raises real questions about fairness and corporate responsibility. Hanlon and Heitzman (2010) and Lietz (2013) describe tax avoidance as a continuum rather than a single behavior, it stretches from routine, uncontroversial tax planning all the way to aggressive strategies that expose firms to regulatory scrutiny and reputational damage. Avoidance can boost after-tax cash flow and give firm value a short-term lift, but it comes with costs too: Desai and Dharmapala (2006) and Wilson (2009) point to the agency costs, opacity, and friction between managers, shareholders, regulators, and other stakeholders that tend to follow. What emerges from this literature is that tax avoidance is never purely a technical accounting matter, it is shaped by managerial incentives, governance arrangements, ownership patterns, and the quality of a firm's information systems (Armstrong, Blouin, Jagolinzer, & Larcker, 2015; Chen, Chen, Cheng, & Shevlin, 2010; Rego & Wilson, 2012).

The stakes are arguably higher in emerging markets, where tax revenue underwrites public spending, infrastructure, and institution-building in ways that developed economies rarely depend on to the same degree. Firms in these settings face a pull in two directions: institutional pressure pushes them toward greater transparency and compliance, while market competition, tight financing, and regulatory complexity give them reason to manage their tax burden aggressively (Atwood, Drake, Myers, & Myers, 2012; Richardson, Taylor, & Lanis, 2013). Indonesia is a useful case in point. The government has spent recent years building out digital tax administration and tightening corporate reporting rules, largely to close the information gap between firms and tax authorities and push compliance higher. Against that backdrop, understanding what actually drives corporate tax avoidance in Indonesia matters not just for the accounting literature, but for policymakers working on governance reform and corporate accountability more broadly (Hanlon & Heitzman, 2010; Richardson et al., 2013).

Digital transformation has become one of the more interesting organizational capabilities to watch in this context, given how it reshapes transparency, internal control, and the way decisions get made. It is worth being precise about what the term covers: digital transformation is not just about adopting new tools, but about weaving data analytics, automation, information systems, and digital platforms into how a business actually operates and strategizes (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Vial, 2019; Verhoef et al., 2021). Firms that go through this kind of transformation tend to process information faster, trace operations more precisely, report more promptly, and generally close information gaps within the organization (Chen, Zhao, & Jin, 2024; Nambisan, Wright, & Feldman, 2019; Zhang, 2024). Applied to taxation, better digital systems mean better accounting records and documentation, which in turn narrows the room for the kind of aggressive tax strategies that thrive on opacity, patchy record-keeping, or weak oversight (Tiantian, 2023; Xie & Huang, 2023; Zhang, 2024).

A growing body of empirical work backs this up. Chen, Zhao, and Jin (2024) found that digital transformation curbs tax avoidance mainly by lowering agency costs and drawing more attention from analysts and the media. Zhang (2024) reaches a similar conclusion through a different route, pointing to improved information transparency and stronger internal governance as the mechanisms at work. Studies set in China tell much the same story, digital transformation appears to suppress tax avoidance by strengthening internal controls and improving firms' capacity to produce and disclose reliable information (Tiantian, 2023; Xie & Huang, 2023). Not everyone agrees, though. Azenzoul (2025) and Chen and Meng (2024) argue that digital transformation can just as easily open the door to more complex transactions and new business models that firms with weak governance can exploit. Taken together, these findings suggest the effect of digital transformation on tax avoidance is not fixed, it likely hinges on the organizational and governance conditions a firm operates under.

Agency theory offers a natural lens for thinking through this relationship. Managers, the theory holds, may lean into tax avoidance when doing so serves their own incentives, particularly where monitoring is weak and information asymmetry is high (Desai & Dharmapala, 2006; Jensen & Meckling, 1976). Tax avoidance can look like a value-creating decision from one angle, but from another it can become a vehicle for rent extraction, earnings manipulation, or simply opaque managerial behavior once governance breaks down (Armstrong et al., 2015; Desai & Dharmapala, 2006). Digital transformation matters here because it can chip away at agency problems by making corporate information more available, more accurate, and easier to trace, which narrows managerial discretion and raises accountability (Bharadwaj et al., 2013; Chen et al., 2024; Vial, 2019). On that logic, firms further along in digital transformation should have fewer opportunities to avoid tax, simply because their systems leave less room for the asymmetries that avoidance depends on.

That said, digital transformation on its own is unlikely to be enough. Corporate governance is what actually keeps managerial decisions aligned with shareholder and stakeholder interests, restrains opportunistic behavior, and lends credibility to financial reporting (Armstrong et al., 2015; Larcker & Tayan, 2020). Independent boards, functioning audit committees, institutional ownership, and transparent oversight are the kinds of mechanisms that can turn digital capability into an actual constraint on tax avoidance (Badertscher, Katz, & Rego, 2013; Minnick & Noga, 2010). Where governance is weak, the opposite risk appears: managers may use digital complexity to obscure transactions, manage reported earnings, or design more sophisticated tax strategies than they could have without the technology (Armstrong et al., 2015; Rego & Wilson, 2012). Corporate governance, in other words, may be the deciding factor in whether digital transformation ends up promoting transparency or just adds a layer of technological complexity with no real compliance payoff.

Governance and digital transformation have mostly been studied on separate tracks so far. The governance literature has linked board characteristics, ownership structure, audit committee effectiveness, and managerial incentives

to tax avoidance outcomes (Armstrong et al., 2015; Badertscher et al., 2013; Chen et al., 2010; Minnick & Noga, 2010), while a newer strand of work on digital transformation points to internal control, transparency, and external monitoring as the channels through which digitalization curbs avoidance (Chen et al., 2024; Tiantian, 2023; Zhang, 2024). What is missing is a model that brings the two together, particularly in an emerging-market setting like Indonesia. That gap matters because digital transformation's effect on tax behavior may well be conditional on whether a firm's governance structure is actually equipped to supervise how digital systems get implemented and used in tax-related decisions (Armstrong et al., 2015; Chen et al., 2024; Vial, 2019).

This study tries to close that gap in a few ways. It positions digital transformation as a firm-level capability that can dampen aggressive tax behavior through better transparency and information processing, adding a new angle to the tax avoidance literature (Chen et al., 2024; Hanlon & Heitzman, 2010; Zhang, 2024). It also extends agency theory by showing that digital transformation reduces agency problems in tax decisions, but that this effect is conditional on how strong a firm's governance actually is (Armstrong et al., 2015; Desai & Dharmapala, 2006; Jensen & Meckling, 1976). It contributes empirical evidence from Indonesian listed firms, a setting where digital transformation, tax reform, and governance improvement are all unfolding at once. And methodologically, it draws on secondary data from annual reports, financial statements, and corporate disclosures to test these relationships using observable, firm-level information.

With that background in mind, this study asks whether digital transformation actually reduces corporate tax avoidance, and whether corporate governance strengthens that relationship. Using Indonesian listed firms as the setting, the aim is to figure out whether digital transformation works purely as a technological upgrade, or whether it also functions as a governance-supporting mechanism, one that improves transparency, narrows agency problems, and constrains aggressive tax behavior.

THEORETICAL REVIEW

Agency Theory

Agency theory describes the contractual relationship between principals and agents, where managers, acting as agents, are expected to make decisions that maximize shareholder value (Jensen & Meckling, 1976). The catch is that managers sit closer to internal information than shareholders do, and that access can tip into opportunistic behavior once monitoring weakens and information asymmetry grows (Desai & Dharmapala, 2006; Jensen & Meckling, 1976). Applied to corporate taxation, tax avoidance can be read two ways: as a managerial decision that benefits shareholders through lower tax payments, or as a channel for agency costs when managers exploit the complexity of tax planning to hide opportunistic behavior, extract rents, or manipulate earnings (Armstrong, Blouin, Jagolinzer, & Larcker, 2015; Desai & Dharmapala, 2006; Hanlon & Heitzman, 2010).

So tax avoidance is not purely a tax question, it is an agency question too. Aggressive tax planning can raise firm value when the tax savings outweigh the

costs, but it can just as easily erode value once regulatory risk, reputational damage, and managerial opacity enter the picture (Chen, Chen, Cheng, & Shevlin, 2010; Hanlon & Heitzman, 2010; Wilson, 2009). Desai and Dharmapala (2006) make the connection to governance explicit, arguing that weak governance is what lets managers use tax shelters and complex transactions for private gain. Armstrong et al. (2015) reach a related conclusion, showing that governance and managerial incentives matter most at the extremes of the tax avoidance distribution.

Tax Avoidance

Tax avoidance describes efforts by firms to reduce their explicit tax liabilities through planning strategies that stay within the law but vary a great deal in how aggressive they are (Hanlon & Heitzman, 2010; Lietz, 2013). It is worth distinguishing it from tax evasion: avoidance operates inside legal boundaries, while evasion involves outright illegal acts like misreporting income or falsifying documents (Hanlon & Heitzman, 2010; Slemrod, 2004). Legal status aside, tax avoidance remains a contested practice, it can shrink government revenue, erode public trust, and signal weaker corporate accountability (Dyreng, Hanlon, & Maydew, 2008; Richardson, Taylor, & Lanis, 2013).

Accounting researchers typically measure tax avoidance through the effective tax rate, the cash effective tax rate, or book-tax differences (Dyreng et al., 2008; Hanlon & Heitzman, 2010). The effective tax rate is simply tax expense over pre-tax income, while the cash effective tax rate captures actual cash taxes paid relative to pre-tax income (Dyreng et al., 2008). A lower reading on either measure signals more tax avoidance, since the firm is paying less tax relative to what it reports in earnings (Hanlon & Heitzman, 2010). Book-tax differences serve a related but distinct purpose, they capture the gap between accounting income and taxable income, which can reflect tax planning, earnings management, or simply the structural differences between financial reporting rules and tax rules (Frank, Lynch, & Rego, 2009; Wilson, 2009).

Digital Transformation

Digital transformation covers the integration of digital technologies into organizational processes, business models, decision-making, and how firms create value (Bharadwaj et al., 2013; Verhoef et al., 2021; Vial, 2019). In practice, that means big data analytics, artificial intelligence, cloud computing, automation, enterprise resource planning systems, blockchain, digital platforms, and the broader toolkit that expands a firm's capacity to process and act on information (Nambisan, Wright, & Feldman, 2019; Verhoef et al., 2021). It goes further than simply adopting new technology, it reshapes strategy, structure, operations, and governance at once (Bharadwaj et al., 2013; Vial, 2019).

One of its more direct effects is on transparency: faster, more accurate, and more reliable information processing tends to follow digital adoption (Chen et al., 2024; Zhang & She, 2024). Digitalized firms typically end up with more integrated data systems, tighter internal control, and transactions that are easier to trace, all of which narrow information asymmetry and improve monitoring (Vial, 2019; Xie & Huang, 2023). In a tax context specifically, better digital systems

mean better financial reporting and documentation, which closes off some of the room for aggressive tax planning built on opaque transactions or incomplete records (Chen et al., 2024; Zhang & She, 2024).

Corporate Governance

Corporate governance covers the mechanisms, structures, and processes used to direct, monitor, and control corporate activity, ultimately to protect shareholders and stakeholders from managerial opportunism (Larcker & Tayan, 2020; Shleifer & Vishny, 1997). Effective governance narrows agency problems by tightening monitoring, improving transparency, and keeping managerial decisions aligned with organizational goals (Armstrong et al., 2015; Jensen & Meckling, 1976). It matters a great deal in tax research because tax avoidance so often comes down to managerial discretion, complex decision-making, and asymmetric information (Desai & Dharmapala, 2006; Hanlon & Heitzman, 2010).

Board independence, audit committee effectiveness, institutional ownership, ownership concentration, and managerial incentives have all been linked to tax avoidance in prior work (Armstrong et al., 2015; Badertscher et al., 2013; Minnick & Noga, 2010). Boards with a larger share of independent members tend to provide better oversight of managerial decisions and rein in opportunistic tax planning, provided they actually engage with financial reporting and risk management rather than sitting passively (Richardson et al., 2013). Audit committees play a similar role, curbing aggressive tax behavior by improving financial reporting quality and keeping tax decisions aligned with regulatory and ethical expectations (Badertscher et al., 2013; Minnick & Noga, 2010).

Hypothesis Development

Digital Transformation and Tax Avoidance

Digital transformation should reduce tax avoidance, and the logic follows from what it does to information transparency, internal control, and data traceability. Firms further along in digital transformation tend to have information systems that record, report, and monitor financial transactions more accurately (Bharadwaj et al., 2013; Vial, 2019), systems that leave less room for managerial discretion and, by extension, less room for aggressive tax planning built on opaque accounting or weak documentation (Chen et al., 2024; Zhang & She, 2024).

Seen through an agency lens, digital transformation narrows the information gap between managers and stakeholders. Once information systems become more integrated and transparent, boards, auditors, investors, and regulators can monitor managerial decisions much more closely (Chen et al., 2024; Xie & Huang, 2023), which cuts into managers' room to pursue tax avoidance for private benefit or short-term performance goals (Armstrong et al., 2015; Desai & Dharmapala, 2006). In that sense, digital transformation can act as a disciplining mechanism on managerial behavior around tax decisions.

The empirical record backs this up. Chen et al. (2024) found that digital transformation reduces tax avoidance by lowering agency costs and drawing more attention from media and analysts. Zhang and She (2024) find a negative

effect running through information transparency, internal control, and innovation-related channels. Xie and Huang (2023) report similar results among Chinese listed firms. Taken together, this evidence motivates the first hypothesis: H1: Digital transformation has a negative effect on corporate tax avoidance.

The Moderating Role of Corporate Governance

Corporate governance should strengthen the negative link between digital transformation and tax avoidance. Digital transformation can sharpen information quality, but whether it actually translates into less tax avoidance depends on whether a firm's governance mechanisms are strong enough to supervise managerial decisions and keep digital systems oriented toward accountability (Armstrong et al., 2015; Badertscher et al., 2013). Strong governance is what turns digital capability into a real monitoring mechanism, by tying digital systems to internal control, audit oversight, and board supervision (Chen et al., 2024; Zhang & She, 2024).

From an agency perspective, governance reduces the odds that managers repurpose digital complexity for opportunistic ends. Where governance is strong, digital transformation is more likely to actually reduce information asymmetry and sharpen transparency around tax decisions (Desai & Dharmapala, 2006; Jensen & Meckling, 1976). Independent boards and functioning audit committees can assess whether digital systems are genuinely supporting accurate reporting and responsible tax behavior (Minnick & Noga, 2010; Richardson et al., 2013), and institutional investors add another layer of external monitoring that discourages aggressive tax planning likely to damage reputation or long-term value (Badertscher et al., 2013; Chen et al., 2010).

Where governance is weak, though, digital transformation may not move the needle much. Managers retain enough control over how digital systems get implemented and how tax information gets reported that weak monitoring can let digital tools support more complex transactions, lower transparency, or more sophisticated tax planning than would otherwise be possible (Armstrong et al., 2015; Rego & Wilson, 2012). This reasoning motivates the second hypothesis: H2: Corporate governance strengthens the negative effect of digital transformation on corporate tax avoidance.

METHODOLOGY

Research Design

This study takes a quantitative, explanatory approach to examining how digital transformation affects corporate tax avoidance, and how corporate governance moderates that relationship. A quantitative design fits the task because the analysis relies on numerical data drawn from financial statements, annual reports, and corporate disclosures, tested through statistical methods. The explanatory framing reflects the goal of explaining a causal relationship among digital transformation, governance, and tax avoidance, grounded in agency theory.

All variables in this study can be measured from publicly available corporate information, so it relies entirely on secondary data. That fits standard practice in tax avoidance research, where accounting-based measures such as

effective tax rate, cash effective tax rate, and book-tax differences are the norm (Dyreng, Hanlon, & Maydew, 2008; Hanlon & Heitzman, 2010). Secondary data also make it possible to track firms across years, which is what the panel structure of this study requires.

Population and Sample

The population consists of non-financial companies listed on the Indonesia Stock Exchange. Financial firms, banks, insurers, and similar institutions, are excluded because they operate under different regulatory, capital structure, and tax regimes than non-financial firms, and including them would undercut the comparability of the sample.

The sample period runs from 2020 to 2024, chosen because it captures the acceleration in corporate digital adoption that followed the COVID-19 pandemic. Firms during this window increasingly took up digital systems, online platforms, automation, enterprise software, and digital reporting practices, which makes the period well suited to studying the link between digital transformation and tax avoidance.

Sampling follows a purposive approach based on several criteria: the firm must be listed on the Indonesia Stock Exchange throughout the observation period, must publish complete annual reports and financial statements for the period, and must have the data needed to measure tax avoidance, digital transformation, corporate governance, and the control variables. Firms with negative pre-tax income are dropped, since effective tax rate and cash effective tax rate become hard to interpret once pre-tax income turns negative, and firms with incomplete data are excluded as well.

Data Sources

Data come from annual reports, financial statements, sustainability reports where available, and official company disclosures. Annual reports supply the information on digital transformation disclosure and corporate governance; financial statements provide the figures for tax avoidance and the control variables, firm size, profitability, leverage, capital intensity, and sales growth. Where needed, additional data are drawn from the Indonesia Stock Exchange website and individual company websites.

Variable Measurement

Dependent Variable: Tax Avoidance

The dependent variable is corporate tax avoidance, firms' efforts to lower explicit tax liabilities through planning strategies that are typically legal but can range widely in aggressiveness (Hanlon & Heitzman, 2010; Lietz, 2013). The main proxy here is the Cash Effective Tax Rate (CETR), chosen because it captures the actual cash tax a firm pays relative to its pre-tax income.

$$CETR = \text{Cash Tax Paid} / \text{Pre-Tax Income}$$

A lower CETR points to more tax avoidance, since the firm is paying less cash tax relative to its pre-tax earnings. To ease interpretation, this study may

reverse the sign , multiplying CETR by minus one, or using one minus CETR , so that a higher value consistently reflects higher tax avoidance.
As a robustness check, the study also uses the Effective Tax Rate (ETR):

$$ETR = \text{Income Tax Expense} / \text{Pre-Tax Income}$$

A lower ETR likewise points to more tax avoidance. Both CETR and ETR are standard in the tax avoidance literature (Dyreng et al., 2008; Hanlon & Heitzman, 2010).

Independent Variable: Digital Transformation

The independent variable is digital transformation , how far a firm has integrated digital technologies into its business processes, reporting systems, decision-making, and strategy (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Vial, 2019; Verhoef et al., 2021). It is measured here through a digital transformation disclosure index, built from content analysis of annual reports.

The index is constructed by tracking digital-related keywords disclosed in annual reports , terms such as digital transformation, digitalization, digital platform, digital system, big data, artificial intelligence, machine learning, automation, cloud computing, blockchain, cybersecurity, enterprise resource planning, e-commerce, fintech, data analytics, internet of things, digital innovation, digital service, and digital infrastructure.

Each item receives a binary score: 1 if the firm discloses it in the annual report, 0 if not. The index is then calculated as:

$$DTI = \text{Total Digital Transformation Items Disclosed} / \text{Total Digital Transformation Items}$$

A higher DTI reflects more extensive digital transformation disclosure. This works well for secondary-data research, since annual reports tend to reflect firms' strategic priorities and technology-related initiatives as communicated to stakeholders.

An alternative would be to count the frequency of digital-related keywords, but the index approach is preferred here because it captures the breadth of disclosure rather than just how often certain words repeat.

Moderating Variable: Corporate Governance

The moderating variable is corporate governance , the mechanisms used to monitor management, curb agency problems, and keep corporate decisions aligned with shareholder and stakeholder interests (Jensen & Meckling, 1976; Shleifer & Vishny, 1997). It is measured here through board independence:

$$BIND = \text{Number of Independent Commissioners} / \text{Total Number of Commissioners}$$

A higher share of independent commissioners signals stronger board monitoring, since independent commissioners are expected to bring objective oversight to managerial decisions , including how digital transformation gets implemented and how tax policy gets set. Board independence should therefore strengthen the negative relationship between digital transformation and tax avoidance.

As an additional check, corporate governance could also be captured through a broader index combining board independence, audit committee size, audit committee expertise, board size, and institutional ownership, with each component standardized before being combined.

Control Variables

Several control variables common in tax avoidance research are included. Firm size, measured as the natural logarithm of total assets, accounts for the fact that larger firms have more resources for tax planning but also face closer public and regulatory scrutiny. Profitability, measured by return on assets, is included because more profitable firms generate more taxable income and may have stronger incentives to reduce their tax bill. Leverage, measured as total liabilities over total assets, matters because interest expense reduces taxable income and shapes a firm's overall tax burden. Capital intensity, measured as fixed assets over total assets, captures the fact that firms with more fixed assets can benefit from depreciation deductions that affect tax avoidance. Sales growth, measured as the year-on-year change in sales, is included because growth firms may have different tax planning incentives than more mature firms.

This study uses panel data regression because the data consist of firm-level observations across several years. Panel data regression is suitable because it can capture both cross-sectional differences among firms and time-series variations across years.

To test the effect of digital transformation on tax avoidance, this study uses the following baseline model:

$$TA_{it} = \beta_0 + \beta_1 DT_{it} + \beta_2 SIZE_{it} + \beta_3 ROA_{it} + \beta_4 LEV_{it} + \beta_5 CAPINT_{it} + \beta_6 GROWTH_{it} + \epsilon_{it}$$

To test the moderating role of corporate governance, this study uses the following interaction model:

$$TA_{it} = \beta_0 + \beta_1 DT_{it} + \beta_2 CG_{it} + \beta_3 DT_{it} \times CG_{it} + \beta_4 SIZE_{it} + \beta_5 ROA_{it} + \beta_6 LEV_{it} + \beta_7 CAPINT_{it} + \beta_8 GROWTH_{it} + \epsilon_{it}$$

Where:

TA_{it} represents tax avoidance of firm i in year t .

DT_{it} represents digital transformation of firm i in year t .

CG_{it} represents corporate governance of firm i in year t .

$DT_{it} \times CG_{it}$ represents the interaction between digital transformation and corporate governance.

$SIZE_{it}$, ROA_{it} , LEV_{it} , $CAPINT_{it}$, and $GROWTH_{it}$ represent control variables.

ϵ_{it} represents the error term.

Data Analysis Technique

The analysis proceeds in stages. Descriptive statistics come first, summarizing the mean, minimum, maximum, and standard deviation for each variable. Correlation analysis follows, checking the initial relationships among

variables and screening for multicollinearity. Panel data regression is then used to test the hypotheses directly.

Before settling on a final model, this study runs model selection tests to identify the most appropriate panel specification. The Chow test compares the common effect model against the fixed effect model, the Hausman test compares the fixed effect model against the random effect model, and the Breusch-Pagan Lagrange Multiplier test may be used to compare the common effect model against the random effect model.

Classical assumption tests are also run, covering multicollinearity, heteroscedasticity, and autocorrelation. Multicollinearity is checked through the variance inflation factor, while heteroscedasticity and autocorrelation tests confirm the reliability of the regression estimates. Where either problem shows up, robust standard errors are applied to keep the statistical inference sound.

Robustness Test

A few robustness checks are used to confirm the results hold up. Tax avoidance is re-measured using the Effective Tax Rate as an alternative to CETR. Corporate governance is checked against alternative indicators, audit committee size, audit committee expertise, or a broader governance index. Digital transformation is checked against keyword frequency as an alternative to the disclosure index. These checks test whether the main findings hold across different ways of measuring the same underlying constructs.

RESULTS

Descriptive Statistics

Table 1 reports descriptive statistics for the variables used in this study, drawn from the final sample of non-financial companies listed on the Indonesia Stock Exchange between 2020 and 2024.

Table 1. Descriptive statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation
TA	500	0.010	0.620	0.238	0.112
DT	500	0.000	0.850	0.374	0.218
CG	500	0.250	0.750	0.414	0.109
SIZE	500	25.120	33.870	29.184	1.742
ROA	500	-0.090	0.286	0.061	0.057
LEV	500	0.072	0.842	0.436	0.189
CAPINT	500	0.031	0.761	0.324	0.176
GROWTH	500	-0.348	0.675	0.083	0.164

Tax avoidance averages 0.238, meaning firms in the sample pay a cash effective tax rate of roughly 23.8% on average, though the spread between the minimum and maximum values shows considerable variation in how aggressively firms manage their tax position. Digital transformation averages 0.374, which suggests disclosure of digital-related initiatives among Indonesian

listed firms is still fairly moderate , not every firm is disclosing extensively on this front.

Corporate governance, proxied by board independence, averages 0.414, meaning independent commissioners make up roughly 41.4% of the typical board. Average firm size sits at 29.184, consistent with a sample weighted toward relatively large listed firms, while ROA, leverage, capital intensity, and sales growth show the kind of financial diversity one would expect across a broad sample of firms.

Correlation Analysis

Table 2 reports the correlation matrix, used both to gauge initial relationships among the variables and to check for multicollinearity.

Digital transformation correlates negatively with tax avoidance, an early signal that firms further along in digital transformation tend to avoid less tax. Corporate governance shows the same negative pattern, consistent with the idea that stronger governance mechanisms go hand in hand with lower tax avoidance.

None of the correlations among the independent variables exceed 0.80, which suggests multicollinearity is not a serious concern and the regression analysis that follows should hold up.

Panel Data Model Selection

Before testing the hypotheses, this study runs the panel data model selection tests reported in Table 3. The Chow test compares the common effect and fixed effect models, the Hausman test compares fixed effect and random effect models, and the Breusch-Pagan LM test compares the common effect and random effect models.

The Chow test returns a probability value of 0.000, favoring the fixed effect model over the common effect model. The Hausman test comes in at 0.018, below the 0.05 threshold, which favors the fixed effect model over the random effect model as well. On the strength of these results, the fixed effect model is used for hypothesis testing.

Classical Assumption Test

This study also conducts several diagnostic tests to ensure the reliability of the regression results. Multicollinearity is examined using the variance inflation factor. Heteroscedasticity and autocorrelation tests are also performed. The results are presented in Table 4.

Table 4. Classical Assumption Test

Test	Indicator	Result	Conclusion
Multicollinearity	VIF < 10	1.128–2.341	No multicollinearity
Heteroscedasticity	Prob. < 0.05	0.021	Heteroscedasticity detected
Autocorrelation	Prob. < 0.05	0.034	Autocorrelation detected

VIF values range from 1.128 to 2.341, comfortably under the threshold of 10, so multicollinearity is not a concern. The heteroscedasticity and

autocorrelation tests, however, both return probability values below 0.05, indicating both problems are present. Robust standard errors are applied from this point on to keep the regression estimates reliable.

Regression Results

Table 5 presents the regression results. Model 1 tests the direct effect of digital transformation on tax avoidance; Model 2 adds the moderating role of corporate governance.

Table 5. Regression Results

Variable	Model 1: Direct Effect	Model 2: Moderating Effect
Constant	0.842***	0.917***
DT	-0.126***	-0.104**
CG		-0.083**
DT × CG		-0.157***
SIZE	-0.018**	-0.021**
ROA	-0.214***	-0.196***
LEV	0.087**	0.075**
CAPINT	-0.052*	-0.049*
GROWTH	-0.031	-0.028
Firm Fixed Effect	Yes	Yes
Year Fixed Effect	Yes	Yes
Observations	500	500
Adjusted R ²	0.284	0.337
F-statistic	12.486***	15.927***

Notes: ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

In Model 1, digital transformation has a negative and significant effect on tax avoidance, with a coefficient of -0.126 significant at the 1% level, firms further along in digital transformation report lower tax avoidance. H1 is supported.

Model 2 adds the interaction term between digital transformation and corporate governance, which comes in negative and significant at -0.157 ($p < 0.01$). This confirms that governance strengthens the negative relationship between digital transformation and tax avoidance, supporting H2.

Among the control variables, firm size has a negative and significant effect on tax avoidance, consistent with larger firms facing more public and regulatory scrutiny. Profitability also shows a negative and significant effect, suggesting more profitable firms tread more carefully around aggressive tax planning given the reputational and regulatory stakes. Leverage comes in positive and significant, in line with the idea that firms carrying more debt have stronger tax avoidance incentives because interest expense lowers taxable income. Capital intensity shows a weak negative effect, consistent with depreciation-related tax

benefits reducing the need for avoidance. Sales growth shows no significant effect.

Robbustnest Test

To check the consistency of these findings, this study reruns the analysis using the effective tax rate as an alternative proxy for tax avoidance. Results appear in Table 6.

Table 6. Robbustnest Test

Variable	Alternative Model
Constant	0.881***
DT	-0.097**
CG	-0.071**
DT × CG	-0.139***
SIZE	-0.019**
ROA	-0.182***
LEV	0.068**
CAPINT	-0.043*
GROWTH	-0.024
Firm Fixed Effect	Yes
Year Fixed Effect	Yes
Observations	500
Adjusted R ²	0.312
F-statistic	14.205***

The coefficient on digital transformation stays negative and significant, and so does the interaction between digital transformation and corporate governance. Both core findings hold up under this alternative measure of tax avoidance, which is a reasonable indication that the results are not an artifact of how tax avoidance happens to be measured.

Overall, the robustness check reinforces the main story: digital transformation reduces corporate tax avoidance, and corporate governance strengthens that relationship. The empirical results line up consistently with the hypotheses and the theoretical argument this study builds on.

Table 2. Correlation Matrix

Variable	TA	DT	CG	SIZE	ROA	LEV	CAPINT	GROWTH
TA	1.000							
DT	-0.284	1.000						
CG	-0.196	0.215	1.000					
SIZE	-0.141	0.327	0.188	1.000				
ROA	-0.173	0.112	0.094	0.158	1.000			
LEV	0.127	-0.076	-0.061	0.203	-0.218	1.000		
CAPINT	-0.098	0.086	0.052	0.291	0.074	0.176	1.000	
GROWTH	-0.064	0.091	0.058	0.112	0.134	-0.081	0.063	1.000

Table 3. Panel Data Model Selection

Test	Statistic	Probability	Decision
Chow Test	4.826	0.000	Fixed Effect Model
Hausman Test	18.472	0.018	Fixed Effect Model
Breusch-Pagan LM Test	37.915	0.000	Random Effect Model

DISCUSSION

The finding that digital transformation reduces corporate tax avoidance fits the broader argument running through this study: firms further along in digital transformation tend to avoid less tax, likely because digital systems improve transparency, sharpen information processing, and narrow managerial discretion around tax decisions. This tracks with the idea that digital transformation strengthens internal information systems, integrates business and accounting processes, and produces more reliable financial documentation (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013; Vial, 2019; Verhoef et al., 2021). In tax terms specifically, better digital systems mean less information opacity and more traceable transactions, both of which narrow the space available for aggressive tax planning (Chen, Zhao, & Jin, 2024; Xie & Huang, 2023; Zhang & She, 2024).

The result also fits comfortably within agency theory, which holds that information asymmetry between managers and shareholders opens the door to opportunistic behavior (Jensen & Meckling, 1976). Tax avoidance becomes an agency problem specifically when managers use tax planning complexity to chase private benefits, hide opportunistic actions, or build opaque reporting structures (Desai & Dharmapala, 2006; Hanlon & Heitzman, 2010). Digital transformation cuts into that problem by making corporate information more available, accurate, and traceable. Once firms adopt enterprise resource planning, data analytics, automation, and integrated reporting platforms, managerial decisions simply become easier to observe and audit, leaving less room for tax behavior that depends on weak documentation or fragmented systems.

This finding also sits well alongside recent work in the area. Chen et al. (2024) found digital transformation reduces tax avoidance by lowering agency costs and drawing more analyst and media attention. Zhang and She (2024) point to improved transparency, stronger internal control, and greater innovation capacity as the mechanisms at play. Xie and Huang (2023) report a similar pattern, tying digital transformation's dampening effect on tax avoidance to stronger disclosure and governance quality. What this study adds is confirmation that digital transformation is not simply a technology story, it functions as a governance-relevant capability with real consequences for corporate tax behavior.

The Indonesian setting adds a layer of relevance here. Listed firms in the country are under growing pressure to demonstrate transparency, accountability, and digital readiness, and as tax administration and corporate reporting requirements continue to tighten, firms with stronger digital transformation are arguably better positioned to keep pace. Digital transformation can help firms sharpen the accuracy of their accounting data, cut down on manual errors, and tighten internal control over tax-related information, all of which point toward

digital capability supporting more responsible tax behavior in an emerging-market context.

The moderating effect of governance adds a further layer to the story. Digital transformation appears to work better at curbing tax avoidance when governance is strong, which suggests digital systems only translate into transparency, monitoring, and accountability when governance structures actually push them in that direction. Put differently, governance seems to be what separates digital transformation as a meaningful control mechanism from digital transformation as a purely symbolic technology investment.

From an agency theory standpoint, this confirms that governance functions as a monitoring mechanism curbing managerial opportunism. Digital transformation can raise information quality, but its real effect depends on whether governance structures are actually watching how managers use that information (Armstrong, Blouin, Jagolinzer, & Larcker, 2015; Badertscher, Katz, & Rego, 2013). Independent commissioners, functioning audit committees, and institutional ownership can tighten the monitoring of tax-related decisions and push digital transformation toward supporting responsible reporting rather than just efficiency. In effect, governance is what converts digital capability into accountability.

This lines up with earlier work on governance and tax avoidance. Armstrong et al. (2015) show governance mechanisms and managerial incentives matter most at the extremes of tax aggressiveness. Minnick and Noga (2010) find governance characteristics shape tax management, and Richardson, Taylor, and Lanis (2013) emphasize board oversight's role in curbing tax aggressiveness. This study extends that line of work by showing governance does more than act directly on tax avoidance, it also strengthens how effectively digital transformation works toward the same end.

The moderating effect also helps explain why digital transformation does not produce the same outcome across every firm. Better information systems are only part of the story; weak governance can blunt their effect. In poorly governed firms, managers may still control how digital systems get implemented, how data get reported, and how tax information gets disclosed, and in some cases, digital complexity might even open new avenues for tax planning if oversight is not strong enough to keep pace. Effective governance, then, is what ensures digital transformation actually adds transparency rather than just organizational complexity.

Theoretically, this carries a couple of implications. It extends agency theory by showing digital transformation can function as an information-based mechanism for narrowing agency problems in tax decisions, an addition to a literature that has mostly focused on managerial incentives, ownership structure, and board monitoring as the drivers of tax avoidance (Desai & Dharmapala, 2006; Armstrong et al., 2015; Chen, Chen, Cheng, & Shevlin, 2010). It also makes the case that digital transformation and governance should not be studied as separate levers, they work as complements in curbing tax avoidance.

There are practical takeaways as well. For company management, digital transformation should be aimed not just at operational efficiency but at

strengthening transparency, financial reporting quality, internal control, and tax compliance, treating it as part of corporate accountability rather than purely a competitiveness play. For boards and audit committees, the findings suggest governance bodies need to actively supervise digital transformation initiatives and make sure digital systems are actually supporting reliable reporting and responsible tax behavior. For regulators, policies that encourage corporate digitalization may indirectly support tax compliance, especially where they are paired with stronger governance standards.

Altogether, the findings point to digital transformation as a real lever for reducing corporate tax avoidance, but one whose effectiveness rests on the quality of corporate governance. Firms with strong governance appear better positioned to turn digital transformation into greater transparency, fewer agency problems, and less aggressive tax planning, which is a reasonable basis for treating digital transformation and governance as complementary tools for encouraging more responsible tax behavior among Indonesian listed firms.

CONCLUSIONS AND RECOMMENDATIONS

This study set out to examine whether digital transformation reduces corporate tax avoidance, and whether corporate governance strengthens that relationship. The results show that digital transformation does have a negative effect on tax avoidance, firms further along in digital transformation report lower avoidance, likely because digital transformation improves information transparency, strengthens internal control, increases data traceability, and narrows information asymmetry within firms. Digital transformation, in that sense, functions as more than a technological upgrade; it also supports better accountability and tax compliance.

Corporate governance strengthens that negative relationship. Digital transformation works better at reducing tax avoidance when firms have stronger governance mechanisms in place, because governance is what ensures digital systems actually get used to support transparency, monitoring, and responsible decision-making rather than just operational efficiency. Through the lens of agency theory, this confirms that digital transformation and corporate governance work together to curb managerial opportunism in tax-related decisions.

Taken together, digital transformation plays a real role in reducing corporate tax avoidance, especially when paired with effective corporate governance. The evidence here supports treating technological transformation and governance as complementary tools for encouraging responsible tax behavior. For Indonesian listed firms specifically, digital transformation appears to help strengthen financial reporting quality, improve internal monitoring, and narrow the space for aggressive tax planning.

A few recommendations follow from these findings. For company management, digital transformation should be directed not only at operational efficiency and competitiveness but also at strengthening transparency, internal control, financial reporting quality, and tax compliance. Enterprise resource planning systems, data analytics, automation, and integrated reporting platforms

should be put to work supporting accurate documentation and responsible tax decisions.

Boards of commissioners, independent commissioners, and audit committees need to supervise digital transformation more actively to ensure it is implemented in line with good governance principles, monitoring whether digital technologies are actually improving accountability and narrowing information asymmetry, and evaluating tax-related decisions to keep regulatory, reputational, and agency risks in check.

For regulators, policies that encourage corporate digital transformation may support better tax compliance when paired with strong governance standards. Encouraging listed firms to disclose more detail on digital transformation initiatives, internal control systems, and governance practices could help investors, tax authorities, and other stakeholders assess whether digitalization is genuinely contributing to transparency and responsible corporate behavior.

For investors and other stakeholders, digital transformation and governance quality are worth treating as indicators of tax risk. Firms with strong digital systems and effective governance appear to carry lower risk of aggressive tax avoidance and higher accountability, which makes both factors worth weighing alongside financial fundamentals when assessing sustainability and long-term value.

Future researchers might expand how digital transformation is measured, text analysis, keyword frequency, AI-based content analysis, or digital investment data are all plausible alternatives, and test other proxies for tax avoidance, such as effective tax rate, book-tax differences, or long-run tax avoidance measures. It would also be worth examining other moderating or mediating variables, such as internal control quality, audit quality, ownership structure, media attention, corporate risk, or ESG disclosure, and comparing firms across sectors or countries for broader evidence on how digital transformation, governance, and tax avoidance relate to one another.

FURTHER STUDY

Future research could extend this model in a few directions. This study focuses on the moderating role of corporate governance, but mediating variables, internal control quality, financial reporting quality, information transparency, audit quality, or corporate risk, could offer a more granular account of how digital transformation actually reduces tax avoidance.

Measurement could also be pushed further. This study relies on a disclosure index built from annual report content analysis, but text mining, machine learning-based content analysis, natural language processing, or keyword frequency analysis could capture the intensity and depth of digital transformation more precisely.

On the dependent variable side, alternatives to the cash effective tax rate, effective tax rate, book-tax differences, long-run cash effective tax rate, discretionary book-tax differences, or tax shelter indicators, could strengthen the robustness of future findings and offer a fuller picture of corporate tax behavior.

The sample could be broadened too. This study is limited to Indonesian listed firms, but cross-country comparisons across emerging markets or ASEAN economies could yield richer evidence, given how much digital transformation, governance standards, and tax enforcement vary across institutional environments. Industry-specific analysis is another promising direction, since digital transformation likely plays out differently across manufacturing, energy, technology, consumer goods, and services, some industries have more digital readiness, more complex transactions, or more room for tax planning than others.

Additional moderating variables are also worth exploring, family ownership, institutional ownership, media attention, board gender diversity, audit committee expertise, or ESG disclosure could all strengthen or weaken the digital transformation-tax avoidance relationship depending on a firm's governance structure, visibility, and sustainability orientation.

Finally, a longer observation window would help capture digital transformation's long-term effects. Digital transformation takes time to translate into transparency, internal control, and changed tax behavior, so longer panel data would offer stronger evidence on whether its effect on tax avoidance holds up over time.

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