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The effect of tax avoidance, tax risk, gender diversity, and audit quality on firm risk

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Abstract
The relationship between tax avoidance and firm risk is a complex topic with inconsistent findings in previous literature. This study aims to re-examine this relationship by incorporating other key variables, analyzing the effects of tax avoidance, tax risk, gender diversity, and audit quality on firm risk.
This research employs a quantitative approach using multiple linear regression analysis on a sample of manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2021-2023 period.
The results show that tax risk has a significant positive effect on firm risk, while audit quality has a significant negative effect. This finding suggests that high-quality auditors (Big 4) are effective in reducing firm risk. Conversely, tax avoidance (measured by ETR) and gender diversity were not found to have a significant influence on firm risk. These findings imply the importance of managing tax risk and highlight the vital role of high-quality audits in mitigating firm risk within the Indonesian manufacturing sector.

Keywords: Firm risk, tax avoidance, tax risk, gender diversity, audit quality, manufacturing sector

Introduction

Risk is a complex and frequently debated concept, with various definitions. This debate centers on the question of whether risk is entirely objective and measurable, or whether it is influenced by beliefs and morality. This issue becomes even more pronounced with the emergence of systemic risks, such as climate change or pandemics, which demonstrate the complex interdependencies between various factors. Therefore, research that focuses solely on a single aspect often fails to effectively explain, predict, and address complex risks (Guedrib & Bougacha, 2024) [10].

In a corporate context, risk can be viewed from various perspectives. This research focuses on understanding how firm risk arises from the complex interaction between management policies and the business environment. One of the most important management policies, and one that poses potential risk, is tax avoidance. While this practice aims to reduce the tax burden, it can also increase company-specific risks due to potential challenges from tax regulators (Dhaliwal *et al*., 2017) [8].

However, previous research on the relationship between tax avoidance and firm risk has been mixed. This discrepancy is likely due to factors such as differences in research methods and sample periods, as well as the neglect of tax risk (Guenther *et al*., 2017; Cao *et al*., 2021) [6, 12]. Tax risk, defined as uncertainty regarding future tax obligations, can have a direct impact on companies. Therefore, this study will also explain the relationship between tax risk and firm risk.

In addition to tax avoidance and tax risk, other factors such as corporate governance and audit quality also influence firm risk. The presence of gender diversity on the board of directors is thought to improve monitoring effectiveness and reduce excessive risk-taking (Jia, 2019) [15]. However, empirical findings regarding this relationship are inconsistent (Sila *et al*., 2016; Bernile *et al*., 2018; Anchour, 2022) [4, 20]. On the other hand, audit quality, often measured by the use of Big-4 audit firms, is thought to reduce firm risk due to the global networks and superior resources these firms possess (Bakri, 2021) [2].

This study focuses on manufacturing companies listed on the Indonesia Stock Exchange (IDX). The manufacturing sector was chosen due to its significant contribution to national Gross Domestic Product (GDP), complex operational characteristics, and high-risk exposure. Furthermore, manufacturing companies tend to have good financial reporting quality and diverse governance structures, including gender diversity on boards and audit committees. This complexity makes the manufacturing sector a relevant context for examining the effects of tax avoidance, tax risk, gender diversity, and audit quality on firm risk.

Theoretical Framework and Hypothesis Formulation

This section describes the theories that form the basis of the research and formulates hypotheses that are developed based on these theoretical foundations.

Agency Theory

Agency theory (Jensen & Meckling, 1976) [16] highlights the existence of conflicts of interest between shareholders and managers, which can give rise to agency costs. One manifestation of this is the practice of tax avoidance to reduce tax burdens and improve performance image, as well as the emergence of tax risks that can increase firm risk.

In Indonesian corporate governance, POJK No. 33/POJK.04/2014 emphasizes the role of directors as managers and commissioners as supervisors. Board independence and diversity, in terms of gender, age, and background, have been shown to strengthen the monitoring function and reduce agency conflicts arising from management behavior (Sila *et al*., 2016) [20]. This mechanism is crucial to ensure that strategic decisions, including tax policies, remain aligned with shareholder interests.

Furthermore, the presence of independent auditors is a crucial control element. Auditors ensure the quality of financial reports and play a role in detecting potential agency conflicts and tax risks through audits in accordance with international auditing standards, thus providing additional protection for shareholders (Berisha, 2020) [3].

Signaling Theory

The Signaling Theory introduced by Spence (1973) [21] explains how parties who have more information (signaler) convey relevant and credible signals to parties with less information (receiver) to reduce uncertainty and increase trust. These signals can be positive or negative information and influence the recipient's decisions (Connelly *et al*., 2011) [7].

In the context of managerial policy, tax avoidance practices can provide signals. certain information to investors. These signals can be perceived as positive or negative information, influencing stakeholder reactions (Nurcahyono, 2021) [18]. In line with this, research by Hanlon and Slemrod (2009) [13] shows that tax avoidance can be viewed differently depending on the context. If the activity is viewed as a form of efficient tax planning with a relatively low risk of detection, investors tend to view it positively. However, if it is perceived as an act of non-compliance with a high risk of detection, the practice will incur significant future costs and negatively impact company value.

Hypothesis Formulation

The Effect of Tax Avoidance on Firm Risk.

Tax avoidance encompasses all tax planning activities that reduce a firm tax burden relative to pre-tax income, with a potentially uncertain outcome. projections, create valuation differences among investors, and increase stock return volatility. While tax savings can lower the cost of capital, aggressive tax practices actually increase tax risk, potential penalties, and cash flow uncertainty, leading to increased firm risk (Cao *et al*., 2021) [6].

From an Agency Theory perspective, managers, as agents, may exploit the complexity of tax strategies for personal gain, reducing transparency and increasing agency costs, thereby creating additional risks for shareholders. Meanwhile, according to Signaling Theory, tax avoidance sends a dual message: it can be perceived positively as evidence of management efficiency, but also negatively as an indication of non-compliance, ultimately affecting risk perceptions and investment decisions. Based on this explanation, the first hypothesis of this study is:

H1: Tax avoidance has a negative effect on firm risk.

The Effect of Tax Risk on Firm Risk

Tax risk is defined as the uncertainty of future tax outcomes arising from current actions, omissions, or errors in information processing (Neuman *et al*., 2020) [17]. This risk arises not only from tax avoidance activities but can also occur even if a company is fully compliant. This uncertainty gives rise to various costs, such as tax planning costs, compliance and audit costs, potential fines and sanctions, and reputational and political costs (Hutchens *et al*., 2015) [14]. Furthermore, risky tax strategies can trigger conflicts of interest between managers and shareholders, thereby increasing agency costs.

Research shows that tax risk increases firm risk because tax uncertainty is reflected in cash flow and stock return volatility. The volatility of the cash effective tax rate is an important indicator that indicates uncertainty about tax payments and a company's future financial risk (Guenther *et al*., 2017) [12]. Therefore, the greater the tax uncertainty, the greater the risk reflected in the company's value and stability. Based on several findings from previous research sources, the second hypothesis is formulated as follows:

H2: Tax risk has a positive effect on firm risk.

The Effect of Board Gender Diversity on Firm Risk

Gender diversity on the board of directors can improve the quality of oversight and decision-making, as the presence of women encourages more ethical, prudent, and accurate processes. Female directors tend to be conservative and avoid risky behavior, thereby reducing potential conflicts of interest and increasing the reliability of financial reports (Byron & Post, 2016) [5]. In relation to risk, diverse views can actually balance group decisions and reduce the volatility of financial policies. Research evidence shows that companies with gender-diverse boards tend to have lower stock volatility and firm risk (Bernile *et al*., 2018) [4]. Based on several findings from previous research sources, the third hypothesis is formulated as follows:

H3: Board gender diversity has a negative Effect on firm risk.

The Effect of Audit Quality on Firm Risk

Audit quality plays a crucial role in ensuring financial reporting complies with applicable accounting standards and regulations. Independent and competent auditors are able to detect material errors and indications of fraud, thereby reducing the risk of misleading information for shareholders and stakeholders (Francis & Wang, 2008) [9]. Well audited financial statements enhance investor and creditor confidence while also providing management with input on strengthening internal controls and operational efficiency.

H4: Audit quality has a negative effect on firm risk.

Research Methods

This section describes the characteristics of the population and sample used in the study, the definition and measurement of each variable, and also explains the analysis model applied in this study

Population and Sample

The population of this study includes all manufacturing companies listed on the Indonesia Stock Exchange (IDX), while the sample was selected using the method purposive sampling, a non-probability technique that selects the most relevant units for the research objectives. This selection takes into account time and resource efficiency to ensure representative results.

Variables and Their Measurement

This study uses one dependent variable, namely Firm Risk and four independent variables, namely Tax Avoidance, Tax Risk, Board Gender Diversity and Audit Quality, as well as three control variables, namelyReturn on Asset, firm size, and leverage. The following are the variables used in this study and their measurements:

Table 1: Variables and Their Measurement

Variabel	Symbol	Measurement
Variabel Dependen		
Firm Risk	Firmrisk	FIRMRISK = Standard deviation of monthly stock returns
Variabel Independen		
Tax Avoidance	ETR	ETR = Tax Expense / Earnings Before Tax
Tax Risk	Taxrisk	TAXRISK = Standard Deviation CETR for 3 years
Gender Diversity	DG	DG = 1 - (Pl^2+ Pw^2)
Audit Quality	AQ	Dummy Variables: 0: Big-4 1: Non-Big-4
Variabel Kontrol		
Return on Asset	ROA	ROA = (Net Profit / Total Assets) x 100%
Firm Size	SIZE	SIZE = ln (Total Assets)
Leverage	LEV	LEV = Total Liability / Total Assets

Research Model

This study uses a quantitative approach to examine the influence of Tax Avoidance, Tax Risk, Gender Diversity, and Audit Quality on Firm Risk. Data analysis was conducted using multiple linear regression methods to determine the simultaneous and partial influence of independent variables on the dependent variable. Prior to the regression analysis, classical assumptions were tested, including: a normality test (to ensure the residuals are normally distributed), a multicollinearity test (to avoid high correlations between independent variables), and a heteroscedasticity test (to test whether the residuals have the same variance constant), and autocorrelation tests (to detect relationships between residuals in time series data). After the model meets the assumptions, an F-test is performed to examine the influence of independent variables simultaneously, and a t-test to examine the influence of each variable partially. Furthermore, the coefficient of determination (R^2) is used to measure the contribution of the independent variables in explaining the dependent variable.

The multiple linear regression analysis model used in this study is:

$$FIRMRISK_{i,t} = \alpha_0 + \alpha_1 ETR_{,t} + \alpha_2 TAXRISK_{i,t} + \alpha_3 GD + \alpha_4 AQ + \alpha_5 ROA + \alpha_6 SIZE_{,t} + \alpha_7 LEV_t + \varepsilon_{it}$$

Dimana,

FIRMRISK	= Firm Risk
ETR_t	= Tax Avoidance
TAXRISK	= Tax Risk
GD	= Gender Diversity
AQ	= Audit Quality
ROA	= Return on Asset
SIZE	= Firm Size
LEV	= Leverage
α	= Regression coefficient value

Research Results and Discussion

This section is the research results and discussion containing an explanation of sample selection and findings which include descriptive statistical analysis, normality tests, and hypothesis tests.

Research Sample Description

The subjects of this study were manufacturing companies listed on the Indonesia Stock Exchange with financial reporting periods of 2021–2023. The sample was selected based on data completeness criteria, namely companies with positive pre-tax profits and presenting tax information for 2021–2023, as well as tax data for the previous two years (2019 and 2020). However, the number of companies meeting these criteria was relatively limited, primarily because the 2020–2022 period was still in the post-pandemic recovery period, resulting in few companies being able to report consistently positive profits for five consecutive years.

Descriptive Statistical Analysis

Table 2 shows the descriptive statistical analysis for the variables used, descriptive statistical analysis was conducted on five main variables with a sample size of 156. For the Tax Avoidance (ETR) variable, the average value was 0.2291 with a minimum value of 0.0104 and a maximum of 0.8069, and a standard deviation of 0.0941. For the Tax Risk (TAXRISK) variable, the average value was 0.0506 with a minimum value of 0.0006 and a maximum of 0.2980, and a standard deviation of 0.0605. The Gender Diversity (DG) variable shows an average of 0.1718, with a minimum value of 0.0000 and a maximum of 0.4800, and a standard deviation of 0.1622. Meanwhile, the Audit Quality (AQ) variable has an average of 0.5000 with a value range of 0.0000 to 1.0000 and a standard deviation of 0.5016.

For the control variables, Firm Risk (FIRMRISK) has an average of 0.0966 with a minimum value of 0.0125 and a maximum of 0.3435, and a standard deviation of 0.0617. Meanwhile, the Return on Assets (ROA) variable shows an average of 0.0969 with a standard deviation of 0.0696, indicating fairly stable financial performance. Meanwhile, the Firm Size (SIZE) variable has an average of 29.2584 with a minimum of 26.3242 and a maximum of 33.7306, and a standard deviation of 1.6692, which describes the majority of medium to large-sized companies. Finally, Leverage (LEV) records an average of 0.3443 with a minimum of 0.0440 and a maximum of 0.7971, and a standard deviation of 0.1712.

Normality Test

Table 3 presents the results of the normality test using the Kolmogorov-Smirnov test showing the value asymp. sig. each variable has a value > 0.05, thus indicating that the research data is normally distributed.

Coefficient of Determination Test

Table 4 Based on the Model Summary Table, it is known that the Adjusted R Square is 0.9106. It can be said that this indicates that the variables ETR, TAXRISK, DG, AQ, ROA, SIZE, and LEV are able to explain variations in firm risk by 10.6%, while the remaining 89.4% is explained by other factors outside this model.

Significance Test (F Statistic Test)

Based on table 5 Based on the ANOVA table, it can be seen that the significance value (Sig.) obtained in this regression model is 0.001, which means the condition is below the probability value of 0.050. This condition indicates that the regression model is significant overall and There is a strong relationship between the independent variables and the dependent variable. Furthermore, the calculated F value of 3.631 indicates that this regression model has a strong influence on FIRMRISK. The higher the F value, the better

the model is at explaining the relationship between the independent variables and the dependent variable. Therefore, it is concluded that ETR, TAXRISK, DG, AQ, ROA, SIZE, and LEV simultaneously have a significant influence on FIRMRISK.

Individual Parameter Significance Test (t-Statistic Test)

Based on the t-test results presented in Table 6, findings were obtained regarding the influence of each independent variable on firm risk. A constant value of -3.570 indicates that, assuming all independent variables are zero, the firm's risk is at that value.

The analysis results show that the Tax Avoidance (ETR) variable does not have a significant effect on firm risk, as evidenced by the regression coefficient value of -0.359 with a significance value (p-value) of 0.517, which is greater than 0.05. In contrast, the Tax Risk (TAXRISK) and Audit Quality (AQ) variables have a significant effect. Tax Risk shows a significant positive relationship with a coefficient of 2.436 and a significance value of 0.009, indicating that the higher the tax uncertainty, the greater the risk faced by the company. Meanwhile, Audit Quality has a significant negative effect with a coefficient of -0.288 and a significance value of 0.009. These findings confirm that better audit quality can contribute to reducing firm risk.

On the other hand, the Gender Diversity (DG) variable was not shown to have a significant influence on firm risk, with a coefficient of 0.001 and a significance value of 0.997. Meanwhile, the control variables Profitability (ROA) and Leverage (LEV) were shown to have a significant influence. Profitability has a significant positive relationship (coefficient 1.490; significance 0.049), which means that companies with higher levels of profitability tend to have greater risks. Similarly, Leverage has a significant positive influence (coefficient 0.636; significance 0.029), indicating that higher debt levels are associated with increased firm risk. Finally, the Firm Size (SIZE) variable did not show a significant influence on firm risk, with a coefficient of 0.028 and a significance value of 0.428.

Based on the results of the regression test above, the following results were obtained in this study:

1. ETR (Tax Avoidance) has a significance level of 0.517, which means that ETR does not have a significant effect.
2. TAXRISK (Tax Risk) has a significance of 0.009, indicating that TAXRISK has a significant effect.
3. DG (Gender Diversity) has a significance level of 0.997, which means that DG does not have a significant effect.
4. AQ (Audit Quality) has a significance of 0.009, indicating that AQ has a significant effect.
5. From these results, it can be concluded that TAXRISK and AQ have a significant effect, while ETR and DG do not have a significant influence.

Hypothesis Testing

Table 7: represents a summary of the results of the hypothesis test.

Table 2: Hypothesis Testing

Hypothesis Statement	p-value	Decisions
H1: Tax avoidance has a negative effect on firm risk.	0,517	Rejected
H2: Tax risk has a positive effect on firm risk.	0,009	Accepted
H3: Board gender diversity has a negative Effect on firm risk.	0,997	Rejected
H4: Audit quality has a negative effect on firm risk.	0,009	Accepted

Based on the hypothesis testing that has been carried out, the following conclusions can be drawn:

Based on the results of the hypothesis test, it was found that tax avoidance was not proven to affect firm risk because the significance value of 0.517 was greater than 0.05, so the first hypothesis (H1) is rejected. This finding aligns with research by Guenther *et al*. (2017) [12], which asserts that the influence of tax avoidance on Firm risk is contextual and not always significant, especially when the practice is carried out conservatively and accompanied by good governance.

The results of the hypothesis test also show that tax risk has a positive effect. significant to firm risk because the p-value of 0.009 is smaller than 0.05, so the second hypothesis (H2) accepted. This finding supports research by Guenther *et al*. (2017) [12], which shows that uncertainty about tax obligations increases earnings volatility and increases the cost of capital, thereby increasing Firm risk.

For the gender diversity variable, it was found that board gender did not have a significant effect on firm risk because the significance value of 0.997 was greater than 0.05, so the third hypothesis (H3) is rejected. These results are consistent with Sila *et al*. (2016) [20] who found that the presence of women on the board does not automatically reduce Firm risk, especially if women's strategic role in decision-making is still limited.

Meanwhile, the results of the hypothesis test show that audit quality has a negative effect on firm risk because the p-value of 0.009 is smaller than 0.05, so the fourth hypothesis (H4) accepted. This finding aligns with Francis & Wang (2008) [9] and Sari *et al*. (2023), who stated that high-quality audits increase the credibility of financial reports and reduce information asymmetry, thereby lowering risk perceptions among investors and creditors.

Overall, this study confirms the importance of tax risk control and improving audit quality as the main factors in reducing the risks of manufacturing companies. while tax avoidance and board gender diversity did not show any significant influence in the context of the 2021–2023 period.

Conclusion and Limitations

This section contains research conclusions, research limitations, and suggestions for future research.

Conclusion

The purpose of this study is to determine the effect of tax avoidance, tax risk, gender diversity, and audit quality on Firm risk. The sample used in this study is manufacturing companies listed on the Indonesia Stock Exchange from 2021 to 2023. The sample was selected using thepurposive sampling. The company data obtained was 156 companies from 2021 to 2023.

Based on the data processing results, this study concludes that tax avoidance, as measured by ETR, has no significant

effect on Firm risk. However, tax risk has been shown to have a positive and significant effect on Firm risk, while board gender diversity has no significant effect. Meanwhile, audit quality has a significant negative effect, indicating that improving audit quality can reduce Firm risk.

Limitations

Based on the research conducted, there are limitations that need to be addressed n future research to achieve better and more comprehensive results. Although systematically conducted, this study still has several limitations, including the use of multiple linear regression, which assumes linearity, normality, and freedom from multicollinearity. Furthermore, the reliability of this study depends on the quality and completeness of public secondary data. Important factors such as other external dynamics and regulatory adjustments were also not comprehensively accounted for in this analysis.

Suggestion

Based on the results of the analysis, findings, and limitations in this study, there are recommendations that can be used as guidelines for further research to obtain more comprehensive and accurate results. Based on the limitations identified in this study, it is recommended that further research use a more complex and adaptive analytical approach to dynamic data patterns.

Further research is recommended to examine other variables, or even macroeconomic variables, that may influence Firm risk. Furthermore, to deepen the results, the study could be expanded to various industrial sectors and use cross-country data to compare the effects of governance across jurisdictions. Future research could also include mediating variables such as financial reporting transparency or good corporate governance, or moderators such as firm size, to determine whether the relationship between the main variables is affected by other factors.

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