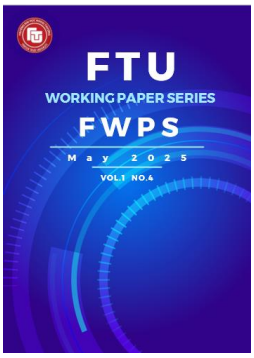

Working Paper 2025.1.4.1

- Vol. 1, No. 4

VAI TRÒ ĐIỀU TIẾT CỦA SỞ HỮU NỘI BỘ VÀ CHẤT LƯỢNG KIỂM TOÁN TRONG MỐI QUAN HỆ GIỮA HÀNH VI TRÁNH THUẾ CỦA DOANH NGHIỆP VÀ RỦI RO TRƯỢT GIÁ CỔ PHIẾU

Nguyễn Phan Hoàng Bảo[1], Tường Bảo Ngọc, Nguyễn Hoàng Bảo, Nguyễn Phúc Khang

Sinh viên K60 Ngân hàng và Tài chính quốc tế

Trường Đại học Ngoại Thương Cơ sở II tại TP. Hồ Chí Minh – Việt Nam

Tóm tắt

Nghiên cứu này tìm hiểu mối quan hệ giữa hành vi tránh thuế của doanh nghiệp và rủi ro sụt giảm giá cổ phiếu của các công ty niêm yết trên thị trường chứng khoán Việt Nam. Đồng thời, nghiên cứu cũng xem xét vai trò của chất lượng kiểm toán và sở hữu nội bộ trong việc điều tiết mối quan hệ này. Cụ thể, nghiên cứu đánh giá liệu sự có mặt của các công ty kiểm toán hàng đầu thế giới (Big 4) có giúp giảm tác động của tránh thuế đến rủi ro sụt giảm giá cổ phiếu hay không, cũng như cách sở hữu nội bộ ảnh hưởng đến mối quan hệ này. Thông qua phân tích dữ liệu thực nghiệm, nghiên cứu mang đến cái nhìn sâu sắc hơn về tác động của tránh thuế đối với sự biến động giá cổ phiếu, đồng thời làm rõ mức độ ảnh hưởng của chất lượng kiểm toán và sở hữu nội bộ trong việc giảm nhẹ hoặc khuếch đại rủi ro. Kết quả nghiên cứu cung cấp những thông tin quan trọng cho các nhà hoạch định chính sách, nhà đầu tư và công tác quản trị doanh nghiệp tại các thị trường mới nổi.

Từ khóa: tránh thuế doanh nghiệp, rủi ro trượt giá cổ phiếu, chất lượng kiểm toán, sở hữu nội bộ, thị trường mới nổi, Việt nam.

THE MODERATING ROLES OF INSIDER OWNERSHIP AND AUDITOR QUALITY IN THE RELATIONSHIP BETWEEN CORPORATE TAX AVOIDANCE AND STOCK PRICE CRASH RISK

Abstract

This study investigates the relationship between corporate tax avoidance and stock price crash risk among publicly listed firms in the Vietnamese stock market. Additionally, it examines the moderating effects of audit quality and insider ownership on this relationship. Specifically, the

[1] Tác giả liên hệ, Email: k60.2112343014@ftu.edu.vn

study explores whether the presence of Big 4 auditors mitigates the impact of tax avoidance on stock price crash risk and whether insider ownership influences this relationship. By analyzing empirical data, the research provides insights into the role of tax avoidance in stock price instability and the extent to which audit quality and insider ownership act as mitigating or amplifying factors. The findings offer valuable implications for policymakers, investors, and corporate governance practices in emerging markets.

Keywords: corporate tax avoidance, stock price crash risk, auditor quality, insider ownership, emerging markets, Vietnam.

1. Introduction

A stock price crash is typically defined as a sharp and sudden decline in a stock's value, often occurring unexpectedly and causing significant financial losses for investors, while also negatively impacting economic growth (Alp et al., 2022; Wang et al., 2021). These incidents have gained increasing public attention, especially following major corporate scandals such as WorldCom, Enron, and Xerox, as well as the 2008 financial crisis (Balachandran et al., 2020).

Research has identified various factors contributing to crash risk, one of which is corporate tax avoidance. Kim et al. (2011) suggest that tax avoidance allows managers to manipulate earnings and conceal negative information (Desai and Dharmapala, 2006; Kim et al., 2011).

In Vietnam, multiple stock price crashes have been associated with insufficient information transparency and a weak legal framework, which allow companies to take advantage of these weaknesses. In the context of the Vietnamese market, tax avoidance is a prevalent practice among firms, which can significantly increase asymmetric information and raise the risk of stock crashes. Consequently, Vietnam offers an ideal environment to investigate the effects of corporate tax avoidance on stock price crash risk and to formulate effective risk mitigation strategies for both companies and the government.

This study aims to contribute to existing research in several ways. While the topic has been widely studied, there is limited research focusing on emerging economies where economic conditions differ significantly. Our results largely support those of Kim et al. (2011); however, we find that insider ownership can intensify the positive relationship between tax avoidance and future crash risk in Vietnam. Additionally, the impact of auditor quality on this relationship remains inconclusive. Our goal is to provide a clearer understanding of how tax avoidance affects stock price crash risk in Vietnam's emerging stock market, offering a new perspective on the topic.

2. Literature review

2.1. Stock price crash risk

The phenomenon of a stock price crash refers to an event in which a company's share price rapidly declines over a short period (Xiao et al., 2023). The risk associated with such an event is termed stock price crash risk, and this issue has been a significant concern for researchers, investors, corporate managers, and regulators since the last century (Xiao et al., 2023). A

substantial portion of recent empirical studies on the factors contributing to crash risk is based on the agency theory framework proposed by Jin and Myers (2006). This framework posits that, in an environment where information is asymmetrical between corporate insiders and external stakeholders, managers may deliberately conceal negative information to benefit themselves. As insiders, managers can engage in what is known as "bad news hoarding," whereby they suppress negative news to maximize their compensation, safeguard their employment, and minimize legal risks associated with the disclosure of unfavorable information (Kothari et al., 2009). Scholars generally agree that stock price crash risk stems from the tendency of managers to withhold bad news over an extended period, which leads to the accumulation of negative information. This successful concealment of bad news creates an asymmetric distribution of stock returns (Hutton et al., 2009; Kothari et al., 2009). Eventually, this accumulated bad news reaches a tipping point, after which it is disclosed to the market all at once, resulting in a dramatic drop in stock price.

Financial reporting opacity refers to situations where a firm's financial disclosures lack clarity and openness. This often occurs when negative information is intentionally delayed or when reporting is done using overly complex methods, making it challenging for investors and analysts to accurately assess the firm’s financial condition. Such opacity has become a foundational concept in research examining the risk of stock price crashes (Habib et al., 2017).

Beyond this, scholars have identified additional mechanisms contributing to price crashes. For example, models developed by Bleck and Liu (2007) and Benmelech et al. (2010) highlight how managerial incentives to conceal unfavorable information may precede a crash. According to Bleck and Liu (2007), when bad news is suppressed, investors are unable to differentiate between strong and weak projects, resulting in the continued support of unviable ventures. Eventually, these failing projects generate negative cash flows, triggering sharp declines in stock prices.

Similarly, the model by Hong and Stein (2003) emphasizes the role of divergent investor beliefs in contributing to price crashes. Their framework suggests that short-selling constraints in financial markets hinder the incorporation of negative information known to more pessimistic investors. If optimistic investors exit the market, pessimists become the marginal traders. As a result, previously unpriced negative information becomes apparent, leading to a sudden price collapse. While much of the existing literature draws on agency theory to explain managerial motives for withholding bad news, a stakeholder-oriented perspective suggests that differing investor expectations alone may also drive crashes in stock prices.

2.2. Corporate tax avoidance

One method used to manage earnings and obscure unfavorable financial information is corporate tax avoidance. This refers to the legal strategies firms employ to lower their tax obligations by exploiting gaps or uncertainties in tax regulations. In essence, it involves minimizing tax liabilities within the bounds of the law, as commonly described in academic literature (Gebhart et al., 2017).

Hanlon and Heitzman (2010) provide a broad definition of tax avoidance, describing it as any action that reduces explicit taxes. This aligns with Dyreng et al. (2008), who similarly consider tax avoidance to encompass any practice that lowers a firm's effective cash tax rate. In line with Hanlon and Heitzman's (2010) interpretation, this study adopts a comprehensive view of tax avoidance—one that does not distinguish between legal and potentially illegal practices. This inclusive approach allows for the assessment of all activities aimed at reducing tax liabilities, collectively categorized under tax avoidance (Gebhart et al., 2017).

2.3. How tax avoidance might influence stock price crash risk

Existing literature generally agrees that tax avoidance is indicated by positive book-tax differences—meaning discrepancies between income reported to investors and that reported to tax authorities—as well as by low effective tax rates (Kim et al., 2011). Numerous scholars have explored both the factors driving tax avoidance and its potential outcomes (Desai & Dharmapala, 2009b; Graham, 2003; Shackelford & Shevlin, 2001).

Kim et al. (2011) note that much of the empirical research on tax avoidance centers around the agency conflict between managers and shareholders. This perspective is grounded in agency theory, which posits that managers, whose goals may not always align with those of investors, may use tax avoidance strategies to further their own interests. Desai and Dharmapala (2009b) explore this issue by examining how managerial opportunism—specifically, the diversion of corporate resources—can stem from tax avoidance practices. In an earlier study, Desai and Dharmapala (2006) also contend that the complexity of certain tax avoidance schemes can create opportunities for managers to engage in self-serving behaviors, such as earnings manipulation and related-party transactions.

Their research further demonstrates that stronger equity-based incentives can mitigate tax avoidance in firms with weaker corporate governance structures. These findings align with Desai's (2005) earlier work, which provides robust evidence that tax avoidance can indeed enable opportunistic managerial actions. As a result, it can be argued that tax avoidance and managerial resource diversion may reinforce each other in practice.

In the context of research examining how corporate tax avoidance impacts the stock market, Desai and Dharmapala (2009a) argue that tax avoidance can yield net benefits for firms with high levels of institutional ownership. In such settings, strong oversight and effective governance help limit managerial opportunism, allowing tax avoidance to enhance firm value. In contrast, Hanlon and Slemrod (2009) report that markets may respond unfavorably to announcements about a firm's participation in tax shelter schemes. They suggest this negative reaction reflects investor concerns that tax shelters might be used to mask managerial misconduct or manipulate financial performance.

From an agency theory standpoint, recent research suggests that tax avoidance may serve as a strategic tool for managers to conceal unfavorable information and exaggerate financial results. Kothari et al. (2009) propose that such behavior may be driven by career-related concerns, which, although broadly defined, primarily relate to how disclosures could affect current financial incentives and long-term career outcomes, including promotions, job

opportunities, or even job security. Ball (2009) further argues that non-financial motivations—such as the desire to expand managerial influence or maintain peer recognition—can also compel managers to obscure poor performance. Supporting this, Kothari et al. (2009) provide empirical evidence that managers often delay the release of bad news. This tendency to withhold negative information has been identified as a major contributor to stock price crashes (Hutton et al., 2009; Jin and Myers, 2006).

The argument that corporate tax avoidance can elevate the risk of stock price crashes, as originally proposed by Kim et al. (2011), is based on the observation that tax avoidance often serves as a form of earnings management. Through the use of aggressive tax strategies and complex tax planning, managers may obscure unfavorable information in financial statements. According to Kim et al. (2011), the intricate and opaque nature of tax-related transactions enables managers to mask bad news under the guise of reducing corporate tax liabilities. This reduces the transparency of financial reporting, making it harder for investors and stakeholders to assess the firm's true performance.

Such reduced transparency facilitates the concealment of negative information—commonly referred to as bad news hoarding. However, this concealment can only be sustained up to a certain point. Once the cost or difficulty of withholding bad news becomes too great, the previously suppressed information is released all at once, resulting in a sharp and sudden drop in stock price—a crash. This study posits that tax avoidance is positively associated with the risk of stock price crashes, as it may offer managers opportunities to conceal negative information and exaggerate financial performance. Accordingly, we formally test the following hypothesis in its alternative form.

H1: *Firms engaging in corporate tax avoidance are more likely to experience an increased risk of future stock price crashes.*

2.4. The moderating role of auditor quality

Desai and Dharmapala (2009a) suggest that in environments where strong monitoring and control mechanisms limit managerial opportunism, tax avoidance may indeed enhance value of the firm instead of sabotaging it. They further highlight that although tax avoidance can improve a firm's post-tax value, this advantage may be offset by managerial rent-seeking, particularly in firms with weak governance. Consequently, the positive effect of tax avoidance on firm value tends to be more evident in companies with robust governance frameworks. Given that managerial opportunism is effectively restrained in such firms, one can argue that the influence of tax avoidance on stock price crash risk should be less significant. Therefore, firms with superior governance and oversight should exhibit this pattern. A key approach to curbing managerial opportunism is through external monitoring by high-quality external auditors (Ferguson et al., 2024).

Auditing functions as an external governance mechanism that shapes the relationship between tax avoidance and stock price crash risk, with auditor quality playing a crucial role in this dynamic. As a process, auditing entails a thorough evaluation of a company's financial statements, including tax-related accounts, to ensure compliance, accuracy, and transparency.

High-quality auditors recognized for their expertise, independence and extensive resources strengthen this process by meticulously assessing intricate tax avoidance strategies, such as aggressive transfer pricing or the use of tax shelters, which could otherwise obscure financial vulnerabilities. By validating tax provisions and requiring comprehensive disclosures of uncertain tax positions, these auditors help mitigate information asymmetry and restrict managers' ability to withhold negative information, a key contributor to crash risk. Dunn and Mayhew (2004) propose that auditor expertise signals a firm's commitment to improved financial transparency. Similarly, Robin and Zhang (2015) identify an empirically significant negative relationship between auditor industry specialization and stock price crash risk, indicating that firms audited by industry specialists generally experience lower crash risk. They attribute this to the role of high-quality auditors in enhancing disclosure practices, reducing accounting opacity, and mitigating information asymmetry by serving as intermediaries who provide investors with more reliable financial information.

Thus, it can be reasonably argued that the increased transparency stemming from the rigorous oversight of high-quality auditors may help mitigate the negative impact of tax avoidance on stock price crash risk. Specifically, these auditors enforce external monitoring that discourages managerial incentives to engage in tax avoidance practices. In a study on the Korean market, Lim et al. (2016) suggest that stock price crash risk declines when a firm transitions from a non-Big 4 to a Big 4 auditor, particularly following the widespread adoption of International Financial Reporting Standards (IFRS) in the country. Similarly, Cheng et al. (2015), using data from China, find that firms with political connections do not demand stringent auditor oversight, and thus more likely opt for lower-quality auditors to conceal earnings management and opportunistic behavior. This finding further underscores the significance of high-quality auditors.

To determine what constitutes a high-quality auditor, Andreou et al. (2016) define auditors with substantial industry expertise as those holding more than one-third of an industry's total market share in sales. Meanwhile, Lim et al. (2016) differentiate between Big 4 and non-Big 4 auditors, assessing each group's impact on stock price crash risk. In the context of Vietnam, Pham et al. (2017) assert that Big 4 auditors provide superior audit quality compared to their non-Big 4 counterparts. Building on the findings of Pham et al. (2017), our study also focuses specifically on the role of Big 4 auditors, categorizing them as high-quality auditors.

Accordingly, we propose the following hypothesis in its alternative form.

H2: The presence of Big 4 auditors in the firm weakens the relationship between corporate tax avoidance and stock price crash risk.

2.5. The moderating role of insider ownership

According to Vietnam's Securities Law (Law No. 54/2019/QH14, Article 4, Clause 45), corporate insiders are defined as individuals holding significant positions in the governance and management structure of enterprises, public funds, or public securities investment companies. Specifically, this includes:

a) Insiders of an enterprise, comprising the Chairman of the Board of Directors or Chairman of the Members' Council or Chairman of the company, members of the Board of Directors or Members' Council, legal representatives, General Director (Director), Deputy General Director (Deputy Director), Chief Financial Officer, Chief Accountant, and other equivalent managerial positions elected by the General Meeting of Shareholders or appointed by the Board of Directors, Members' Council, or Chairman of the company; Head and members of the Supervisory Board (Controllers), members of the Internal Audit Committee; corporate secretary, person in charge of corporate governance, and authorized person for information disclosure;

b) Insiders of a public fund or public securities investment company, comprising members of the Fund Representative Board, members of the Board of Directors of the public securities investment company, operators of the public fund, operators of the public securities investment company, and insiders of the fund management company.

While there exist variations in the definition of insider ownership across different countries, the fundamental idea remains the same: it represents the extent to which individuals with substantial control over a firm's operations and strategic decisions also maintain equity stakes in the firm (Jensen and Meckling, 1976; Fama and Jensen, 1983). This alignment of ownership and control is crucial in understanding corporate governance structures and the potential agency conflicts within firms.

Huang et al. (2013) suggests that high levels of insider ownership can result in managerial entrenchment, where managers prioritize their own interests over those of shareholders. In such cases, they may engage in tax avoidance as a means of obscuring firm performance issues. Greater insider ownership grants insiders increased authority over corporate decision-making while simultaneously diminishing external oversight. This concentrated control can heighten information asymmetry, particularly regarding complex and less transparent financial practices such as corporate tax avoidance. Empirical evidence further indicates that higher insider ownership is associated with greater information opacity, which can hinder investors' ability to efficiently interpret earnings-related information (Ho et al., 2024). Furthermore, when insiders hold a substantial equity stake, they face reduced external accountability from shareholders or the board of directors (Morck et al., 1988; Shleifer and Vishny, 1997). This concentration of power fosters an environment where insiders may act opportunistically. Tax avoidance activities, often characterized by complexity and opacity, provide insiders with mechanisms to manipulate earnings, withhold negative financial information, and engage in other forms of managerial opportunism. The strong control they exercise makes it more difficult for external parties to detect these practices in a timely manner.

Building on this argument, we posit that a high concentration of insider ownership may incentivize opportunistic behaviors, specifically tax avoidance in this context. Therefore, we propose the following hypothesis in its alternative form.

H3: The presence of significant insider ownership strengthens the positive association between corporate tax avoidance and stock price crash risk.

3. Research methodology

To test our hypothesis H1, we employ the following model:

$$CRASHRISK_t = \beta_0 + \beta_1 TAXAVOIDANCE_{t-1} + \sum_{q=2}^{m} \beta_q (q_{th} CONTROL_{t-1}) + \varepsilon_t \quad (1)$$

Building on the studies by Chen et al. (2001) and Kim et al. (2010), we define $CRASHRISK_t$ using two key variables: $NCSKEW_t$ and $DUVOL_t$, which act as proxies for stock price crash risk during year t. Our primary independent variable, $TAXAVOIDANCE_{t-1}$, is measured using $disBTD_{t-1}$, representing the discretionary total book-tax difference. The subscript t-1 indicates that tax avoidance is assessed in the prior period. We employ this framework to explore the moderating effects relevant to our research question.

Our initial hypothesis suggests that firms engaging more heavily in tax avoidance are at a greater risk of stock price crashes. Consequently, we expect the coefficient β1 to be statistically significant and positive, implying a direct relationship between tax avoidance and crash risk.

To control for potential confounding factors, we incorporate several variables based on prior research, including $NCSKEW_{t-1}$, $SIZE_{t-1}$, ROA_{t-1}, LEV_{t-1}, MB_{t-1}, ROA_{t-1}, $SIGMA_{t-1}$, $DTURN_{t-1}$, $ABACC_{t-1}$, RTN_{t-1}. These control variables are drawn from the works of Kim et al. (2011), Chen et al. (2001), Hutton et al. (2009), and Dechow & Dichev (2002), ensuring a comprehensive approach to account for different influences on stock crash risk. To mitigate industry- and time-specific effects, we apply a fixed effects regression model with controls for year and industry code.

For empirical analysis, we collect data from 775 publicly listed firms on the Ho Chi Minh and Hanoi stock exchanges covering the period 2009–2020. Price, financial, and operational data, along with financial statements, are sourced from FiinPro. We exclude firms that lack sufficient data, were delisted or suspended, traded fewer than 26 weeks per year, or operate in the financial sector. This filtering process results in a dataset of 6,872 firm-year observations, which is further reduced to 4,579 observations after addressing outliers.

3.1. Measures of stock price crash risk

This study uses two proxies to measure stock price crash risk for empirical analysis: the negative conditional skewness, referred to as NCSKEW; and the down-to-up volatility, referred to as DUVOL.

In this study, we apply the NCSKEW formula established by Kim et al. (2011) and Chen et al. (2001) to quantify crash risk. The first step involves estimating firm-specific weekly returns for 52 weeks, using the following equation:

$$r_{j,\tau} = \alpha_1 + \beta_{1,j} r_{m,\tau-2} + \beta_{2,j} r_{m,\tau-1} + \beta_{3,j} r_{m,\tau} + \beta_{4,j} r_{m,\tau+1} + \beta_{5,j} r_{m,\tau+2} + \varepsilon_{j,\tau} \quad (2)$$

where $r_{j,\tau}$ represents the return of firm j in week τ and $r_{m,\tau}$ is the return on the value-weighted market for the same week. In order to address non-synchronous trading effects, as identified by Dimson (1979), lead and lag terms of the market index return are integrated in equation (2).

Subsequently, we calculate firm-specific weekly returns for firm j in week τ as the natural logarithm of one plus the residual from equation (2):

$$w_{j,\tau} = ln\left(1 + e_{j,\tau}\right) \quad (3)$$

NCSKEW is determined by computing the negative value of the third moment of firm-specific weekly returns for each year and standardizing it by the cube of the standard deviation of firm-specific weekly returns. Specifically, for each firm **j** in year **t**, NCSKEW is calculated as presented in equation (4):

$$NCSKEW_{t,\tau} = -\frac{\left[n(n-1)^{\frac{3}{2}}\left(\sum w_{j,\tau}^3\right)\right]}{\left[n(n-1)(n-2)\left(\sum w_{j,\tau}^2\right)^{\frac{3}{2}}\right]} \quad (4)$$

where $w_{j,\tau}$ represents the weekly return specific to the firm as defined in equation (3), and n stands for the total number of weekly returns in year t. The multiplication by -1 ensures that higher values indicate a greater risk of stock price crashes.

Following Chen et al. (2001), we adopt DUVOL as the second measure of stock crash risk. To compute DUVOL for each firm j in fiscal year t, we first categorize firm-specific weekly returns into two groups: 'down' weeks, where returns fall below the annual average, and 'up' weeks, where returns exceed the annual average. Next, we calculate the standard deviation of weekly returns separately for both groups. Finally, DUVOL is obtained by taking the natural logarithm of the ratio of the standard deviation of returns during 'down' weeks to that during 'up' weeks:

$$DUVOL_{j,\tau} = log\ log\left(\frac{\left[(n_u-1)\left(\sum_{Down} w_{j,\tau}^2\right)\right]}{\left[(n_d-1)\left(\sum_{Up} w_{j,\tau}^2\right)\right]}\right) \quad (5)$$

where n_u represents the number of 'up' weeks and n_d denotes the number of 'down' weeks within year t, respectively. A higher DUVOL value indicates an increased risk of a stock crash.

3.2. Measures of tax avoidance

Tax avoidance is quantified through discretionary total book-tax differences. The derivation of this variable follows a structured process. Initially, we determine each firm's total book-tax differences (Total BTD) by applying the formula outlined below:

$$Total\ BTD = pre-tax\ Income - \frac{Current\ Tax\ Expenditure}{Statutory\ Tax\ Rate} \quad (6)$$

where taxable income (equal to current tax expense divided by statutory tax rate) is subtracted from pre-tax income (or "book income") in the financial statement.

Healy and Wahlen (1999) define earnings management as the practice of managers exercising judgment in financial reporting to shape financial outcomes, which can consequently affect book-tax differences. For instance, when managers seek to inflate financial earnings, this, assuming all other factors remain unchanged, results in an increase in BTD. To address the impact of earnings management, we adopt the methodology introduced by Desai (2003) and further refined by Lee et al. (2015). We estimate a regression model in which Total BTD,

adjusted by lagged total assets to account for firm size, serves as the dependent variable. The independent variable is total accruals, also adjusted by lagged total assets, as accruals are considered an indicator of earnings management activity.

$$\frac{Total\ BTD_t}{Lagged\ Total\ Asset_t} = \beta_0 + \beta_1 * \frac{TA_t}{Lagged\ Total\ Asset_t} + \varepsilon_t \quad (7)$$

The residual $\varepsilon_t+\beta_0$ from the regression above represents the component of book-tax differences that is unrelated to earnings management. This portion, referred to as "discretionary" book-tax differences, serves as a proxy for tax avoidance in year t. In the regression model (1), the independent variable is expressed as disBTD at time t-1.

3.3. Control variables

We incorporate control variables aligned with those used in the research by Kim et al. (2011). $SIZE_{t-1}$ is included to capture firm size, ROA_{t-1} to reflect profitability, and LEV_{t-1} to account for leverage. To address the idea that growth stocks are more susceptible to future price crashes, we introduce MB_{t-1}, following the findings of Chen et al. (2001) and Hutton et al. (2009). Chen et al. (2001) also highlight that stocks with higher volatility are more prone to crashing. To control for this effect, we use $SIGMA_{t-1}$ as a measure of stock volatility. Additionally, these authors establish that the detrended average monthly stock turnover, represented by $DTURN_{t-1}$, is positively linked to future crash risk. To account for the persistence of return skewness, we include the lagged value of NCSKEW, recognizing that firms with high return skewness in t-1 tend to exhibit similar patterns in t. We also introduce $ABACC_{t-1}$ to capture earnings management, as it reflects financial statement opacity, which increases crash risk, as suggested by Hutton et al. (2009). This variable follows the modified Jones model proposed by Dechow and Dichev (2002). Finally, RTN_{t-1} is added to control for the tendency of stocks with strong past returns to experience crashes, consistent with the findings of Chen et al. (2001).

3.4. Measuring moderating effects

3.4.1. Measuring the effect of auditor quality

To test our second hypothesis, we included a dummy variable BIG4 in our regression analysis. This is to capture whether the company examined has its financial statements / operations audited by a Big 4 audit firm. We hypothesize that the presence of a reputable Big 4 audit firm will positively influence the transparency of a company's reporting, and thus mitigate the effect of tax avoidance on stock crash risk. The dummy variable is coded as follow:

1: for firms audited by a Big 4 audit firm

0: if otherwise

3.4.2. Measuring the effect of insider ownership

To test our third and fourth hypothesis, we divide the sample into 2 smaller subsamples: one with significant insider ownership (>10%), and one with insignificant amount of insider ownership (<10%). Regarding the rationale for choosing 10% as the threshold percentage for significant insider ownership, we first employ descriptive statistics, which show that the mean

percentage of insider ownership is roughly 11.4% and the median is about 4.4%. We adopt the 10% threshold in order to be grounded in both conventional practice and statistical reasoning. While our descriptive statistics show that the median insider ownership is 4.4%, setting the threshold at this level would classify a large proportion of firms as having 'significant' insider presence, potentially diluting the intended distinction. Instead, the 10% threshold ensures that firms identified as having substantial insider ownership stand apart from those with only moderate levels of insider involvement. Moreover, this choice aligns closely with the mean insider ownership of 11.4%, striking a balance between strictness and practical relevance. By adopting this threshold, we ensure that our classification captures firms where insider holdings are more likely to be strategically influential rather than incidental. By doing this, we can subsequently assess whether the large presence of insider ownership within a company exacerbates or alleviates the effect of tax avoidance on stock price crash risk. We carry out the analysis by including a dummy variable INSOWN_dum in our fixed effect regression model; the dummy variable is coded as follow:

1: for firms with more than 10% insider ownership

0: for firms with less than 10% insider ownership

By doing this, we aim to examine the moderating effect of insider ownership in the relationship between corporate tax avoidance and stock price crash risk.

Table 1 summarizes the variables used in this study. The label 'expected sign' in the third column refers specifically to the expected sign of the coefficient of each variable, generated from the fixed effect regression for testing hypothesis H1.

Table 1. Variable description

Dependent variables		
Variable	**Description**	**Exp. Sign**
$NCSKEW_t$	The negative skewness coefficient computed by negating the negative of the third moment of firm firm-specific weekly returns for each sample year divided by the standard deviation of firm specific weekly returns raised to the third power.	
$DUVOL_t$	The variable is the natural logarithm of the ratio of the standard deviation in "down" weeks to that in "up" weeks, where "down" weeks are characterized by returns below the annual mean and "up" weeks by returns above it.	
Independent variables		
$disBTD_{t-1}$	The regression of the Total BTD scaled by lagged total assets on total accruals	+
Control variable		

$SIZE_{t-1}$	The natural logarithm of the firm's total asset in year *t-1*	+/-
LEV_{t-1}	The ratio of debt to equity in year *t-1*	+/-
MB_{t-1}	The market to book ratio in year *t-1* calculated as the ratio of market value of equity over book value of equity	+
ROA_{t-1}	The ratio of net income over total assets in year *t-1*	+/-
$NCSKEW_{t-1}$	The lagged NCSKEW	+
$SIGMA_{t-1}$	Standard deviation of firm-specific weekly return over the fiscal year period *t-1*	+
$DTURN_{t-1}$	The average monthly share turnover for the fiscal year *t-1* minus the average monthly share turnover for the previous fiscal year *t-2*	+
$ABACC_{t-1}$	The absolute value of the estimated residuals from the modified Jones model in year *t-1*	+
RTN_{t-1}	The arithmetic average of firm-specific weekly returns in year *t-1*	+

Source(s): Authors' own work

4. Results

4.1. Descriptive statistic

Table 2. Summary statistics

Variable	No. of Obs.	Mean	Median	Std. Dev.	Min	Max
NCSKEW	4,579	-0.124	-0.121	0.860	-2.412	2.429
DUVOL	4,579	-0.091	-0.106	0.729	-2.045	2.215
$disBTD_{t-1}$	4,579	0.001	-0.002	0.044	-0.137	0.194
$DTURN_{t-1}$	4,579	-0.144	-0.027	0.916	-3.984	3.288
$NCSKEW_{t-1}$	4,579	-0.092	-0.087	0.836	-2.412	2.429
$SIGMA_{t-1}$	4,579	0.055	0.05	0.023	0.001	0.316
RTN_{t-1}	4,579	-0.171	-0.129	0.666	-7.225	2.776
$SIZE_{t-1}$	4,579	26.223	26.061	1.704	21.717	33.59
MB_{t-1}	4,579	1.044	0.812	0.805	0.166	4.765
LEV_{t-1}	4,579	0.487	0.509	0.218	0.043	0.904
ROA_{t-1}	4,579	0.059	0.046	0.077	-0.852	0.783
$ABACC_{t-1}$	4,579	0.102	0.074	0.097	2.26e-6	0.734

$NCSKEW_t$ and $DUVOL_t$ serve as key indicators in examining stock price crash risk, capturing the likelihood of price collapses in the year t. Meanwhile, disBTDt-1 reflects discretionary total book-tax differences that can help to offer insights into firms' tax-related financial reporting choices. Firm size $SIZE_{t-1}$ is measured as the natural logarithm of market capitalization; LEV_{t-1} denotes the firm's financial leverage, calculated as the ratio of total liabilities to total assets. ROA_{t-1}, which represents profitability, is the ratio of net income to total assets. MB_{t-1} reflects market valuation by measuring the ratio of equity to market value of equity. Market dynamics are captured by $SIGMA_{t-1}$ which measures the standard deviation of lagged firm-specific weekly returns; and RTN_{t-1}, which represents average firm-specific weekly return in prior year. $DTURN_{t-1}$ is the change in average monthly share turnover between the last two years which is to help assess trading activity. $ABACC_{t-1}$ quantifies earnings management by capturing the absolute value of abnormal accruals based on the adjusted Jones model.

Table 3. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) NCSKEW	1											
(2) DUVOL	0.916***	1										
(3) $disBTD_{t-1}$	0.036**	0.037***	1									
(4) $DTURN_{t-1}$	0.117***	0.129***	0.021	1								
(5) $NCSKEW_{t-1}$	-0.095***	-0.123***	-0.007	-0.093***	1							
(6) $SIGMA_{t-1}$	0.157***	0.173***	-0.096***	0.125***	0.002	1						
(7) RTN_{t-1}	0.113***	0.136***	0.015	0.074***	-0.556***	-0.114***	1					
(8) $SIZE_{t-1}$	-0.084***	-0.081***	0.081***	0.023	-0.062***	-0.324***	0.029**	1				
(9) MB_{t-1}	0.161***	0.190***	0.108***	0.125***	-0.051***	-0.108***	-0.005	0.152***	1			
(10) LEV_{t-1}	-0.006	-0.001	-0.093***	0.024*	-0.005	0.063***	0.003	0.184***	-0.001	1		
(11) ROA_{t-1}	0.041***	0.046***	0.367***	0.047***	-0.035***	-0.195***	0.022*	-0.040***	0.470***	-0.254***	1	
(12) $ABACC_{t-1}$	0.032**	0.033**	-0.048***	-0.029*	0.025*	0.068***	-0.070***	-0.061***	0.029**	-0.001	0.009	1

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

Source(s): Authors' own work

Table 2 presents the summary statistics for the key variables in the study. The measures of stock price crash risk, NCSKEW and DUVOL, have mean values of -0.124 and -0.091, respectively, suggesting that, on average, firms do not exhibit extreme negative stock returns. However, their relatively large standard deviations (0.86 for NCSKEW and 0.729 for DUVOL) indicate substantial variation across firms, with some experiencing significant stock price crashes.

The tax avoidance proxy, disBTD, has a mean value close to zero (0.001), implying that firms in the sample exhibit minimal discretionary book-tax differences, with limited variation across firms. In contrast, financial leverage (LEV_{t-1}) exhibits considerable dispersion, ranging from 0.043 to 0.904. This suggests that while some firms operate with relatively low debt levels, others maintain highly leveraged positions, potentially reflecting industry-specific financing structures, access to credit markets, or firm-level risk preferences. Firm performance, as measured by ROA_{t-1}, shows substantial variation, with an average of 5.9% but a wide range spanning from -0.852 to 0.783. This highlights the disparity between firms that generate consistent profits and those experiencing financial distress. Additionally, the negative mean stock return (RTN_{t-1}) of -0.171 suggests a general downward trend in stock prices within the sample period.

Table 3 reports the Pearson correlation coefficients among the variables. The stock price crash risk measures, NCSKEW and DUVOL, exhibit significant positive correlations (denoted by two or three asterisks at the 5% and 1% significance levels, respectively) with SIGMA, RTN, SIZE, ROA, ABACC, MB. This suggests that firms with higher stock return volatility, larger past returns, greater firm size, stronger profitability, higher trading volume turnover, and greater discretionary accruals—often associated with growth-oriented firms—are more prone to stock price crashes. Conversely, NCSKEW and DUVOL show significant negative correlations with disBTD at the 5% and 1% significance levels, respectively, supporting Hypothesis H1, though this does not imply a causal relationship. Furthermore, the strong correlation between NCSKEW and DUVOL (0.92) confirms that both measures largely capture the same underlying risk of stock price crashes.

4.2. Regression results

4.2.1. The relationship between tax avoidance and stock price crash risk

The regression results presented in Table 4 provide strong empirical support for Hypothesis H1. Specifically, the positive and statistically significant coefficients for disBTD, at the 1% significance level, in both regression models (with NCSKEW and DUVOL as dependent variables) suggest that firms engaging in higher levels of tax avoidance exhibit a greater chance of experiencing stock price crashes. This aligns with the findings of Kim et al. (2011), reinforcing the notion that discretionary book-tax differences (disBTD) are positively and significantly associated with stock price crash risk. The estimated coefficients for disBTD are 0.731 (NCSKEW) and 0.637 (DUVOL), with respective t-statistics of 2.65 and 2.76, underscoring the robustness of the results. These findings suggest that aggressive tax strategies

may increase firms' vulnerability to future stock price crashes through the reduced transparency and risks associated with such financial decisions.

Beyond tax avoidance, the results also reveal significant relationships between several control variables and stock price crash risk. At the 1% significance level, DTURN, SIGMA, RTN, SIZE, and MB are all positively associated with stock price crash risk. The positive and significant coefficient for DTURN suggests that fluctuations in trading volume serve as a key predictor of price crashes, consistent with the argument of Chen et al. (2001) that variations in trading activity reflect investors' divergent beliefs. This further lends empirical support to the theoretical model of Hong and Stein (2003), which posits that differences in investor expectations contribute to market instability.

Furthermore, the positive coefficients of SIGMA and RTN indicate that firms with higher past stock returns and greater stock return volatility are more susceptible to stock price crashes. Specifically, both SIGMA and RTN exhibit strong positive coefficients, significant at the 1% level. These findings align with prior research (Chen et al., 2001; Kim et al., 2011) and suggest that overly optimistic investor expectations based on past stock performance and volatility may lead to mispricing, ultimately increasing the risk of sharp price corrections. Overall, these results provide compelling

Table 4. The impact of tax avoidance on stock price crash risk

VARIABLES	NCSKEW	DUVOL
$disBTD_{t-1}$	0.731***	0.637***
	(2.65)	(2.76)
$DTURN_{t-1}$	0.0555***	0.0535***
	(4.03)	(4.81)
$NCSKEW_{t-1}$	0.007	0.005
	(0.33)	(0.27)
$SIGMA_{t-1}$	6.353***	6.124***
	(9.46)	(11.32)
RTN_{t-1}	0.247***	0.258***
	(10.27)	(12.68)
$SIZE_{t-1}$	-0.035***	-0.027***
	(-3.01)	(-2.79)
MB_{t-1}	0.223***	0.214***
	(10.05)	(10.59)
LEV_{t-1}	-0.002	-0.005
	(-0.17)	(-0.54)

VARIABLES	NCSKEW	DUVOL
ROA_{t-1}	-0.554**	-0.599***
	(-2.32)	(-2.95)
$ABACC_{t-1}$	0.192	0.166
	(1.32)	(1.34)
_cons	0.315	0.150
	(0.94)	(0.55)
N	4,579	4,579
R-sq	0.119	0.157
Year FE	YES	YES
Industry FE	YES	YES

Source(s): Authors' own work

$NCSKEW_t$ and $DUVOL_t$ serve as key indicators in examining stock price crash risk, capturing the likelihood of price collapses in the year t. Meanwhile, disBTDt-1 reflects discretionary total book-tax differences that can help to offer insights into firms' tax-related financial reporting choices. Firm size $SIZE_{t-1}$ is measured as the natural logarithm of market capitalization; LEV_{t-1} denotes the firm's financial leverage, calculated as the ratio of total liabilities to total assets. ROA_{t-1}, which represents profitability, is the ratio of net income to total assets. MB_{t-1} reflects market valuation by measuring the ratio of equity to market value of equity. Market dynamics are captured by $SIGMA_{t-1}$ which measures the standard deviation of lagged firm-specific weekly returns; and RTN_{t-1}, which represents average firm-specific weekly return in prior year. $DTURN_{t-1}$ is the change in average monthly share turnover between the last two years which is to help assess trading activity. $ABACC_{t-1}$ quantifies earnings management by capturing the absolute value of abnormal accruals based on the adjusted Jones model.

Robust z-statistics are in parentheses:

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

evidence of the link between tax avoidance and stock price crash risk, while also highlighting the influence of market dynamics and firm characteristics in shaping such risks

Conversely, MB has a strong positive association with stock price crash risk at the 1% level. This suggests that growth firms—characterized by high market valuations relative to book value—are more susceptible to price crashes, indicating that overvalued firms may be more prone to corrections when investor sentiment shifts or when earnings expectations fail to materialize. Leverage (LEV) also plays a critical role in shaping stock price crash risk.

The coefficients in both regression models suggest greater likelihood of price crash for firms larger in size, which aligns with the view of Hutton et al. (2009) that larger firms are more

affected by market movements and negative news. Finally, the significant coefficients of MB and ROA can be attributed to the potential overvaluation of stocks, which may lead to a correction and a subsequent crash when the accumulated negative information is suddenly released to the market.

4.2.2. The moderating role of Big 4 audit firms

Table 5 presents the regression results for two distinct subsamples: the first with no recorded audit by a Big 4 auditing firm (1), and the second with recorded audit by a Big 4 auditing firm (2). In the first subsample (1), the coefficients β_1 remain positive and weakly significant. Additionally, in the second subsample (2), these coefficients exhibit statistical insignificance.

After adding the moderating variable, the R-squared value of the regression did not decrease, suggesting that the overall explanatory power of the model remains strong. As can be seen, the subset with Big 4 audits shows low significance for the coefficients of both measures of crash risk at the 10% significance level, while the subset without Big 4 audits exhibits no statistical significance for these coefficients. This suggests that either there is multicollinearity between the dummy variable for Big 4 audit and the tax avoidance variable or that the dummy variable inherently does not affect the relationship between tax avoidance and stock crash risk.

In order to understand the reduction in statistical significance, we carried out a multicollinearity test for the regression and found no significant correlation between the dummy variable and the variable for tax avoidance, and thus concluded that the effect of tax avoidance is not absorbed by the addition of the dummy variable.

Tests for multicollinearity suggest that the loss of significance is not due to the correlation between the dummy variable and the variable for tax avoidance but rather the lack of a meaningful moderating effect of the Big 4 dummy. Our results show no evidence of the Big 4 dummy acting as a moderator. Therefore, we cannot conclude that auditor quality affects the relationship between tax avoidance and stock crash risk in this context.

Table 5. Regression results of subsample with Big 4 auditing

	(1)	**(1)**	**(2)**	**(2)**
VARIABLES	**DUVOL**	**NCSKEW**	**DUVOL**	**NCSKEW**
	(without recorded audit by a Big 4 firm)		**(with recorded audit by a Big 4 firm)**	
$disBTD_{t-1}$	0.495*	0.640*	0.485	0.281
	(1.69)	(1.78)	(1.00)	(0.48)
$DTURN_{t-1}$	0.0603***	0.0601***	0.0574**	0.0665**
	(4.58)	(3.68)	(2.22)	(2.18)

VARIABLES	(1) DUVOL	(1) NCSKEW	(2) DUVOL	(2) NCSKEW
	(without recorded audit by a Big 4 firm)		(with recorded audit by a Big 4 firm)	
$NCSKEW_{t-1}$	0.0113	0.0182	-0.0444	-0.0660
	(0.50)	(0.67)	(-1.26)	(-1.50)
$SIGMA_{t-1}$	5.556***	5.678***	6.372***	6.945***
	(8.72)	(7.46)	(4.64)	(4.18)
RTN_{t-1}	0.261***	0.253***	0.271***	0.250***
	(10.67)	(8.59)	(5.72)	(4.07)
$SIZE_{t-1}$	-0.0302**	-0.0452***	-0.0678***	-0.0752***
	(-2.35)	(-2.83)	(-3.84)	(-3.26)
MB_{t-1}	0.250***	0.258***	0.173***	0.171***
	(8.95)	(7.94)	(6.29)	(5.06)
LEV_{t-1}	-0.00377	0.00432	-0.0103	-0.0119
	(-0.34)	(0.32)	(-0.74)	(-0.71)
ROA_{t-1}	-1.002***	-0.896***	0.398	0.644
	(-3.80)	(-2.76)	(1.12)	(1.41)
$ABACC_{t-1}$	0.289*	0.357*	-0.194	-0.165
	(1.83)	(1.90)	(-0.75)	(-0.54)
Constant	0.261	0.592	1.357**	1.475**
	(0.73)	(1.32)	(2.54)	(2.11)
Observations	3143	3143	963	963
R-squared	0.162	0.126	0.203	0.158
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES

Source(s): Authors' own work.

$NCSKEW_t$ and $DUVOL_t$ serve as key indicators in examining stock price crash risk, capturing the likelihood of price collapses in the year t. Meanwhile, disBTDt-1 reflects discretionary total book-tax differences that can help to offer insights into firms' tax-related financial reporting choices. Firm size $SIZE_{t-1}$ is measured as the natural logarithm of market capitalization; LEV_{t-1} denotes the firm's financial leverage, calculated as the ratio of total liabilities to total assets. ROA_{t-1}, which represents profitability, is the ratio of net income to total assets. MB_{t-1} reflects market valuation by measuring the ratio of equity to market value of equity. Market dynamics are captured by $SIGMA_{t-1}$ which measures the standard deviation of lagged firm-specific weekly returns; and RTN_{t-1}, which represents average firm-specific weekly return in prior year. $DTURN_{t-1}$ is the change in average monthly share turnover between the last two years which is to help assess trading activity. $ABACC_{t-1}$ quantifies earnings management by capturing the absolute value of abnormal accruals based on the adjusted Jones model.

Robust z-statistics are in parentheses:

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

Table 6. Multicollinearity results

Variable	VIF	1/VIF
BIG4_L1	1	0.999741
disBTD_L1	1	0.999741
Mean VIF	1	

Source(s): Authors' own work.

Tests for multicollinearity suggest that the loss of significance is not due to the correlation between the dummy variable and the variable for tax avoidance but rather the lack of a meaningful moderating effect of the Big 4 dummy. Our results show no evidence of the Big 4 dummy acting as a moderator. Therefore, we cannot conclude that auditor quality affects the relationship between tax avoidance and stock crash risk in this context.

4.2.3. The moderating role of insider ownership

Table 7 presents the regression results for two distinct subsamples: the first without significant insider ownership (1), and the second with significant insider ownership (2). In the first subsample (1), the coefficients β_1 remain positive but lose significance. Notably, in the second subsample (2), coefficients β_1 exhibit high statistical significance with lower p-value.

Table 7. Regression results of subsample with significant insider ownership

VARIABLES	(1) NCSKEW	(1) DUVOL	(2) NCSKEW	(2) DUVOL
	(without significant insider ownership <10%)		(with significant insider ownership >10%)	
$disBTD_{t-1}$	0.307	0.346	1.347***	1.592***
	(1.11)	(1.07)	(3.25)	(3.22)
$DTURN_{t-1}$	0.042***	0.043***	0.068***	0.074***
	(3.17)	(2.66)	(3.45)	(3.08)
$NCSKEW_{t-1}$	-0.0205	-0.0287	0.0361	0.0518
	(-0.93)	(-1.09)	(1.27)	(1.43)
$SIGMA_{t-1}$	6.826***	7.139***	5.281***	5.156***
	(9.65)	(8.62)	(5.95)	(4.77)
RTN_{t-1}	0.245***	0.227***	0.284***	0.286***
	(9.07)	(7.33)	(9.13)	(7.38)
$SIZE_{t-1}$	-0.021*	-0.027**	-0.040**	-0.050**
	(-1.88)	(-2.06)	(-2.39)	(-2.42)
MB_{t-1}	0.190***	0.198***	0.279***	0.293***
	(7.50)	(7.36)	(7.99)	(7.31)
LEV_{t-1}	-0.002	-0.003	-0.006	0.003
	(-0.17)	(-0.23)	(-0.42)	(0.19)
ROA_{t-1}	-0.309	-0.273	-1.066***	-0.997**
	(-1.29)	(-1.02)	(-3.04)	(-2.27)
$ABACC_{t-1}$	0.299*	0.340*	-0.033	-0.046
	(1.79)	(1.72)	(-0.18)	(-0.22)
Constant	-0.0481	0.0519	0.560	0.775
	(-0.15)	(0.14)	(1.18)	(1.34)
Observations	2864	2864	1688	1688

	(1)	(1)	(2)	(2)
VARIABLES	**NCSKEW**	**DUVOL**	**NCSKEW**	**DUVOL**
	(without significant insider ownership <10%)		**(with significant insider ownership >10%)**	
R-squared	0.162	0.125	0.183	0.147
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES

Source(s): Authors' own work.

$NCSKEW_t$ and $DUVOL_t$ serve as key indicators in examining stock price crash risk, capturing the likelihood of price collapses in the year t. Meanwhile, disBTDt-1 reflects discretionary total book-tax differences that can help to offer insights into firms' tax-related financial reporting choices. Firm size $SIZE_{t-1}$ is measured as the natural logarithm of market capitalization; LEV_{t-1} denotes the firm's financial leverage, calculated as the ratio of total liabilities to total assets. ROA_{t-1}, which represents profitability, is the ratio of net income to total assets. MB_{t-1} reflects market valuation by measuring the ratio of equity to market value of equity. Market dynamics are captured by $SIGMA_{t-1}$ which measures the standard deviation of lagged firm-specific weekly returns; and RTN_{t-1}, which represents average firm-specific weekly return in prior year. $DTURN_{t-1}$ is the change in average monthly share turnover between the last two years which is to help assess trading activity. $ABACC_{t-1}$ quantifies earnings management by capturing the absolute value of abnormal accruals based on the adjusted Jones model.

Robust z-statistics are in parentheses:

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

Upon incorporating the moderating variable, the R-squared of the regression increased, underscoring the enhanced explanatory power of the model in capturing variations in stock price crash risk. This strongly suggests that insider ownership plays a crucial role in shaping stock price stability beyond the sole effect of tax avoidance, introducing an additional layer of complexity to the risk dynamics.

A shift emerges in the regression intercept, which flips from positive to negative in firms where insider ownership is below 10%. Given the mathematical formulation of NCSKEW and DUVOL, this result implies that firms with lower insider ownership inherently experience less stock price crash risk, fundamentally altering the baseline risk perception. This dramatic shift challenges conventional assumptions about ownership structures and risk exposure.

Further reinforcing this narrative, the inclusion of the insider ownership dummy variable (INSOWN_dum) reveals a seismic shift in statistical significance. Firms with substantial insider ownership (>10%) exhibit a stronger and highly significant relationship at the 1% level, providing compelling support for hypothesis H3—that tax avoidance is far more potent in triggering crash risk when insiders hold a significant stake. Conversely, the subset of firms with

low insider ownership (<10%) sees this relationship diminish into statistical insignificance, suggesting that the absence of concentrated insider control actually weakens the connection between corporate tax avoidance and crash risk.

This exposes a gap in existing literature, hinting at an overlooked yet fundamental dimension of ownership structures in determining market stability. It calls for a reassessment of how insider influence—or its absence—can reshape the risk landscape, demanding further empirical scrutiny to fully grasp its implications.

5. Conclusion

This paper explores the impact of corporate tax avoidance on stock price crash risk using data from Vietnam. Our findings indicate that tax avoidance, as measured by discretionary book-tax differences, increases crash risk, supporting both agency theory and the concept of heterogeneous investor beliefs. This highlights the negative long-term effects of short-term managerial decisions on market value.

The relationship between tax avoidance and crash risk is notably influenced by insider ownership and auditor quality. We observe that insider ownership of 10% or more strengthens the connection between tax avoidance and stock price crash risk, suggesting that insiders with significant stakes may prioritize short-term profits through aggressive tax strategies, potentially undermining long-term shareholder value. However, the impact of auditor quality is less clear. Although high-quality audits are typically expected to enhance transparency and reduce managerial opportunism, our results do not provide strong evidence that they mitigate the adverse effects of tax avoidance on stock price stability.

5.1. Limitations

No single proxy fully captures managers' behavior of hoarding bad news. Various alternatives have been suggested, each depending on the availability of financial data and different approaches to assessing corporate tax avoidance. Given the lack of a definitive method, future research should select the most appropriate measure based on the data available or consider using multiple proxies to enhance rigor and provide a more comprehensive understanding.

This study is limited by data constraints, particularly the lack of reliable and comprehensive financial data in emerging stock markets. These limitations have impacted the robustness of the findings and their relevance to other developing financial markets. The absence of essential data points has reduced the sample size for certain variables, limiting the study's ability to examine a broader range of tax avoidance indicators. Moreover, excluding firms from the finance and banking sectors may introduce selection bias, which could reduce the generalizability of the results to the wider corporate sector.

5.2. Recommendations

5.2.1. For firms

Firstly, the board of directors should enhance governance mechanisms to ensure more rigorous oversight of the CEO's actions. One effective approach could be the establishment of an internal committee tasked with evaluating managerial decisions on behalf of the board. Additionally, companies should implement comprehensive performance appraisal frameworks to systematically assess the CEO's effectiveness and leadership.

Secondly, it is imperative for managers to refrain from concealing negative information and instead foster a culture of transparency in corporate reporting. By consistently providing accurate and clear disclosures, organizations can mitigate the potential adverse effects of unfavorable information on stock price stability.

5.2.2. For investors

Investors should incorporate crash risk into their portfolio management strategies and carefully evaluate the CEO's credibility and past performance. CEOs with questionable reputations may be inclined to withhold negative information to achieve short-term gains, thereby heightening market volatility and financial risks. For investors with stakes in a company, understanding the firm's tax avoidance practices can provide valuable insights into potential financial risks, enabling them to better safeguard their interests.

Finally, investors should exercise caution when considering investments in companies with substantial insider ownership. One key consideration for investors is the potential absence of significant insider ownership, which, as highlighted by the findings, can be indicative of a firm with a lower, less pronounced risk of stock price crashes influenced by tax avoidance practices.

References

Alp, O. S., Canbaloglu, B. & Gurgun, G. (2021). "Stock liquidity, stock price crash risk, and foreign ownership". *Borsa Istanbul Review*, Vol. 22 No. 3, pp. 477–486.

Andreou, P. C., Antoniou, C., Horton, J. & Louca, C. (2016). "Corporate governance and firm-specific stock price crashes." *European Financial Management*, Vol. 22 No. 5, pp. 916–956.

Balachandran, B., Duong, H. N., Luong, H. & Nguyen, L. (2020). "Does takeover activity affect stock price crash risk? Evidence from international M&A laws". *Journal of Corporate Finance,* Vol. 64, pp. 101697.

Ball, R. (2009). "Market and political/regulatory perspectives on the recent accounting scandals." *Journal of Accounting Research*, Vol. 47 No. 2, pp. 277–323.

Benmelech, E., Kandel, E. & Veronesi, P. (2010). "Stock-based compensation and CEO (dis) incentives". *The Quarterly Journal of Economics*, Vol. 125 No. 4, pp. 1769–1820.

Bleck, A. & Liu, X. (2007). "Market transparency and the accounting regime". *Journal of Accounting Research,* Vol. 45 No. 2, pp. 229–256.

Chen, J., Hong, H. & Stein, J. C. (2001). "Forecasting crashes: Trading volume, past returns, and conditional skewness in stock prices". *Journal of Financial Economics*, Vol. 61 No. 3, pp. 345–381.

Dechow, P. M. & Dichev, I. D. (2002). "The quality of accruals and earnings: The role of accrual estimation errors". *The Accounting Review*, Vol. 77 No. 1, pp. 35–59.

Desai, M. A. (2003). "The divergence between book income and tax income". *Tax Policy and the Economy,* Vol. 17, pp. 169–206.

Desai, M. A. (2005). "The degradation of reported corporate profits". *Journal of Economic Perspectives*, Vol. 19 No. 4, pp. 171–192.

Desai, M. A. & Dharmapala, D. (2006). "Corporate tax avoidance and high-powered incentives". *Journal of Financial Economics*, Vol. 79 No. 1, pp. 145–179.

Desai, M. A. & Dharmapala, D. (2009b). "Earnings management, corporate tax shelters, and book-tax alignment". *National Tax Journal*, Vol. 62 No. 1, pp. 169–186.

Desai, M. A. & Dharmapala, D. (2009a). "Corporate tax avoidance and firm value". *Review of Economics and Statistics*, Vol. 91 No. 3, pp. 537–546.

Dunn, K. A. & Mayhew, B. W. (2004). "Audit firm industry specialization and client disclosure quality". *Review of Accounting Studies*, Vol. 9, pp. 35–58.

Dyreng, S., Hanlon, M. & Maydew, E. (2008). "Long-run corporate tax avoidance". *The Accounting Review*, Vol. 83 No. 1, pp. 61–82.

Fama, E. F. & Jensen, M. C. (1983). "Separation of ownership and control". *The journal of Law and Economics*, Vol. 26 No. 2, pp. 301-325.

Ferguson, A., Hu, C. W. & Lam, P. (2024). "Fair value of earnouts: Valuation uncertainty or managerial opportunism?" *The Accounting Review,* Vol. 99 No. 3, pp. 141–167.

Gebhart, M. S. (2017). "Measuring corporate tax avoidance – An analysis of different measures". *Junior Management Science*, Vol. 2 No. 2, pp. 43–60.

Graham, J. R. (2003). "Taxes and corporate finance: A review". *The Review of Financial Studies*, Vol. 16 No. 4, pp. 1075–1129.

Habib, A., Hasan, M. M. & Jiang, H. (2017). "Stock price crash risk: Review of the empirical literature". *Accounting and Finance,* Vol. 58 No. 1, pp. 211–251.

Hanlon, M. & Heitzman, S. (2010). "A review of tax research". *Journal of Accounting and Economics,* Vol. 50 No. 2-3, pp. 127–178.

Hanlon, M. & Slemrod, J. (2009). "What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement". *Journal of Public Economics*, Vol. 93 No. 1-2, pp. 126–141.

Healy, P. M. & Wahlen, J. M. (1999). "A review of the earnings management literature and its implications for standard setting". *Accounting Horizons*, Vol. 13 No. 4, pp. 365–383.

Ho, T. Q., Nguyen, Y. & Tran, H. (2024). "The impact of insider ownership and institutional ownership on post-earnings-announcement-drift: Evidence from Vietnam". *Research in International Business and Finance,* Vol. 70, pp. 102352.

Hong, H. & Stein, J. C. (2003). "Differences of opinion, short-sales constraints, and market crashes". *The Review of Financial Studies,* Vol. 16 No. 2, pp. 487–525.

Huang, H. H., Wang, W. & Zhou, J. (2013). "Shareholder rights, insider ownership, and earnings management". *Abacus*, Vol. 49 No. 1, pp. 46–73.

Hutton, A. P., Marcus, A. J. & Tehranian, H. (2009). "Opaque financial reports, R^2, and crash risk". *Journal of Financial Economics*, Vol. 94 No. 1, pp. 67–86.

Jensen, M. C. & Meckling, W. H. (2019). Theory of the firm: Managerial behavior, agency costs and ownership structure. *In Corporate governance,* pp. 77-132. Gower.

Jin, L. & Myers, S. (2005). "R^2 around the world: New theory and new tests". *Journal of Financial Economics*, Vol. 79 No. 2, pp. 257–292.

Kim, J.-B., Li, Y. & Zhang, L. (2011). "Corporate tax avoidance and stock price crash risk: Firm-level analysis". *Journal of Financial Economics,* Vol. 100 No. 3, pp. 639–662.

Kothari, S. P., Shu, S. & Wysocki, P. D. (2009). "Do managers withhold bad news*?" Journal of Accounting Research,* Vol. 47 No. 1, pp. 241–276.

Lee, B.B. (2015). Theories and Empirical Proxies for Corporate Tax Avoidance.

Lim, H., Kang, S. K. & Kim, H. (2016). "Auditor quality, IFRS adoption, and stock price crash risk: Korean evidence". *Emerging Markets Finance and Trade,* Vol. 52 No. 9, pp. 2100–2114.

Pham, N. K., Duong, H. N., Pham, T. Q. & Ho, N. T. T. (2017). "Audit firm size, audit fee, audit reputation, and audit quality: The case of listed companies in Vietnam". *Asian Journal of Finance & Accounting,* Vol. 9 No. 1, pp. 429–447.

Rasheed, M. S., Kouser, S. & Ling, Z. (2024). "Corporate governance and stock price crash risk: Insights from an emerging market". *Asia-Pacific Financial Markets [*Preprint].

Robin, A. J. & Zhang, H. (2015). "Do industry-specialist auditors influence stock price crash risk?" *Auditing: A Journal of Practice & Theory*, Vol. 34 No. 3, pp. 47–79.

Shackelford, D. A. & Shevlin, T. (2001). "Empirical tax research in accounting". *Journal of Accounting and Economics,* Vol. 31 No. 1-3, pp. 321–387.

Shleifer, A. & Vishny, R. W. (1997). "A survey of corporate governance". *The Journal of Finance,* Vol. 52 No. 2, pp. 737–783.

Wang, L., Zhu, W., Peng, T. & Hu, J. (2023). "Employee quality and stock price crash risk". *Asia-Pacific Journal of Accounting & Economics,* Vol. 30 No. 4, pp. 1047–1066.