Effect of Financial Distress on Tax Avoidance: A Random Effect Panel Regression Study

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Abstract:

This study investigates the influence of financial distress on tax avoidance of manufacturing firms in South Wollo, Ethiopia, utilizing panel data. 49 companies were chosen by stratified and purposive sampling techniques. The analysis exploits secondary data obtained from the financial statements and annual reports of manufacturing firms. The study employed descriptive statistics and a random effects regression model to achieve its aims. The findings reveal that financial distress, along with profitability, sales growth, and solvency, has a statistically significant negative effect, whereas liquidity, efficiency, and leverage have a statistically significant positive impact. These results suggest that tax authorities should crack down harder and conduct focused audits on companies that are highly liquid, efficient, and leveraged, as they are more susceptible to tax avoidance, and they should also work to improve their risk-based assessment models to identify aggressive tax methods.

Key words*:* Financial distress; tax avoidance; random effect; mixed use; manufacturing companies.

1. Introduction

1.1. Background of the study

Financial distress, often well-defined by a company's inability to meet debt obligations or sustain sufficient liquidity, often indicates a pivotal moment in its existence. This hazardous situation restricts access to external financing, heightens the risk of insolvency, and imposes considerable pressure on management to adopt internal survival strategies. A notable method is tax avoidance, the lawful manipulation of financial and accounting practices to

lessen tax liabilities. In the present volatile economic climate, financial distress has become increasingly relevant, as it is characterized by a business's failure to comply with its financial commitments. A firm is generally deemed to be in financial distress when its cash inflows are inadequate to meet its daily operational expenses [1]. One of the inevitable issues during financial difficulty is taxation. Large businesses may utilize many ways to improve cash flow and sustain solvency to mitigate financial challenges. One such technique is tax avoidance, wherein firms employ aggressive yet lawful strategies to minimize the burden of taxes and to safeguard their wealth. Firms in financial trouble frequently employ diverse tactics to mitigate their tax obligations.

Tax avoidance refers to the practice whereby individuals or entities organize their financial affairs within the bounds of the law to minimize their tax liabilities. This is typically accomplished by exploiting loopholes or shortcomings in tax legislation. According to [2], tax avoidance refers to the reduction of one's tax liability by lawful methods and tax planning techniques that exploit loopholes or contradictions in tax legislation. Financially distressed companies are more actively involved in mitigating their tax burdens to achieve better short-term results. Organizations experiencing financial difficulties tend to adopt strategies designed to reduce tax liabilities, thereby enhancing their short-term liquidity and improving overall financial performance [3]. Companies in distress frequently encounter liquidity issues and may attempt to preserve cash by minimizing their tax obligations through lawful or aggressive tax approaches.

Previous studies indicate that companies experiencing financial distress tend to be motivated to minimize tax burdens to enhance short-term cash flow and financial performance indicators [3]. Thus, tax avoidance can help businesses stay alive by letting them move resources to important tasks. It is vital for policymakers and tax authorities to comprehend this link, as it demonstrates the influence of economic restraints on business tax strategy. This study seeks to examine the impact of financial distress on tax avoidance amid manufacturing companies in the South Wollo District, Ethiopia.

2. Literature review

2.1. Overview of Financial distress and tax avoidance

Financial distress and tax avoidance remain closely interconnected. The signs of financial crisis often become pronounced when tax obligations are evaded. Numerous studies have consistently demonstrated the relationship between financial distress and tax avoidance. The study by [4] posited that there is a

positive association between financial distress and tax avoidance. Prior literature also indicates that struggling enterprises commonly employ aggressive tax techniques to preserve liquidity and avoid default. [5], [6] present foundational findings, framing tax avoidance as a managerial tool that can boost corporate value while concealing opportunistic activity. According to the trade-off theory [7] states that businesses experiencing financial difficulties have a greater willingness to use debt and tax avoidance tactics to increase their tax shields.

Particularly during the Global Economic downturn, [4] discovered a strong favorable link between tax avoidance and financial distress. Additional research by [8], found that tax delay is more commonly used by financially strained enterprises to generate internal cash flow. Similar conclusions were drawn by [8]and [9], who showed that companies with unpredictable situations or limited liquidity are more likely to avoid paying taxes. Other studies also observed this pattern, were financial difficulty significantly increased tax avoidance.
[10] discovered that despite the restricted opportunities, distraught firms in 32 countries increased their tax evading amid the COVID-19 pandemic. Globally, [11] noting these findings by observing an increase in crisis avoidance. Though [12] warn that extremely harsh tax tactics might raise default risks in growth enterprises, tax planning, as revealed by [13] and [14], can provide significant liquidity buffers for distressed firms. While [15] revealed that excessive tax avoidance raises the probability of stock market collapses, [16] found that it also increases the risk of bankruptcy.
Study on the correlation between tax avoidance and financial hardship has shown contradictory but revealing results from a number of research. According to [5], companies that are struggling financially often resort to aggressive tax planning in order to control their cash flow and achieve their performance goals. [17] agency theory is consistent with this, positing that managers may reduce their tax responsibilities to preserve resources when they are financially strapped. Firms that are subject to activist investors' pressure often resort to more tax avoidance in order to boost their short-term performance, as demonstrated by [17].
Alternatively, according to panel data from Australian enterprises analyzed by [18], tax avoidance may be reduced by financially troubled companies as a result of increased scrutiny and concerns about their reputation. It is clear from these differences that institutional and contextual variables play a significant role in determining how corporations pay taxes. Notwithstanding these divergent viewpoints, the research as a whole indicates a subtle but discernible correlation between financial hardship and tax evasion, highlighting

the necessity for additional empirical study, especially in diverse regulatory and economic contexts. This study enhances the existing body of information by analyzing the link within the setting of Ethiopia.

2.2. Theoretical review

Pecking Order Theory: The pecking order theory posits that businesses choose internal funding in order to prevent information asymmetry and expensive external financing. Financial hardship frequently restricts access to outside funding, forcing businesses to rely on debt that offers tax benefits through interest deductions. Companies in financial distress might use more aggressive tax avoidance tactics to protect liquidity and prevent bankruptcy, or they might use more leverage to lower tax obligations. However, high debt limits tax avoidance behavior by raising the risk of distress [18].

Trade-Off Theory: According to this theory, companies evaluate the tax advantages associated with debt in relation the financial trouble they expect to face. When a business is in financial trouble, the cost of debt and the risk of bankruptcy go up. This may make the company less likely to use leverage to avoid paying taxes. The theory postulates that businesses that are in trouble may try to avoid paying taxes aggressively to increase their after-tax cash flows, but they can't because the costs of being in trouble are greater than the benefits of avoiding more taxes [19].

Resource Dependence Theory: According to resource dependency theory, businesses rely on outside parties for resources, such as creditors and tax authorities. These resource flows are threatened by financial distress, which forces businesses to strategically manage their relationships. In order to preserve or enhance their financial performance and, consequently, their access to outside resources, businesses may resort to tax avoidance. The theory emphasizes how strategically tax avoidance can be used to acquire resources and survive in times of financial hardship [20].

Resource-Based View (RBV): According to the resources-based view, tax avoidance skills are unique, valuable, and scarce resources that give businesses a competitive edge, particularly during hard times. Businesses that use savvy tax planning techniques can mitigate the effects of financial hardship by lowering tax payments and increasing cash flows. As a result, financial difficulty motivates enterprises to utilize tax avoidance tactics to increase performance and survival [21].

2.3. Empirical review and Hypothesis

2.3.1. Financial distress and tax avoidance

Companies are often under pressure to reduce costs and improve their immediate financial performance during periods of fiscal difficulty. Tax avoidance is an approach utilized through firms to lessen their tax obligations. Numerous studies indicate a strong correlation between financial difficulty and tax avoidance activity, especially in environments characterized by resource restraints. Companies worldwide, confronted with financial difficulties, were increasingly inclined to engage in tax avoidance. For instance, In Vietnam, financially troubled businesses, particularly small or highly leveraged businesses, avoided taxes more frequently [22]. Besides, tax avoidance was more prevalent among companies in financial distress, and this trend intensified amid the course of the global financial meltdown [4]. This implies a positive relationship between financial distress and tax avoidance.

Liquidity and tax avoidance: Liquidity denotes a company's capacity to settle its current liabilities by utilizing the assets that it already possesses. The company's ability to swiftly, effectively, and economically transform assets into cash without adversely impacting the value of those assets is crucial. A significant number of companies engage in tax avoidance during times of crisis to preserve their cash reserves and meet their short-term obligations when resources are limited. When businesses have a limited amount of cash on hand, they are more likely to avoid paying their taxes. A significant number of scholars have investigated the intricate nature of the interaction that exists between the two. [23], [24] discovered that there is an inverse relationship between tax avoidance and company liquidity. The study conducted by (Chen et al., 2019) also reveals that stock liquidity alleviates severe tax avoidance.

Profitability and tax avoidance: The extent to which a company generates earnings relative to its revenue, assets, or equity, exhibiting operational effectiveness. More lucrative firms have greater ability and reason to participate in tax avoidance, utilizing structures to conceal earnings. It is clear that extremely successful businesses would never dare use tax avoidance. However, the majority of higher-income businesses today try to mitigate their tax liabilities by using a number of tax planning strategies. Certain research implies a negative correlation between tax avoidance and profit generation. As a result, profit-generating businesses may forsake aggressive tax strategies to preserve their reputation.[26] offers a thorough analysis, indicating that more profitable companies, particularly major public enterprises, may encounter increased oversight and hence refrain from aggressive tax planning to save

their reputations. According to [27], The study revealed that more profitable companies are less likely to evade taxes. This lends credibility to the idea that economically successful businesses avoid tax aggressiveness in order to preserve the integrity of their brand.[24], [28] have identified a negative correlation between profitability and tax avoidance.

Efficiency and tax avoidance: Reflects the manner in which a given firm manages its resources, like inventories, receivables, and assets to bring in sales or income. Due to concerns regarding their reputation or their dedication to sustainability and long-term compliance, more efficient enterprises may avoid aggressive tax methods. This idea supported by the research [29], who found that Firms that exhibit greater efficiency and transparency are less likely to undertake tax-related risks, as they seek to preserve their reputation and maintain the trust of their stakeholders.

Solvency and tax avoidance: It is a sign of a business's ability to fulfil its financial obligations over the years and sustain its operations. In the study [30] discovered a favorable and statistically significant association between solvency and tax avoidance. Besides, [31] noticed that solvency has a positive but insignificant impact on tax avoidance.

Leverage and tax avoidance: The utilization of borrowed funds within a company's capital structure to finance assets and operations, which may provide benefits while also posing financial risks. A leveraged business possesses an increased likelihood of avoiding taxes, as the employment of debt financing offers a valid justification and means for achieving this within legal parameters.[32] af firmed that leverage affect tax avoidance positively.

Firm size and tax avoidance: The scale of a firm assessed by parameters like total assets, revenue, or number of employees. Large businesses typically possess more intricate operations and greater financial resources for strategic tax planning, enabling them to establish various loopholes to avoid the taxes. Large firms often evade substantial tax liabilities due to their greater financial resources and workforce. This enables them to employ the most proficient tax professionals, accountants, and attorneys adept in devising intricate tax evasion strategies. Tax authorities encounter greater difficulty in detecting or investigating doubtful actions when large companies possess complicated financial systems. This statement supported by the study conducted[27], who found a positive association between firm size and tax avoidance

Company age and tax avoidance: The duration since a company's establishment or incorporation. Aged companies may exhibit more stable cash flows, superior brand awareness, and management that is less inclined to

engage in risk-taking. To conserve stakeholders' trust, they may refrain from employing aggressive tax avoidance strategies [33]. Emerging enterprises, particularly startups, may attempt to evade tax obligations to navigate financial difficulties during periods of insufficient resources [34].

Sales growth and tax avoidance: The percentage growth in income during a specific period, commonly computed year-over-year. Companies experiencing quicker sales growth and generate higher profits avoid higher tax liabilities due to attract increased scrutiny from tax authorities, investors, and other significant stakeholders. Consequently, they are more tempted to prioritize transparency and adherence to regulations to protect their public reputation and satisfy investors. Somehow, more sales mean more open accounting, which makes it harder to avoid paying taxes aggressively. Thus, high-growth firms frequently must adhere to more tough regulations for financial reporting to keep pace with their accounting transparency. This idea is supported by the research [35], [36] which has found that sales growth statistically negatively affects tax avoidance.

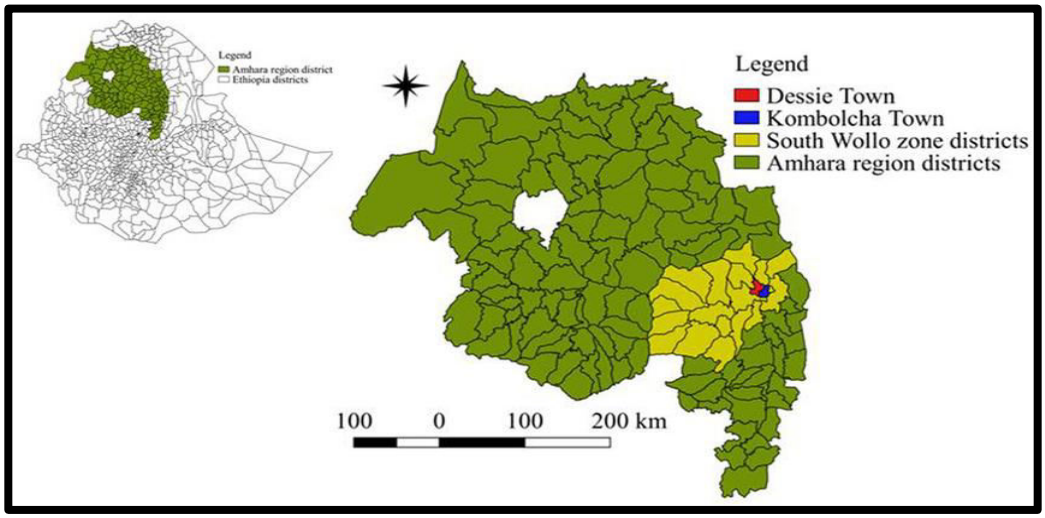
Based on the above evidence and all else **being equal**, this study proposes the following hypothesis:

H: Financial distress is positively linked with tax avoidance.

3. Methodology

3.1. Description of the study area

The study was undertaken in the South Wollo District. It is located in the northeastern part of Ethiopia, within the Amhara Region.



Fig; 1 Map of South Wollo (Sources; South Wollo District Office), 2025

It is bordered to the south by North Shewa and the Oromia Special Zone, to the west by East Gojjam, to the northwest by South Gondar, to the north-by-North Wollo, to the northeast by the Afar Region, and to the east by the Oromia Special Zone and the Argobba Special Woreda. The zone's highest point is Mount Amba Ferit. South Wollo Zone in Ethiopia hosts a growing number of manufacturing companies, particularly in its urban centers like Kombolcha and Dessie. These cities are becoming hubs for various industries, including textiles and garments, beverages, processed foods, wood and furniture, metal and steel, leather and footwear, and construction materials.

3.2. Materials and methods

This study investigated the impact of financial distress on tax avoidance among manufacturing firms in South Wollo District, Ethiopia, during the period from 2020 to 2024. A mixed sampling strategy was employed, which comprised both stratified and purposive sampling methods. The companies were categorized into seven distinct strata, with seven firms from each industry selected purposely. In total, 49 firms were chosen from a pool of 102 audited manufacturing companies for the years 2020 to 2024.The investigation used secondary data gleaned from audited financial statements and annual reports. A longitudinal (panel data) approach was employed to examine variations across time and among entities.

3.3. Methods of data analysis

The study utilized descriptive statistics and econometric models to run the data. Descriptive statistics demonstrated by using mean, maximum, minimum and standard deviation. Various tests were employed to validate the model fitness. After running both the fixed effect (FE) and random effect (RE) models through the Hausman test, we found that the RE model was more suitable for our investigation with a P-value of 0.5483. The researcher has undertaken various tests to assess model fitness. Refer to the Appendix for further details

3.4. Variables and operational definitions

Dependent variable

- Tax avoidance (TAv) is quantified as the effective tax rate (ETR), determined by dividing tax liability by earnings before taxation. This method quantifies the degree to which companies lower their tax obligations in relation to

their pre-tax income. In accordance with [37], this metric functions as the dependent variable in empirical models of tax avoidance= Tax paid/EBT

Independent and control variables

- **Altman Z-score (Financial distress proxy)**

According to [38], Z-Score reflects bankruptcy risk. Having a Z number of 2.99 means the company is safe. A result between 1.81 and 2.99 suggests grey zone for the company however it is in distress if its Z value is less than 1.81.
It's computed as follows.
Zscore = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5
Where;
Zscore = Financial Distress score[Financial distress measurement]
X1 = Working capital/Total Asset
X2 = Retained Earnings/Total Assets
X3 = EBIT/Total Assets
X4 = book value of equity/Total Liabilities
X5 = Sales/Total Assets

Control variables

Liquidity: This pertains to a business's capability to settle its immediate obligations utilizing its existing assets. It essentially assesses the ease with which a business can liquidate its assets into cash without incurring substantial loss in value to meet obligations such as bills, payroll, and other immediate expenditures.

Profitability: A company's profitability reflects its capacity to generate revenue. It is typically represented as a ratio of income to cost or assets. It demonstrates a business's efficacy in transforming sales into profits, signifying financial sustainability.

Efficiency: Efficiency occurs when a business utilizes its resources, including labor, capital, and assets, to maximize output or revenue while minimizing waste. High efficiency signifies optimal performance in operations and resource management.

Solvability: Solvency signifies long-term financial stability and can pay all of its debts, including both interest and principal. It is crucial for assessing the likelihood of the company's bankruptcy or default over time.

Leverage: Leverage is the amount of degree in which a firm depends on debt to fund its business activities and investments. It amplifies both potential profits

and risks, and individuals frequently utilize it to analyze a company's capital structure and financial strategy.

Firm size: The magnitude of a firm indicates the extent of its operations, which can be quantified using several metrics, including total revenue, total assets, staff count, or market capitalization.

Company age: The age of a firm refers to the duration of its operation or incorporation. It generally represents the maturity and competence of a business.

Sales growth: Sales growth indicates the rate at which a company's revenue is increasing over a specified period. This signifies substantial expansion in the market and the overall companies. It serves as a crucial metric of a company's capacity to proficiently promote its products or services, reflecting the effectiveness of its marketing plan and market initiatives. Sustainable sales growth is essential for enduring profitability, allowing a company to engage in research and development, expand operations, and preserve a competitive advantage.

Table 1 outlines the independent, and control variables employed in the panel regression model, along with their measurement and anticipated correlation with the dependent variable.

Table 1: Measurement of variables and their associations with dependent variable

	variables	**measurement**	
Dependent	Tax avoidance	Tax payable/EBT	**sign**
Independent & Control variables	Liquidity	Current asset/current liability (Current ratio)	-
	Profitability	net profit/total asset (ROA)	-
	Efficiency	Revenue/Total Assets (asset turnover ratio)	-
	Solvency	Total Debt / Shareholders' Equity	+
	Leverage	total debt/asset (Debt ratio)	+
	Firm size	log (Total assets)	+
	Company age	Number of years	-
	Sales growth	Current year's sale- prior year's sales/prior year sales	-
	Financial distress	Zscore(1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5)	+

Table 1: variables with their directions

Sources: author's illustration based on the literature, 2024

This study designates financial distress (FD) as a key independent variable, aiming to investigate the impact of a firm's distress level on its tax avoidance behavior. Financial distress indicates a company's deteriorating financial condition and the necessity to preserve cash, potentially motivating managers to minimize tax liabilities as a means of survival. Consequently, FD is the primary explanatory variable anticipated to influence discrepancies in tax avoidance among enterprises. In order to ensure that the expected effect of financial difficulty is not skewed by other firm-specific financial attributes, the model includes control variables that may also affect tax avoidance choices. By controlling for these variables, the study focuses on the influence of financial distress on tax avoidance, ensuring that the link cannot be misinterpreted by larger variations in financial performance or operational capabilities.

Statistical model

The model specified for testing the hypothesis as follows;

$$Txav_{it} = \beta0 + \beta1(zscore)_{it} + \beta2(liq)_{it} + \beta3(prof)_{it} + \beta4(effi)_{it} + \beta5(sol)_{it} + \beta6(lev)_{it} + \beta7(fmsize)_{it} + \beta8(comage)_{it} + \beta9(salgrth)_{it} + \varepsilon_{it}$$

Where;

Txav - tax avoidance; Liq – liquidity; Prof – profitability; Effi – efficiency; Sol – solvency, Lev – leverage; Fmsize - firm size; Comage - company age; Salgrth - sales growth; i-firm; t-year

4. Result and discussion

4.1. Descriptive statistics

Table 2 summarizes the descriptive statistics. The descriptive statistics among 245 manufacturing enterprises reveals that tax avoidance (txav) runs from 0.00 to 0.50, with a mean of 0.30 and a standard deviation of 0.13. It also implies that, on average, manufacturing companies lower their effective tax burden by 30%, which shows a moderate level of action that minimizes taxes. The dispersion also illustrates that there is a lot of variation among companies: some don't reduce taxes at all, while others avoid up to 50% of what they must pay. The mean value of z score 3.5 tells that the average firm is quite financially healthy. The standard deviation of 1.79 demonstrates, there is a reasonable variation among the firms. The mean and standard deviation of liquidity is 3.06 and 0.85 respectively. This result provides the company with

very strong liquidity with a moderate variation among the manufacturing companies. A 0.15 mean and a 0.08 standard deviation of profitability infer moderate gains(profit) for most companies and relatively small variation among the firms which indicates that Although companies vary in their profit generation, the disparities are not significantly apparent.
Efficiency has a mean of 0.97 and a standard deviation of 0.96, signifying that although several firms exhibit great efficiency, there exists substantial variability in operational efficiency across the enterprises. Solvency has a mean of 1.48 and a standard deviation of 0.46, implying that enterprises are predominantly solvent, with modest variability. Leverage possesses a mean of 0.72 and a standard deviation of 0.69, indicating whilst some companies maintain modest debt levels, others exhibit excessive leverage, reflecting substantial variations in financial structure.

Table 2: descriptive statistics for all variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Txav	245	0.3	0.13	0.00	0.5
zscore		3.5	1.79	0.33	6
liq		3.06	0.85	1.46	5.93
prof		0.15	0.08	0.01	0.3
effi		0.97	0.96	0.01	3
sol		1.48	0.46	0.1	3.04
lev		0.72	0.69	0.02	3
fmsize		7.63	1.68	3.5	15
comage		16.96	11.36	6	58
salgrth		0.41	0.52	.01	2

sources: researcher's own estimations, 2024

The mean value of firm size is 7.63, with a standard deviation of 1.68, suggesting that almost all of firms are medium to big in size, with substantial variability among them. Sales growth has a mean of 0.41 and a standard deviation of 0.52, indicating that, on average, firms enjoy moderate sales growth; however, the substantial variation reflects disparities in performance tracks among firms.

4.2. Validation of Regression Assumptions

The following assumptions were verified by the regression analysis: multi-collinearity was not a problem because the variance inflation factors indicated no meaningful overlap among the explanatory variables. The Random Effects (RE) model was favored by the Hausman test over the Fixed Effects model. Estimated autocorrelation coefficient and heteroskedasticity were shown by the test addressed with cluster-robust standard errors to guarantee reliable inference. Furthermore, endogeneity was not found in a test which further supports the adoption of the RE model with resilient errors as the most suitable and statistically valid technique for this investigation. Refer to the Appendix for further details.

4.3. Regression result and discussion

Table 3 provides the results of the random effects regression, which showed that 86.7% of the explanatory variables explained all of the dependent variable's variation.

As shown from the statistical result, Zscore statistically positively affect tax avoidance. A one-unit increment in the z-score (a higher level of financial health) corresponds to an increment of 0.0077 units in tax avoidance. This demonstrates that companies' tax avoidance behavior is greatly impacted by an increase in the Z-score, which is a measure of financial distress. This data reveals that well-funded businesses and financially healthy companies are more prone to employ aggressive tax methods and tax planning. According to resource-based theory, one explanation could be that more robust businesses have greater administrative capacity, easier access to tax experts, and more intricate organizational structures that allow them to avoid paying taxes. Hence, financial distress inversely correlated with tax avoidance. Consistent with previous research, the finding shows that enterprises experiencing financial difficulties are less likely to actively seek ways to avoid paying taxes. The conclusion is supported by [10], who also discovered a negative link between financial distress and tax avoidance. Liquidity is positively and significantly correlated with Tax avoidance. An increase of 1 unit in liquidity leads to an increase of 0.0015 units in tax avoidance. Companies that are more liquid are able to invest in tax preparation methods because they have more cash or liquid assets accessible. This result consistent with the findings of (Chen et al., 2010), who showed that, because of their greater financial

flexibility, companies with more liquidity are better able to carry out intricate tax avoidance schemes.

This finding is also consistent with agency theory, which postulates that more well-off businesses will seek out ways to minimize their tax liability in order to increase their stock price. Besides, it is supported by [40], who affirmed that Profitability has a strong significant negative impact on tax avoidance. When profit increases by 1 unit, tax avoidance reduces by 0.051 units. Firms that are more lucrative are less inclined to engage in aggressive tax avoidance, as shown by the considerable negative effect of profitability on tax avoidance. According to signaling theory, this makes sense because successful businesses want to keep their tax policies open and honest so they can gain investors' trust and keep their good names. The finding is in line with those of [41], [42] which discovered a negative correlation between manufacturing enterprises' profitability and tax avoidance. Companies in this category may also be less financially motivated to minimize their tax obligations.

Table 3: Random-effects GLS regression result on tax avoidance

Explanatory variables	**Coef.**	**Robust Std. Err.**	**Z-value**
zscore	0.0077*	0.02756	0.28
liq	0.0015*	0.00592	0.26
prof	-.0512***	0.03393	-1.51
effi	0.0345***	0.07903	0.43
sol	-.0138**	0.01248	-1.11
lev	0.0022***	0.00106	2.07
fmsize	0.0047	0.00895	0.53
comage	0.0017	0.00261	0.68
salgrth	-.0024**	0.00868	-0.28
_cons	-.4376	0.14243	-3.07
R^2 within	0.8667	sigma – u	888906.34
R^2 between	0.7252	sigma – e	1335707.8
R^2 overall	0.8321		

***,**and* implies significance level at 1, 5 and10% accordingly

Source: Author's computation, 2024

Efficiency has a strong significant positive relationship with tax avoidance. A 1-unit increase in efficiency yields a 0.034 unit increase in tax avoidance. The correlation between efficient operations and avoiding taxes was positive and

statistically significant. Companies that are more efficient may be in a better position to find and take advantage of tax loopholes because they are better at managing their resources. This aligns with [43], who found a positive relationship between tax avoidance and efficiency. Efficient businesses can afford to employ sophisticated tax schemes. The resource-based view lends credence to this by stressing the fact that tax planning is an area where efficient enterprises can gain a competitive edge.

Another factor that affects tax avoidance negatively is solvency. For every 1 unit increase in solvency, tax avoidance decreases by 0. 0138.Companies that are able to pay their taxes are less likely to try to avoid paying them, according to the law of solvency. One possible explanation for this negative link is that financially stable businesses are less likely to cut taxes and are more likely to keep their finances open and honest in order to entice investors. [36] found a negative correlation between solvency and tax avoidance, therefore this study findings are in line with theirs. From a risk management perspective, financially sound enterprises may avoid aggressive tax procedures to mitigate the possibility of legal troubles or reputational harm.

Leverage statistically positively affects tax avoidance. An increase of 1 unit in leverage results in 0.002 unit increase in tax avoidance. To lower their tax liability and keep up with their debt payments, highly leveraged companies are more likely to engage in tax avoidance strategies, which is positively and strongly correlated with leverage. This result is consistent with the study by [41], who revealed that companies with higher levels of debt are more likely to try to avoid taxes, which lends credence to this finding. Agency theory provides an explanation for this phenomenon by positing that managers of heavily indebted enterprises are incentivized to maximize cash flows by avoiding taxes.

Increases in sales growth of 1 unit lead to a drop in tax avoidance of 0.0024 units. Increasing sales growth is associated with a decreased likelihood of tax avoidance, according to this result. Perhaps this is due to the fact that expanding businesses frequently work to be open and honest with all of its stakeholders, including investors and government agencies. This study's findings are in accordance with those of [23], who found that aggressive tax strategies are less common among companies that care about their public image and long-term viability, which includes many companies with high sale growth. [44] came to a similar conclusion, stating that, perhaps as a result of increased scrutiny and the drive for compliance, tax avoidance was lower in companies with better levels of performance, including sales growth.

Companies with clear and consistent growth patterns are less likely to engage in tax avoidance, according to these studies.

5. Conclusion, Theoretical Implications, Practical Implications, and Recommendations

5.1. Conclusion

This study investigated the impact of financial distress on tax avoidance in manufacturing companies located in the South Wollo District of Ethiopia. According to the random effect regression results, tax avoidance is positively and significantly affected by liquidity, efficiency, leverage, and Z-score, which is a measure of financial distress. In contrast, financial distress (which is computed by Zscore), profitability, sales growth and solvency were found to negatively influence tax avoidance. The results suggest that higher Z-scores (lower financial distress), which measure firms' financial condition, may make them more prone to tax avoidance tactics, either because of their more complicated organizational structures or because they have easier access to more advanced tax planning tools.

On the other hand, the lower Z-score (the greater financial distress) correlates with a lower likelihood of engaging in tax avoidance. Companies in financial crises are more likely to prioritize short-term survival over long-term planning, have less resources to implement complicated tax methods, and are thus less likely to participate in tax avoidance. As a result of low taxable income and a desire to maintain good standing with creditors, investors, and government agencies, many businesses may refrain from engaging in tax avoidance strategies that put them at risk. Consequently, financial distress is often associated with more cautious tax strategies.

Furthermore, companies exhibiting robust liquidity, operational efficiency, and elevated leverage may engage in tax avoidance strategies to enhance cash flow and reinvestment potential. In contrast, companies that are financially stable and profitable may want to avoid aggressive tax procedures for reasons related to their reputation and the longevity of their investor relationships. Firms that are financially secure, meaning they are profitable and solvent, typically use less aggressive tax methods to maintain transparency and lower regulatory or reputational risk.

The study concludes that companies are more likely to participate in tax avoidance when they are financially healthy, liquid, efficient, and experiencing

higher leverage, and less likely to do so when they are profitable, solvent, well grown and financially distressed. The findings, derived from empirical evidence in the Ethiopian manufacturing companies, enhance the existing literature on tax planning in developing nations and highlight the significant influence of firm-specific financial variables on tax behavior if lawmakers and tax authorities are serious about reducing tax avoidance through better informed and -targeted financial regulation, these findings should be considered.

5.2. Theoretical Implications

This study adds the literature on tax avoidance by offering data obtained from the South Wollo District of Ethiopia, a developing economy with unique institutional and regulatory features, and illustrates how firm-specific financial variables influence tax avoidance in these circumstances. The results predominantly support Agency Theory, indicating that enterprises with substantial liquidity, robust efficiency, and rapid sales growth are more inclined to pursue tax avoidance, implying that managerial discretion and performance pressures drive aggressive tax methods. Leverage positively influences agency-driven incentives, as leveraged enterprises may evade taxes to conserve cash for debt payments. The negative correlation between financial distress and tax avoidance contradicts theoretical assumptions that struggling firms engage more aggressively in tax planning, and instead supports Legitimacy Theory, suggesting that distressed firms may avoid risky strategies to preserve regulatory acceptance. The inverse correlation among profitability, solvency, and tax avoidance reinforces Institutional and Stakeholder Theory, suggesting that financially secure companies prioritize long-term reputation, regulatory adherence, and stakeholder relations over immediate tax benefits. The study elucidates the impact of liquidity, leverage, efficiency, solvency, sales growth, and profitability on tax avoidance, providing context-specific theoretical insights pertinent to developing economies characterized by institutional constraints, limited enforcement capacity, and dynamic tax systems that generate distinct incentives. The findings advocate for the development of theories that acknowledge the institutional limitations of developing nations and emphasize the necessity of context-specific tax policies and enforcement mechanisms.

5.3. Practical Implications

The findings offer valuable guidance for policymakers and tax officials on improving tax enforcement in Ethiopia's manufacturing industry. By acknowledging that companies exhibiting greater liquidity, efficiency, and leverage are more susceptible to aggressive tax strategies, authorities can prudently direct audit resources to high-risk organizations, thus enhancing detection rates and minimizing compliance discrepancies. Incorporating financial indicators into risk-assessment systems can enhance audit planning efficiency and alleviate superfluous administrative expenses. The study substantiates the establishment of a more data-driven and targeted tax administration system that can enhance revenue collection while promoting equitable and transparent corporate practices.

5.4. Recommendations

The study suggests tax authorities enhance targeted audit programs by focusing on manufacturing industries exhibiting high liquidity, robust operational efficiency, and elevated leverage, as these traits correlate with increased tax avoidance. To improve enforcement effectiveness, tax authorities ought to upgrade their risk-based assessment models by incorporating firm-level financial indicators into audit selection criteria, thereby facilitating more precise identification of aggressive tax practices. Furthermore, ongoing capacity enhancement for tax auditors, especially in financial analysis and the identification of intricate avoidance strategies, is crucial for elevating the general quality and accuracy of tax administration.

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Appendix

Hausman specification test

```
b = Consistent under H0 and Ha; obtained from xtreg.
   B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic
```

```
    chi2(9) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)
            =   7.86
Prob > chi2 = 0.5483
```

Serial Autocorrelation

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
F(1,    48) =      9.859
       Prob > F =      0.0029
```

Multicollinearity

Variance inflation factor (VIF)

Variable	VIF	1/VIF
prof	2.95	0.338974
effi	2.47	0.405175
zscore	2.32	0.431300
fmsize	1.54	0.649103
solv	1.43	0.698425
salgrth	1.35	0.741944
comage	1.33	0.751048
liq	1.23	0.810287
lev	1.04	0.957145
Mean VIF	1.74	

Heteroskedasticity

```
Estimated results:
                         |       Var     SD = sqrt (Var)
                ---------+-----------------------------
                    txav    |   0.0285712      0.1690122
                       e |   0.0283697        0.1684332
                       u |           0                0

        Test: Var(u) = 0
                           chibar2(01) =     4.54
                           Prob > chibar2 =   0.0166
```

Endogeneity

```
Instruments: IV - Leverage

  Tests of endogeneity
  H0: Variables are exogenous

  Durbin (score) chi2(1)          = .780508 (p = 0.3770)
  Wu-Hausman F (1,185)             = .636059 (p = 0.4293)
```

RE regression result

Random-effects GLS regression

txav	Coefficient	Robust std. err.	z	P>|z|	[95% conf.	interval]
zscore	.0077378	.0275669	0.281	0.082	-.0462933	.0617689
liq	.0015751	.0059269	0.266	0.091	-.0100416	.0131918
prof	-.0512609	.0339349	-1.511	0.000	-.1177733	.0152515
effi	.0345136	.0790323	0.437	0.000	-.1203897	.1894169
solv	-.0138717	.0124856	-1.111	0.012	-.0383435	.0106001
lev	.0022040	.0010607	2.078	0.000	.0001250	.0042830
fmsize	.0047880	.0089554	0.535	0.593	-.0127646	.0223406
comage	.0017842	.0026167	0.682	0.495	-.0033445	.0069129
salgrth	-.0024797	.0086887	-0.285	0.010	-.0195096	.0145502
_cons	-.4376284	.1424340	-3.072	0.271	-.7167990	-.1584578

R^2 within	0.8667	sigma – u	888906.34
R^2 between	0.7252	sigma – e	1335707.8
R^2 overall	0.8321		