



DOES BANK RISK-TAKING BEHAVIOR AFFECT CORPORATE INCOME TAX EXPENSES?

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Abstract

This study examines the effect of bank risk-taking behavior on income tax expense recognized in the financial statements. The study uses a secondary data analysis approach to the annual reports and financial statements of 46 banks listed on the Indonesia Stock Exchange from 2004 to 2022, with 566 observations. The sample selection was done purposively based on certain criteria to ensure data completeness and consistency. The analysis technique used is Ordinary Least Squares (OLS) regression to identify the relationship between risk variables and tax expenses. The results show that high risk-taking behavior, as measured by SDROA and SDROE variables, negatively affects the income tax expenses reflected in the effective tax rate (ETR). Banks with high-performance volatility tend to utilize tax planning space to maintain liquidity and profitability. The difference in effect between SOE and non-SOE banks confirms that ownership structure affects flexibility in recognizing tax expenses. Pandemic conditions and reduced corporate income tax rates further strengthen the negative relationship between risk and ETR. Pandemic conditions and the reduction in corporate income tax rates during the 2020-2022 period also increase the bank's room for maneuver to manage the recognition of its tax expenses.

Keywords: Bank risk-taking behavior, Banking, Corporate income tax expenses, Corporate risk

INTRODUCTION

Business risks significantly impact corporate operations, giving rise to a range of issues that can impede business performance and sustainability (Hanaysha et al., 2022; Settembre-Blundo et al., 2021; Shad et al., 2019). The primary objectives of effective enterprise risk management are to enhance the organization's comprehension of risks, implement risk management systems, and augment the collective capacity to mitigate risks (Yang, 2023). This process entails the monitoring and controlling of risks across a range of company-wide domains, including strategic, financial, operational, compliance, and reputational risks. The objective is to prevent unexpected performance fluctuations and optimize the company's intrinsic value (Wahyuni et al., 2021). Market risk is of vital importance to the functioning of the business and has a direct impact on the company's growth and financial success. Ensuring an organization's sustainable growth is paramount to effectively managing operational risk, which encompasses factors related to operational performance. It is incumbent upon companies to identify, measure, and monitor operational risks to ensure the smooth functioning of their operations and the long-term sustainability of their activities (Santoso, 2023). Both anticipated and unanticipated risks have the potential to have a deleterious impact on a company, particularly during pivotal phases such as inception and expansion.

High-tech firms frequently encounter financing challenges due to the substantial investments and elevated risk profiles inherent to their operations (Arena et al., 2018; Cowling et al., 2021). These factors can disrupt the flow of capital and impede the smooth functioning of their regular operations (Li, 2023). The costs incurred by an enterprise may be attributed to many uncertainties and risks, including those about the market, technology, finance, and unforeseen circumstances. These factors have the potential to exert an influence on the enterprise's overall operational performance (Tan, 2024). The effective identification and strategic handling of risks can strengthen financial performance, protect business value, and enhance competitiveness (Păunescu & Argatu, 2020). Moreover, the effective implementation



of risk management strategies can enhance the stability of business operations and promote growth (Stan-Maduka, 2010). Integrating business continuity management and risk management allows companies to optimize their ability to handle unfavorable situations and improve overall operational procedures (Mošková, 2023).

The banking industry is widely regarded as an inherently risky sector. The banking industry is a high-risk sector due to its numerous challenges, which can potentially jeopardize financial stability and financial viability. A significant contributing factor to the elevated risk profile of the banking industry is the prevalence of cyber-attacks. The potential consequences of cybersecurity risks, including phishing, ransomware, and insider attacks, include financial liabilities, reputational damage, and legal consequences (Darem, 2023; Reis, 2024). Furthermore, technological advancements, particularly financial technology (fintech) and the incorporation of big data into banking operations have introduced novel challenges regarding data protection and the capacity to withstand operational disruptions (Hasan et al., 2023; Nnaomah, 2024). Financial institutions are vulnerable to substantial data security threats due to the lack of robust organizational frameworks and management systems aligned with data security protocols (Hasan et al., 2023). Furthermore, the banking sector is exposed to risks associated with credit management and non-performing assets (NPAs). The probability of a borrower defaulting on a loan and the amount of capital at risk can significantly impact the anticipated financial loss to the bank in the event of a default (Stomper, 2006).

The presence of non-performing assets, or loans that borrowers do not repay, represents a significant challenge for banks, as it can affect their stability and profitability (Kharche & Gupta, 2023). Moreover, fraud activities in the banking industry have increased, with perpetrators employing increasingly sophisticated methods. This has resulted in significant financial losses and reputational damage to banks (Bhasin, 2015). Furthermore, labor concerns and the necessity for effective risk management strategies contribute to the overall risk profile of banking businesses. Labor-related challenges, such as the detection and mitigation of risk, can impact the performance and stability of the bank (Roy & Vishwanathan, 2018). Therefore, banks must employ efficient risk management techniques to identify, assess, and mitigate potential risks that could impact their financial stability.

The main issue raised in this section is the increasing complexity and intensity of risks in the banking industry, especially those stemming from non-performing loans, fraud, and labor issues. These three aspects not only disrupt the stability and profitability of banks but also put pressure on their risk management systems (Bhasin, 2015; Kharche & Gupta, 2023; Roy & Vishwanathan, 2018). With increased exposure to such risks, banks adopt higher risk-taking strategies, including managing their tax burden. This suggests an urgent need to examine the relationship between banks' risk-taking behavior and tax policies. Therefore, identifying and analyzing the effect of risk on effective tax rates is important to ensure banks' financial sustainability and stability.

Corporate risk, particularly within the banking sector, has considerable implications for the tax aspects that can impact firm value. The findings of a study conducted by Guedrib & Marouani (2023) in Tunisia, tax avoidance positively impacts business value. In contrast, tax risk has a negative effect on firm value. This indicates that tax avoidance strategies can simultaneously impact risk and firm value. Moreover, a study conducted by Guedrib (2024) on a sample of Chinese firms revealed a direct correlation between business risk, the effective tax rate (ETR), and the cash ETR. The findings of this study indicate that implementing tax avoidance strategies tends to reduce the level of risk faced by companies in China.

Nevertheless, research conducted by Cao et al. (2020) in the United States revealed no statistically significant correlation between tax avoidance, measured by a lower effective tax rate, and future corporate risk. This phenomenon can be attributed to the capacity of American



companies to allocate capital to tax-advantaged assets and generate consistent cash flows, which may reduce risk. This discrepancy in findings underscores the intricate relationship between tax avoidance and corporate risk, shaped by factors such as investment decisions and measurement methodologies. Moreover, research conducted by Sofianty et al. (2022) indicates that tax avoidance positively impacts corporate risk, suggesting that tax avoidance activities can influence the level of risk the company faces. The concept of strategic tax variation, as explored by Habib (2024), may intensify the risks associated with tax avoidance, jeopardizing the company's overall value.

The main objective of this study is to examine the effect of banking risk behavior on corporate income tax expenses in Indonesian banking companies. Specifically, Indonesia has tax regulations closely related to the banking industry, namely “Minister of Finance Regulation Number 74 Year 2024 on the Establishment of Bad Debt Reserves that May Be Deducted from Gross Income”. Minister of Finance Regulation No. 74 Year 2024 stipulates the provisions regarding the provision of bad debts that can be deducted from gross income in calculating corporate income tax in the banking sector. The expense is carried out through two mechanisms: direct write-off of receivables when they are obviously uncollectible or through establishing an allowance for bad debts since the receivables are recognized. Fiscally, establishing an allowance for bad debts is calculated based on the final carrying amount minus the initial carrying amount of the tax year, taking into account uncollectible receivables during the year. The allowance is limited by a certain percentage in accordance with the quality of collectibility of receivables. This provision ensures that the allowance for bad debts is recognized relatively by Indonesian financial accounting standards while preventing excessive allowances so that the potential for corporate income tax is maintained. Thus, this provision provides legal certainty and fairness for banks in managing risks and fulfilling tax obligations appropriately.

This study is significant as the risk behavior associated with banking companies has the potential to exert a considerable influence on tax expenses. One illustration of this influence is provided by income smoothing practices, which not only affect shareholders' perceptions of the firm. However, it can also be employed to reduce tax expenses or manipulate banks' risk evaluation (Siggelkow & Zülch, 2013). Furthermore, in the German tax system, banks that present a greater risk to the financial system's stability tend to be subject to higher taxes. This indicates a correlation between the degree of risk associated with banking companies and their tax obligations (Buch et al., 2016). The frequency of profit tax expense can impact several corporate financial metrics, including firm value, the weighted average cost of capital (WACC), and the cost of equity. The extant literature indicates that financial parameters are contingent upon the frequency of profit tax expense, thereby establishing a discernible correlation between tax expense and financial performance (Brusov et al., 2022; Brusov & Filatova, 2022).

Moreover, using tax avoidance methods may increase the uncertainty of future corporate tax expenses, thereby acting as an essential indicator of a firm's vulnerability to investment. Firms are more likely to employ aggressive tax planning techniques in financial difficulties. This underscores the interconnection between financial stability, risk management, and tax strategies (Firmansyah & Muliana, 2018). This research aims to provide a more nuanced understanding of how banking risk behavior affects tax liabilities, facilitating more informed decision-making in risk management and corporate tax strategies.

This research makes a theoretical contribution by expanding the understanding of the dynamics between banking risk behavior and tax expense. By undertaking an exhaustive examination of the influence of the effective tax rate on risk-taking behavior within the banking sector, this study addresses a significant gap in knowledge in finance and taxation. From a practical standpoint, the findings of this study are of significant value to practitioners in the banking sector, regulators, and policymakers. Banks can optimize their risk management and



tax compliance strategies by understanding the factors influencing tax expense and risk behavior. This directly supports more effective decision-making in managing financial and tax risks. Furthermore, this research provides insights that tax authorities can employ in designing policies that consider banks' risk behavior, with the dual objective of preventing tax evasion while ensuring the financial system's stability. These results are also crucial for investors and analysts in assessing the tax-related risks that investing banks may face.

LITERATURE REVIEW

Agency theory is fundamental in understanding corporate tax behavior, especially tax avoidance strategies. According to Fuadah (2022), agency theory explains the relationship between the owner (principal) and the manager (agent), where the manager is authorized to make decisions on behalf of the owner. In taxation, the agency relationship creates a potential conflict of interest, where the manager can take opportunistic actions for personal gain by minimizing tax liabilities. Conceptually, managers as agents have an incentive to reduce tax costs so that the company's net profit increases, which in turn has an impact on increasing compensation or other rewards for the manager. On the other hand, company owners generally want after-tax profit optimization through efficient tax strategies, but still within legal limits. Olanda (2024) revealed that agency theory provides a framework to explain how management's opportunistic attitude plays a role in adopting various tax avoidance techniques. In a situation of intense business competition, managers are encouraged to maintain a high level of profit, and one of the main strategies is aggressive tax planning to reduce the company's tax burden. This reflects agency problems, where the interests of managers can conflict with the interests of owners who prioritize long-term sustainability (Tang, 2017).

In line with the understanding of agency theory, risk and return theory also provides an important perspective in linking corporate risk-taking behavior with tax management. According to the risk and return theory perspective, the higher the risk taken by the company, the higher the potential profit or loss it faces (Badertscher et al., 2013; Hasan et al., 2023; Rego & Wilson, 2012). In relation to taxes, companies with high-risk characteristics will face large fluctuations in earnings, which cause uncertainty in future cash flows. This condition creates additional impetus for managers to conduct aggressive tax planning to reduce short and long-term liquidity pressures. Such aggressive tax planning is often reflected in the company's low effective tax rate (ETR). In effect, companies that consistently show low ETR will face increased risk, especially in the form of attention from tax authorities and other stakeholders (Blouin, 2014; Dyreng et al., 2019). This uncertainty complicates investors and analysts estimating the company's future financial condition.

High risk-taking behavior in banks, as reflected in the volatility of Return on Assets (ROA) or Return on Equity (ROE), directly impacts the tax management strategies taken by banks. Banks with high levels of volatility of earnings face greater uncertainty in generating future profits. These conditions encourage managers to take special measures, such as utilizing tax planning, to maintain stable after-tax profits. This strategy usually involves the use of tax planning mechanisms, such as delaying or accelerating the recognition of income and expenses, to manage the amount of tax payable by the company (Balakrishnan et al., 2019). This strategy then gives rise to a phenomenon known as book-tax differences, which is the difference between profit reported in the financial statements (book income) and profit according to tax provisions (taxable income). Book-tax differences themselves are divided into two forms, namely permanent differences and temporary differences. Permanent differences occur due to income or expenses that are recognized in accounting but not recognized in fiscal or vice versa, which will not permanently adjust each other. For example, interest income on government bonds that are not taxable will create a permanent difference



between accounting profit and tax profit (Hanlon & Heitzman, 2010). Meanwhile, temporary differences occur due to a mismatch in the timing of accounting and tax revenue or expense recognition, which will adjust each other in the following period, as in the case of depreciation of fixed assets.

Companies with high risk-taking tend to experience large book-tax differences due to the aggressive tax planning strategy. Research by Hutchens & Rego (2015) found that companies with large book-tax differences significantly show high effective tax volatility, which then increases tax risk and overall company risk. Large and consistent book-tax differences can increase uncertainty regarding the company's future tax liabilities, as the company may be faced with the possibility of more intensive audits by tax authorities. As a result, investors and other stakeholders will view the company as having a higher risk than other companies that have better tax transparency (Guenther et al., 2013). This confirms that risk-taking behavior will indirectly cause management to take aggressive tax strategies, which will increase corporate tax risk in the long run.

Neuman et al. (2013) developed an approach to measuring corporate tax risk before a risk event occurs by classifying companies based on the level of tax risk they face. The study found that high tax risk has a negative relationship with future cash-effective tax rates, where the relationship depends on the sustainability of the company's pre-tax profits. Companies with volatile earnings before tax tend to take tax risk to mitigate the impact of earnings volatility on after-tax earnings. Thus, the higher the volatility of corporate profits, the greater the likelihood of managers to take aggressive actions in tax planning to maintain the stability of corporate after-tax profits. In banking, financial institutions that face high earnings uncertainty will tend to take aggressive tax avoidance measures to protect their after-tax profit levels from the pressure of high earnings fluctuations.

Based on this description, it is clear that high risk-taking behavior in banking has a direct impact on fluctuations in bank financial performance and significantly affects the tax strategies adopted by banks in the face of earnings volatility. Banks with a high level of risk tend to experience great profit uncertainty, so management is encouraged to take strategic steps such as aggressive tax planning to maintain the stability of their after-tax profits. This strategic step is carried out by utilizing various available tax mechanisms, which are then reflected in the bank's low Effective Tax Rate (ETR). This mechanism is in line with agency theory, which explains that management as an agent is incentivized to take opportunistic actions, in this case, by reducing tax liabilities to optimize corporate profits. Similarly, the risk and return theory perspective reinforces the argument that banks that take high risks have greater pressure to manage their tax expenses efficiently, which then leads to a decrease in corporate income tax expense. Based on the description of the previous literature review, the following is the formulation of the hypothesis in this study.

H₁: An increase in corporate risk will reduce income tax expenses.

METHODS

Data and Sample

This study employs a secondary data analysis approach, utilizing annual and financial reports of banking companies listed on the Indonesia Stock Exchange as the primary data source. 46 banks in Indonesia were selected for analysis in this study, with data from 2004 to 2022. 566 observations were analyzed, comprising 72 from state-owned banks and 494 from non-state-owned banks. The data were collected from the companies' annual reports in question, which were obtained from the official websites of the respective banks. Additionally, data were sourced from the Indonesia Stock Exchange website, which facilitated in-depth analysis of these banks' tax behavior and financial risks. This study uses a purposive sampling method with



several selection criteria that are determined systematically. The sample consists of banking companies listed on the Indonesia Stock Exchange during 2004-2022 and not delisted during the observation period. Researchers only include banks with complete and consistently accessible annual financial data and tax information. These criteria ensure adequate data quality to measure the research variables accurately.

Variable Operationalisation

The operationalization of variables is shown in Table 1 below.

Table 1 Variable Operationalisation

Variable	Operationalization
Dependent Variables	
Effective Tax Rate (ETR)	ETR is calculated by dividing total income tax expenses by pre-tax income. In this analysis, ETR is operationalized to assess the tax expenses relative to income subject to tax and expressed as a percentage. This calculation provides an overview of the proportion of the company's income tax expenses (Efendi, 2020; Hanlon & Heitzman, 2010).
Independent Variables	
First Proxy of Banking Risk-Taking Behavior (SDROA)	The first proxy for bank risk-taking behavior is the Standard Deviation of ROA (SDROA) for t, t-1, and t-2, which was used to measure the variability of bank asset profitability over the last three years. SDROA gives an idea of the fluctuations in asset performance, which may indicate the level of risk the bank takes. Higher variability in ROA may indicate a higher level of risk-taking, as it signals instability in income from assets (Kasman & Kasman, 2015; Saif-Alyousfi et al., 2020). $the \sqrt{\frac{\sum_{t-2}^t (ROA_{it} - \overline{ROA})^2}{n - 1}}$
Second Proxy of Banking Risk-Taking Behavior (SDROE)	The second proxy for bank risk-taking behavior is the Standard Deviation of ROE (SDROE) for t, t-1, and t-2, used to measure the variability of a bank's return on equity over the same period. Similar to SDROA, SDROE provides insight into how return to shareholders fluctuates, which could reflect risk-taking by management. Greater variability in ROE may indicate riskier investment or operational strategies, often correlated with more aggressive yield-seeking or the use of higher leverage (Kasman & Kasman, 2015; Saif-Alyousfi et al., 2020). $\sqrt{\frac{\sum_{t-2}^t (ROE_{it} - \overline{ROE})^2}{n - 1}}$
Firm Level – Control Variable	
Net Interest Margin (NIM)	NIM is calculated by subtracting interest expenses from interest income and dividing by total interest-earning assets. It is operationalized as a percentage to show how effectively a bank uses its assets to generate net interest income (Ali, 2017; Susilawati & Nurulrahmatiah, 2021).
Return on Equity (ROE)	ROE is calculated by dividing annual net income by total shareholders' equity. It is operationalized as a ratio that indicates a company's ability to generate profit from each unit of equity held by



	shareholders. ROE provides investors insight into how effectively management returns value to shareholders from invested resources (Dempsey & Sheng, 2023).
Country Level – Control Variable	
Inflation (INFGDP)	Inflation using the GDP deflator is also measured as annual percentage change, as provided by the World Bank. It differs from consumer price inflation in that it measures changes in the prices of all goods and services produced in the economy, not just those consumed by households (Le & Ngo, 2020; Petria et al., 2015).
GDP Growth (GDPGR)	GDP (Gross Domestic Product) growth is measured as an annual growth percentage and is available through the World Bank database. GDP growth is a key indicator that shows how fast a country's economy is expanding and is often used to measure overall economic health (Le & Ngo, 2020; Petria et al., 2015).

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Econometric Model

The approach used in this study is Ordinary Least Squares (OLS). The use of the Ordinary Least Squares (OLS) method in this study was chosen because OLS is an efficient estimation technique to identify the linear relationship between dependent and independent variables in continuous panel data. OLS can produce unbiased parameter estimates and is the best linear unbiased estimator (BLUE) when classical assumptions are met, such as in the absence of autocorrelation and heteroscedasticity. In addition, this model is suitable for analyzing secondary data with a cross-time and inter-firm structure, such as bank financial statements from year to year. Researchers have also conducted multicollinearity, heteroscedasticity, and autocorrelation correction tests to ensure the validity of the OLS model used. The following is the regression model used to determine the effect of bank risk-taking behavior on the effective tax rate.

$$ETR_{i,d} = \beta_0 + \beta_1 SDROA_{i,d} + \beta_2 \varphi_{i,d} + \epsilon,$$

$$ETR_{i,d} = \beta_0 + \beta_1 SDROE_{i,d} + \beta_2 \varphi_{i,d} + \epsilon,$$

The dependent variable in this study is the effective tax rate (ETR). While the independent variable is bank risk-taking behavior (with the proxies SDROA and SDROE in the operationalization of variables). The variable $\varphi_{i,d}$ is a control variable consisting of Net Interest Margin (NIM), Return on Equity (ROE), Inflation (INFGDP), and GDP Growth (GDPGR).

RESULTS AND DISCUSSIONS

Descriptive Statistics

In the descriptive statistical analysis conducted on Indonesian banking data (Table 2). The descriptive analysis of 566 observations shows that the Effective Tax Rate (ETR) averages 26.14 percent with a standard deviation of 11.04 percent, indicating moderate variation in the effective tax expenses across banks.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ETR	566	26.143	11.044	0	98.1
SDROA	566	.417	.397	.059	1.346
SDROE	566	4.53	4.178	.619	13.704
NIM	566	20.786	10.206	4.8	36.4
ROE	566	13.662	10.866	.36	32.98
INFGDP	566	6.42	4.71	-.402	18.15
GDPGR	566	4.792	1.946	-2.066	6.345



Source: Processed by the author

The main variables representing risk-taking behavior, namely Standard Deviation of Return on Assets (SDROA) and Standard Deviation of Return on Equity (SDROE), have average values of 0.417 and 4.53, respectively. In addition, the average Net Interest Margin (NIM) of 20.79 percent reflects the relative efficiency of banks in generating net interest income. On the other hand, Return on Equity (ROE) shows the ability to manage capital with an average of 13.66 percent, indicating that banks can provide returns to shareholders. Macroeconomic variables such as inflation (INFGDP) and GDP growth (GDPGR) show average values of 6.42 percent and 4.79 percent respectively, indicating moderate macroeconomic stability during the observation period.

Correlation Coefficient

Some important findings have been revealed in the correlation analysis to examine the relationship between Effective Tax Rate (ETR) and risk-taking behavior (Table 3). The variable SDROA has a significant negative correlation with ETR ($r = -0.092$; $p < 0.05$), indicating that the greater the volatility of return on assets, the lower the effective tax expenses borne by banks. SDROE is also significantly negatively correlated with ETR ($r = -0.083$; $p < 0.05$), which reinforces the finding that variability in return on equity is associated with more aggressive tax management practices. The robust correlation between SDROA and SDROE ($r = 0.706$; $p < 0.01$) reflects that these measures describe banks' financial risk.

Table 3. Correlation Matrix

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ETR	1.000						
(2) SDROA	-0.092** (0.028)	1.000					
(3) SDROE	-0.083** (0.048)	0.706*** (0.000)	1.000				
(4) NIM	-0.311*** (0.000)	0.032 (0.449)	0.020 (0.627)	1.000			
(5) ROE	-0.232*** (0.000)	-0.055 (0.190)	0.143*** (0.001)	0.618*** (0.000)	1.000		
(6) INFGDP	0.084** (0.046)	0.196*** (0.000)	0.194*** (0.000)	0.078* (0.062)	0.027 (0.527)	1.000	
(7) GDPGR	-0.073* (0.081)	0.027 (0.514)	0.074* (0.078)	0.141*** (0.001)	0.145*** (0.001)	0.504*** (0.000)	1.000

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Processed by the author

NIM shows a significant negative correlation with ETR ($r = -0.311$; $p < 0.01$), suggesting that banks with high net interest margins tend to reduce their tax expenses. In contrast, ROE negatively correlates with ETR ($r = -0.232$; $p < 0.01$), suggesting that high return on capital performance does not always go hand in hand with large tax contributions. INFGDP has a significant positive correlation with ETR ($r = 0.084$; $p < 0.05$), which could indicate that inflation contributes to an increase in the effective tax expenses. GDPGR also has a weak negative relationship with ETR ($r = -0.073$; $p < 0.1$), which suggests that higher economic growth could potentially lower the tax expenses of banks.

Multicollinearity Test

The multicollinearity analysis results show that all independent variables in the regression model do not experience serious multicollinearity problems, as reflected by the Variance Inflation Factor (VIF) values that are well below the common threshold of 10 (shown in Table 4). In Panel 1, which uses the Standard Deviation of Return on Assets (SDROA) as a



proxy for bank risk-taking behavior, the highest VIF value is found in the ROE variable at 1.65, followed by NIM at 1.64. Meanwhile, SDROA, as the main variable, shows the lowest VIF of 1.06. The average VIF in this model is 1.43, which indicates no high correlation between independent variables, so the model's validity is maintained.

Table 4. Variance Inflation Factor

Panel 1. Impact of bank risk-taking behavior on effective tax rate (with SDROA proxy).			Panel 2. Impact of bank risk-taking behavior on effective tax rate (with SDROE proxy).		
Variable	VIF	1/VIF	Variable	VIF	1/VIF
ROE	1.65	0.606736	ROE	1.69	0.59143
NIM	1.64	0.610332	NIM	1.65	0.606967
INFGDP	1.41	0.710696	INFGDP	1.4	0.713145
GDPGR	1.38	0.723698	GDPGR	1.38	0.726497
SDROA	1.06	0.947491	SDROE	1.07	0.930933
Mean VIF	1.43		Mean VIF	1.44	

Source: Processed by the author

Panel 2, which uses the Standard Deviation of Return on Equity (SDROE) as a proxy for risk, also shows a similar pattern. The highest VIF value is found for ROE at 1.69 and NIM at 1.65, while SDROE shows the lowest VIF value at 1.07. With an average VIF of 1.44, it can be concluded that the variables in this model have a low level of interrelationship with each other. The consistently low VIF values in both panels support the reliability of the regression estimation results, as there are no independent variables that distort the parameter estimates due to high linear relationships.

Regression Results

The regression results in this study show that bank risk-taking behavior measured by Standard Deviation of Return on Assets (SDROA) has a significant negative effect on the Effective Tax Rate (ETR) in the overall model and the non-SOE bank group (shown in Table 5). In the first model that includes the entire sample, SDROA shows a coefficient of -3.373 with a significance level of 5% ($p < 0.05$), which indicates that an increase in asset risk correlates with a decrease in effective tax expenses. A similar result emerges in the third model, which only includes non-SOE banks, with a coefficient of -3.593 and is significant at the 5% level. In contrast, the second model (SOE banks) shows no statistical significance on this variable.

Table 5. Effect of bank risk-taking behavior on effective tax rate (a proxy for bank risk-taking = SDROA)

	Model (1) Full Sample	Model (2) SOE	Model (3) NONSOE
SDROA	-3.373** (-2.26)	-0.745 (-0.23)	-3.593** (-2.22)
NIM	-0.289*** (-5.05)	-0.508*** (-2.69)	-0.273*** (-4.49)
ROE	-0.0628* (-1.67)	0.00600 (0.05)	-0.0806* (-1.86)
INFGDP	0.447*** (3.83)	0.263 (1.00)	0.439*** (3.36)



GDPGR	-0.680* (-1.80)	0.238 (0.40)	-0.708* (-1.69)
_CONS	34.80*** (15.24)	35.36*** (9.71)	34.86*** (13.90)
<i>N</i>	566	72	494
<i>R</i> ² -Adj	0.126	0.308	0.114
<i>F</i> -Stat	12.91	6.829	10.23
<i>Prob</i> > <i>F</i>	0.0000	0.0000	0.0000

Processed by the author

This table presents the results of a robust Ordinary Least Squares (OLS) regression analysis investigating the impact of banking risk-taking behavior on effective tax rates. The analytical model employed in this study is an OLS regression model: $ETR_{i,d} = \beta_0 + \beta_1 SDROA_{i,d} + \beta_2 \varphi_{i,d} + \epsilon$. The variable $\varphi_{i,d}$ is a control variable consisting of Net Interest Margin (NIM), Return on Equity (ROE), Inflation (INFGDP), and GDP Growth (GDPGR). The table includes regression coefficients and t-statistics $\left(\frac{b}{t_{stat}}\right)$. Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.

The Net Interest Margin (NIM) variable is consistently negatively significant in all three models, with a significance level of 1%, suggesting that interest income efficiency is related to tax expense reduction strategies. In contrast, Return on Equity (ROE) is only negatively significant in the overall and non-SOE models, suggesting that increased return on equity may encourage more aggressive tax management. Macroeconomic variables such as inflation (INFGDP) show a significant positive effect in the first and third models, indicating that an increase in inflation may encourage an increase in ETR. However, GDP growth (GDPGR) shows a significant negative relationship in the two models, indicating that high economic growth can reduce the bank's tax expenses. All models show significant F-statistic values ($p < 0.01$), indicating that the regression models can explain the variation in ETR well. The adjusted R-squared value is highest in the SOE bank model (0.308), followed by the complete model (0.126) and non-SOE (0.114), indicating differences in predictive ability between groups.

The regression analysis results in Table 6 show that bank risk-taking behavior proxied through Standard Deviation of Return on Equity (SDROE) significantly negatively affects the Effective Tax Rate (ETR) in the model of the entire sample and the group of non-state-owned banks. In the first model, SDROE has a coefficient of -0.267 with a significance level of 5% ($p < 0.05$), which indicates that an increase in the variability of return on equity tends to reduce the bank's effective tax expenses. A similar result is shown in the third model (non-SOE), with a coefficient of -0.325 and significant at the same level. In contrast, in the second model, which only includes state-owned banks, SDROE does not significantly affect ETR. All models have significant F-statistic values ($p < 0.01$), confirming the feasibility of the regression models. The adjusted R-squared value is highest in the SOE bank model (0.319). In contrast, the overall and non-SOE models show values of 0.121 and 0.112, respectively, illustrating the variation in predictive ability between bank groups.

Table 6. Effect of bank risk-taking behavior on an effective tax rate (a proxy for bank risk-taking = SDROE)

	Model (1) Full Sample	Model (2) SOE	Model (3) NONSOE
SDROE	-0.267** (-2.01)	0.238 (0.85)	-0.325** (-2.30)



NIM	-0.315*** (-5.43)	-0.467** (-2.34)	-0.300*** (-4.92)
ROE	-0.0269 (-0.66)	-0.0275 (-0.18)	-0.0410 (-0.89)
INFGDP	0.433*** (3.61)	0.139 (0.52)	0.427*** (3.22)
GDPGR	-0.649* (-1.72)	0.454 (0.82)	-0.676 (-1.61)
_CONS	34.59*** (14.86)	33.32*** (9.91)	34.76*** (13.64)
<i>N</i>	566	72	494
<i>R²-Adj</i>	0.121	0.319	0.112
<i>F-Stat</i>	11.26	6.594	8.847
<i>Prob>F</i>	0.0000	0.0000	0.0000

Processed by the author

“This table presents the results of a robust Ordinary Least Squares (OLS) regression analysis investigating the impact of banking risk-taking behavior on effective tax rate. The analytical model employed in this study is an OLS regression model: $ETR_{i,d} = \beta_0 + \beta_1 SDROE_{i,d} + \beta_2 \varphi_{i,d} + \epsilon$. The variable $\varphi_{i,d}$ is a control variable consisting of Net Interest Margin (NIM), Return on Equity (ROE), Inflation (INFGDP), and GDP Growth (GDPGR). The table includes regression coefficients and t-statistics $\left(\frac{b}{t_{stat}}\right)$. Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.”

The regression analysis results in Table 7 show the differences in the impact of bank risk-taking behavior on the effective tax rate (ETR) under non-pandemic and COVID-19 pandemic conditions. In model 1 (non-pandemic conditions), the SDROA variable has a negative coefficient of -2.984. It is significant at the 5% level, which means that an increase in bank asset volatility tends to reduce ETR. However, in pandemic conditions (Model 2), the SDROA variable does not show a significant effect, although the coefficient remains negative. Meanwhile, the SDROE variable in pandemic conditions (Model 4) has a significant negative effect with a coefficient of -0.873 at the 5% significance level, which indicates that during a pandemic, the volatility of equity returns becomes more influential in reducing ETR than in non-pandemic conditions (Model 3).

The Net Interest Margin (NIM) variable consistently has a significant negative effect on ETR in both non-pandemic and pandemic conditions, with a minimum significance level at the 5% level. This suggests that the efficiency of bank interest margin management is stably related to efforts to reduce tax expenses, regardless of economic conditions. In contrast, Return on Equity (ROE) only has a significant negative effect at the 10% level in pandemic conditions (model 2), while in non-pandemic conditions, no significant effect is found. This indicates that during a pandemic, return on capital becomes more relevant in determining a bank's tax strategy.

Inflation (INFGDP) consistently shows a positive and significant coefficient in all models, both pandemic and non-pandemic, which means that an increase in inflation generally



increases the effective tax expenses of banks. Economic growth (GDPGR) shows different results across conditions: insignificant in non-pandemic conditions but significantly negative in pandemic conditions (coefficients of -5.215 and -5.418 in models 2 and 4). This suggests that in a difficult economic situation such as a pandemic, declining economic growth is significantly associated with increased aggressiveness of banks in reducing their tax expenses. All models show significant F-statistic values with probabilities below 1%, which ensures that the models have a high statistical feasibility. The Adjusted R-squared values range from 0.121 to 0.198, indicating that the regression models can explain the variation in ETR moderately amidst the complexity of the factors involved.

Table 7. Effect of bank risk-taking behavior on the effective tax rate

Source: Processed by the author

	Model (1) Non-Pandemic Conditions	Model (2) Pandemic Conditions	Model (3) Non-Pandemic Conditions	Model (4) Pandemic Conditions
SDROA	-2.984** (-2.10)	-3.950 (-0.88)		
SDROE			-0.175 (-1.32)	-0.873** (-2.27)
NIM	-0.275*** (-4.48)	-0.312** (-2.24)	-0.293*** (-4.61)	-0.355*** (-2.84)
ROE	-0.0414 (-1.06)	-0.206* (-1.85)	-0.0150 (-0.36)	-0.0872 (-0.69)
INFGDP	0.462*** (3.44)	3.496* (1.96)	0.441*** (3.23)	3.572** (2.10)
GDPGR	-0.232 (-0.23)	-5.215** (-2.30)	-0.210 (-0.21)	-5.418** (-2.45)
_CONS	32.04*** (6.70)	30.16*** (7.37)	31.67*** (6.60)	31.36*** (7.77)
<i>N</i>	452	114	452	114
<i>R</i> ² -Adj	0.129	0.165	0.121	0.198
<i>F</i> -Stat	11.07	4.196	11.04	4.025
<i>Prob</i> > <i>F</i>	0.0000	0.0000	0.0000	0.0000

Processed by the author

“This table presents the results of a robust Ordinary Least Squares (OLS) regression analysis investigating the impact of banking risk-taking behavior on the effective tax rate. The analytical model employed in this study is an OLS regression model: $ETR_{i,d} = \beta_0 + \beta_1 SDROA_{i,d} + \beta_2 \varphi_{i,d} + \epsilon$ and $ETR_{i,d} = \beta_0 + \beta_1 SDROE_{i,d} + \beta_2 \varphi_{i,d} + \epsilon$. The variable $\varphi_{i,d}$ is a control variable consisting of Net Interest Margin (NIM), Return on Equity (ROE), Inflation (INFGDP), and GDP Growth (GDPGR). The table includes regression coefficients and t-statistics $\left(\frac{b}{t_{stat}}\right)$. Robust regressions have been presented to account for heteroscedasticity and autocorrelation. The significance levels are denoted by ***, **, and *, corresponding to 1%, 5%, and 10% respectively.”



The regression analysis results showing that the effect of bank risk-taking behavior on the Effective Tax Rate (ETR) differs between pandemic and non-pandemic conditions can be clarified through the factor of changes in tax regulations during the crisis. From 2020 to 2022, the Indonesian government reduced the Corporate Income Tax (PPh) rate from the original 25% to 22%, which aims to provide fiscal stimulus amid the economic slowdown due to the COVID-19 pandemic. The reduced tax rate automatically lowers the overall corporate tax expenses, giving companies more room to implement tax planning strategies to maximize fiscal benefits during the period. In such a situation, banks that experience high earnings volatility, reflected through increased risk of return on equity (SDROE), tend to take greater opportunities to take advantage of the lower tax rate policy. Therefore, the finding that the SDROE variable has a significant negative effect on ETR during the pandemic is in line with the logic that banks with high equity risk have an additional incentive to reduce their tax expenses aggressively in periods of lower tax rates.

On the other hand, the asset risk variable (SDROA) did not significantly affect the pandemic, possibly due to the different sensitivity of asset and equity risk to tax reduction strategies in the rate incentive period. This can be explained by the earnings volatility characteristic of assets, which tends to have a longer-term impact on corporate profits than equity earnings volatility, which is more immediate from a shareholder perspective. Therefore, in periods of lower tax rates, banks focus more on equity risk, which is more closely related to investor-perceived performance. In addition, lower tax rates also increase the likelihood of book-tax differences, as banks have greater flexibility in managing their fiscal earnings through aggressive tax planning to maximize tax savings. In this context, the pandemic period and the reduction in corporate income tax rates simultaneously create a conducive environment for banks to implement aggressive strategies in managing their taxes, especially through an increase in temporary differences.

Discussion

The hypothesis testing result shows that banking risk-taking behavior negatively affects tax income expenses, meaning banks with higher risk levels tend to pay lower effective taxes. Hence, this finding is in line with Hypothesis 1. The regression results of this study reveal that all proxies of bank risk-taking behavior show a negative relationship with corporate tax expenses, indicating that banks with higher risk behavior tend to have lower effective tax rates. Greater volatility in financial performance triggers the need to utilize available tax reduction opportunities to maintain liquidity and profitability. Further discussion on the significant effect of risk-taking behavior in non-SOE banks, in contrast to SOE banks, suggests that different ownership and regulatory structures may influence risk management and tax compliance decisions. SOE banks, often more supervised and have stricter regulations, may be less flexible in implementing aggressive tax management strategies, unlike non-SOE banks, which may have more latitude to take financial and tax risks. In addition, pandemic conditions and the reduction in corporate income tax rates during 2020-2022 enlarge the space for banks to manage the recognition of their tax expenses. In times of crisis, banks may feel the need to further strengthen their financial position through savings in the tax area, which is in line with the need to maintain financial stability in the face of heightened economic uncertainty.

Research by Badertscher et al. (2013) and Rego & Wilson (2012) have identified that low tax expenses are associated with increased firm-specific risk. This is consistent with the finding that banks with high-risk behavior may use more aggressive tax management as compensation for the instability faced. This phenomenon is amplified during pandemic and non-pandemic conditions, indicating that crises or external instability encourage banks to further reduce their tax expenses, in line with the need to maintain financial stability. Furthermore, the significant difference between SOE and non-SOE banks in this study suggests



that ownership structure and regulatory framework influence risk management and tax compliance decisions. This is consistent with the analysis by Hutchens & Rego (2015), who found that tax uncertainty resulting from accumulating unrecognized tax benefits can increase corporate risk. SOE banks that are often more supervised may have less room for aggressive tax management, unlike non-SOE banks with more opportunities to take financial and tax risks. The importance of understanding the impact of risk-taking behavior on tax liabilities is also confirmed by Guenther et al. (2013), who showed a strong positive correlation between tax risk and firm risk. These results suggest that an aggressive tax reduction approach may improve the firm's overall risk profile while reducing short-term tax expenses.

The results of this study indicate that bank risk-taking behavior negatively affects the effective tax expenses, meaning that the higher the risk taken by the bank, the lower the effective tax rate. This condition is caused by the tendency of banks with high risk to implement aggressive tax management practices to compensate for the financial instability faced. Banks with high-profit fluctuations face cash flow uncertainty, so they utilize every available tax-saving opportunity to maintain their liquidity and profitability position. Banks that face large risks strategically minimize tax expenditures, for example, through aggressive tax avoidance or more effective tax expense preparation strategies, to reduce financial pressure due to earnings volatility. This is in line with agency theory, which states that managers as agents have an incentive to reduce tax expenses as part of an effort to maintain firm value amid high-risk conditions.

In addition, this study found that differences in bank ownership (SOE and non-SOE) also affect the relationship between risk-taking behavior and effective tax expenses. SOE banks with strict supervision tend to have more limited room for maneuver in conducting aggressive tax management, unlike non-SOE banks with greater freedom to make decisions related to financial and tax risks. Strict regulations and supervision of state-owned banks have implications for higher tax compliance than non-SOE banks, thus reducing flexibility in utilizing tax avoidance strategies. This finding is further strengthened in both pandemic and non-pandemic conditions, indicating that crises or economic uncertainty increase banks' incentives to reduce tax expenses. In a crisis, banks tend to strengthen cash reserves and maintain financial stability through tax savings because taxes are a cost component that can be strategically controlled in the short term. This explains why bank risk-taking behavior is closely related to tax reduction strategies during economic uncertainty.

The results show that the difference in the effect of bank risk-taking behavior on the Effective Tax Rate (ETR) between the pandemic and non-pandemic periods can be understood more comprehensively through changes in corporate income tax rates during the period. The reduction in corporate income tax rate from 25% to 22% in 2020 to 2022 directly provides additional fiscal space for banks to optimize tax planning strategies to reduce their effective income tax expenses. This condition encourages banks that experience high earnings volatility due to high equity risk (SDROE) to actively utilize temporary differences opportunities in tax planning, such as accelerating asset depreciation or establishing bad debt reserves, which can increase book-tax differences.

CONCLUSIONS

This study examines the effect of banks' risk-taking behavior on corporate income tax expenses. This study concludes that risk-taking behavior by banks negatively affects the income tax expense recognized in the financial statements. The higher the level of risk indicated by the SDROA and SDROE variables, the lower the income tax expense reflected in the effective tax rate (ETR). These results suggest that banks with high-performance volatility tend to optimize tax planning space to maintain liquidity and profitability. The difference in effect between SOE



and non-SOE banks indicates that ownership structure affects flexibility in managing tax expenses. Non-SOE banks, free from strict regulations, have greater opportunities to strategically adjust their tax expense recognition. On the other hand, state-owned banks tend to show higher compliance due to stricter supervision. During the pandemic and the reduction in corporate income tax rates, banks have additional room to adjust tax expense recognition through temporary difference-based planning. This condition strengthens the negative relationship between risk and ETR, especially on equity risk.

The theoretical implication of this study lies in the deepened understanding of the relationship between banks' risk-taking behavior and their tax management. The findings add evidence to the literature that higher financial risk tends to encourage more aggressive tax management practices, a perspective that links risk management theory with tax behavior. From a practical perspective, the results of this study provide important insights for bank management, particularly in non-SOE banks that have more flexibility in their tax management strategies. This knowledge is important to ensure that the risk and tax policies adopted comply with regulations and support the bank's financial sustainability in the long run.

Recommendations for stakeholders, such as investors, tax authorities, banking supervisors, and bank management, are the importance of transparency in reporting tax risks and practices. Investors should consider tax risk as a key factor in their investment decisions. In contrast, tax authorities and banking supervisors may need to tighten their oversight of aggressive tax reduction strategies to avoid excessive risk-taking that could undermine financial stability. As a limitation, this study is limited to data from the banking sector only and may not reflect other sectors with different risk dynamics. In addition, this study uses aggregate data, which may hide important variations between individual banks about tax practices and risk-taking. Future research needs further investigation on how ownership structure affects the relationship between risk-taking behavior and tax policy. Assessing the differences between state-owned and private banks may provide a more nuanced understanding of how regulation and ownership moderate risk-taking and tax management practices. This research could involve more in-depth comparative analysis across bank types under various economic and regulatory conditions to identify best practices and potential areas of improvement in supervisory and tax policies.

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