Corporate tax avoidance and firm risk: What role does firm performance play?

Fatma Bougacha[1,a] and Mouna Guedrib [a]

[a] *Faculty of Economics and Management of Sfax, University of Sfax, Tunisia*

Abstract

Research Question: Can firm performance moderate the relationship between tax avoidance and firm risk in the French context?

Motivation: Previous studies have investigated the impact of tax avoidance on corporate risk, yet consensus remains elusive. These discrepancies suggest that findings may be influenced by specific company characteristics, such as performance. Guedrib and Bougacha (2024) discovered a negative relationship between tax avoidance and corporate risk using annual tax avoidance as a measure. Our study adopts the approach of Dyreng *et al.* (2008) by examining a long-term measure to mitigate distortions arising from tax accrual effects and short-term fluctuations.

Idea: This study seeks to evaluate the impact of tax avoidance on firm risk and investigate how firm performance might moderate this dynamic.

Data: Our research examines 301 observations of French companies listed on the CAC 40 index. We analyze data from 2010 to 2022, collected from 2008, using DATASTREAM database.

Tools: This research employs the feasible generalized least squares (FGLS) method. Firm performance is evaluated using both metrics, while tax avoidance is estimated using the long-run cash effective tax rate.

Findings: The research indicates that firm performance plays a moderating role in how tax avoidance affects firm risk. Accounting performance coupled with tax avoidance typically decreases firm risk, whereas market performance combined with tax avoidance tends to increase it. Further analysis reaffirms these findings, particularly among firms exhibiting high tax risk.

---

[1] *Corresponding author*: Fatma Bougacha, Faculty of Economics and Management, Sfax University, Tunisia, Email: fatma.bougacha@fsegs.usf.tn, ORCID: https://orcid.org/0000-0002-8332-4793

Contribution: This study underscores the importance for investors to consider both firm performance and tax avoidance as interconnected indicators to enhance decision-making processes.

Keywords: Tax Avoidance, Firm risk, Firm performance, Long-run Cash ETR, CAC 40.

JEL codes: M41, M42

1. Introduction

Given the dynamic nature of tax regulations across different time periods and geographical regions, tax avoidance continues to capture growing attention from researchers and professional organizations. In their 2003 study, Kirchler *et al.* surveyed 252 participants, including tax agents, business students, corporate lawyers, and small business owners. The findings indicated that tax avoidance was viewed as both legally and morally acceptable, associated with the intent to save taxes, intelligence, and effective strategy. It was specifically connected to the acceptance of tax reduction, use of tax allowances, legal methods of tax reduction, principles of horizontal justice, and exploitation of tax loopholes. In the same thread, the findings of Guenther *et al.* (2017) suggest that low effective tax rates primarily stem from a company's ability to take advantage of benign tax-favored transactions within its operations, rather than variations in managers' inclinations to minimize the firm's tax liabilities by taking on risky tax positions.

Despite that, Dyreng *et al.* (2019) observe that tax avoidance encompasses a variety of techniques, including income shifting across jurisdictions, investing in tax-exempt municipal bonds, utilizing tax shelters, leveraging net operating losses, and engaging in complex financial arrangements, as evidenced in existing literature. These methods represent a wide spectrum of approaches aimed at reducing tax liabilities, ranging from relatively benign actions like investing in tax-exempt municipal bonds to more aggressive strategies like utilizing tax shelters. Tax authorities frequently scrutinize such practices and may successfully challenge them, leading to the forfeiture of the tax benefits initially gained through avoidance. This point was raised by Hanlon and Heitzman (2010) in their literature review on tax avoidance: "If tax avoidance represents a continuum of tax planning strategies where something like municipal bond investments are at one end (lower explicit tax, perfectly legal), then terms such as 'noncompliance,' 'evasion,' 'aggressiveness,' and 'sheltering' would be closer to the other end of the continuum". Consequently, it is important to acknowledge both the potential benefits and ethical considerations surrounding tax avoidance to make informed decisions.

Although the abundant studies on the issue of tax avoidance, there are still research avenues that remain unexplored. Tax avoidance might lead to costs for businesses by altering their operational, financing, or investment decisions. These changes could potentially create uncertainties about the company's future cash flows, as noted by Hutchens *et al.* (2023). Prior research has explored the effects of tax avoidance on firm risk, but findings have not reached a consensus (Guedrib & Bougacha, 2024; Hutchens *et al.*, 2023; Cao *et al.*, 2021; Krapl *et al.*, 2020; Guenther *et al.*, 2017; Goh *et al.*, 2016; Rego & Wilson, 2012, etc.). The analyses present divergent views on the relationship between tax avoidance and firm risk. Studies by Guedrib and Bougacha (2024), Cao *et al.* (2021) focusing on Chinese firms, and Goh *et al.* (2016) suggest that tax avoidance can have a negative impact on firm risk. Investors often seek lower anticipated returns due to the positive cash flow effects of corporate tax avoidance. Conversely, Krapl *et al.* (2020) and Rego and Wilson (2012) suggest that tax avoidance could raise firm risk. This is because it alters investors' perceptions about future cash flows. Additionally, Cao *et al.* (2021) and Guenther *et al.* (2017) found in their research on US firms that tax avoidance does not influence firm risk. Both studies align in suggesting that utilizing tax avoidance strategies may not necessarily increase corporate risk.

The variability in results suggests that outcomes may be influenced by specific firm characteristics. Indeed, Hutchens *et al.* (2023) examined the link between tax avoidance and firm risk among Compustat firms from 1991 to 2016 using latent class mixture models. They identified distinct subsets of firms with differing relationships between tax avoidance and firm risk. Their findings revealed that 35.6% of firms had a positive correlation between tax avoidance and priced risk, while 58% showed a similar positive association with idiosyncratic risk. Moreover, they observed significant variations in firm characteristics between these subsets, noting that firms with a positive correlation between tax avoidance and idiosyncratic risk tended to be more profitable compared to those with a negative association.

There has been limited exploration into how firm performance directly affects firm risk outside of corporate governance discussions (Chang *et al.*, 2015). This research gap emphasizes the significance of studying how firm performance influences the link between tax avoidance and firm risk, providing insights from two different angles.

From one perspective, high-performance firms often display greater accountability in their tax strategies and proficiency in managing tax risks, as evidenced by research (Watson, 2015; Lin *et al.*, 2019). Studies indicate that more profitable firms tend to adopt less aggressive tax approaches (Steijvers & Niskanen, 2014; Burman *et al.*, 2023). Additionally, robust corporate governance structures are associated with improved performance and reduced risk (Chang *et al.*, 2015). From a stakeholder theory perspective, it can be inferred that profitable firms are inclined towards

employing less risky or uncertain tax avoidance methods. This tendency may contribute to a reduction in stock return volatility, while the opposite scenario might lead to increased volatility.

On the contrary, Frank *et al.* (2009) argue that companies employing more aggressive tax strategies often exhibit higher levels of profitability. This viewpoint aligns with agency theory, suggesting that firms may adopt riskier tax avoidance approaches due to managerial opportunism and informational benefits (Desai & Dharmapala, 2006). However, the practice of tax avoidance can entail various costs for firms, including implementation, compliance, agency, reputational, and political costs, as highlighted by Desai and Dharmapala (2006), Chen *et al.* (2010), Lanis and Richardson (2011), Hutchens and Rego (2015), Cook *et al.* (2017), Armstrong *et al.* (2015), and Yoon *et al.* (2021). These costs ultimately contribute to an increase in the overall risk associated with the firm's cash flows.

Given the conflicting findings regarding the relationship between tax avoidance and firm risk, as well as the disparate perspectives regarding how firm performance might influence this relationship, it is imperative to explore the moderating effect of firm performance. Therefore, this study offers a substantial contribution to the existing literature by being the first to delve into this moderating role, thereby enhancing our comprehension of the intricate interplay between tax avoidance and firm risk.

To accomplish this goal, we have selected a sample of French firms listed on the CAC40 index and employed various metrics to assess tax avoidance and firm performance. France was chosen due to its status as having the highest tax pressure rate of 46.1% by 2022, a position it had not held since 2018[1]. The study focuses on examining the relationship between tax avoidance and firm risk, considering different measures of tax avoidance and firm performance. Long-term measures of tax avoidance are utilized to scrutinize uncertain tax positions over time, as suggested by Dyreng *et al.* (2008). Two types of firm performance measures are employed: accounting metrics, offering historical insights, and market metrics, providing a forward-looking perspective (Yang *et al.*, 2019). The aim is to investigate whether the impact of tax avoidance on firm risk varies depending on the tax avoidance measure used, and whether both types of performance measures moderate this relationship similarly.

Initial findings indicate that measures of tax avoidance typically do not relate with overall firm risk. It appears that corporate tax avoidance strategies tend to remain stable over time and do not significantly increase firm risk. The study reveals, also, that the choice between accounting-based and market-based performance measures has distinct effects on the relationship between tax avoidance and firm risk. Higher accounting-based performance is associated with reduced firm risk when utilizing tax avoidance strategies, while higher market-based performance is linked to

increased firm risk in this context. Explicitly, firm performance serves as a moderator in the relationship between tax avoidance and firm risk, particularly in the presence of high tax risk. The findings underscore the importance of considering both firm performance and the level of tax risk for informed decision-making regarding tax avoidance practices.

The paper is structured as follows: Section 2 conducts a theoretical review. Section 3 explains the literature review and develops hypotheses. Section 4 elaborates on the research methodology, while Section 5 presents the univariate analysis. Empirical findings are provided in Section 6, followed by a discussion in Section 7. Finally, Section 8 concludes the paper.

2. Theoretical review

Our aim is to thoroughly explain how tax avoidance influences firm risk, and how firm performance moderates this relationship. We will delve into two prominent theories: agency theory and stakeholder theory.

2.1 Agency theory

Agency theory, advanced by Jensen and Meckling in 1976, delves into the dynamics between owners (principals) and managers (agents) in firm management. It highlights how conflicting interests between the two parties can impact various aspects of the firm, including corporate tax strategies. The agent, empowered by the principal, holds decision-making authority in running the company.

In this context, tax avoidance is regarded as a component of the company's tax strategies. Empirical research on tax avoidance, as highlighted by Kim (2011), typically explores two main perspectives. The first suggests that managers pursue tax avoidance primarily to lower corporate tax burdens, potentially benefiting corporate value from investors' standpoint, with managers receiving incentives for their involvement. As stated by Desai and Dharmapala in 2006, "Greater incentive compensation helps align the incentives of agents and principals and leads managers to be more aggressive about increasing firm value through tax avoidance." In contrast, the agency perspective of tax avoidance encompasses broader issues of the conflict between managers and investors, including concerns beyond shirking, such as managerial opportunism like resource diversion. As detailed by Hanlon and Heitzman in 2010, "Tax avoidance is not, in and of itself, a reflection of agency problems. However, separation of ownership and control can lead to corporate tax decisions that reflect the private interests of the manager."

The literature has also initiated an exploration into the effects of tax avoidance on corporate risk, considering the two distinct perspectives above referred to. According to Krapl *et al.* (2020), certain and low-risk tax avoidance strategies can reduce cash

flow volatility, signaling alignment with shareholders' interests and managerial discipline. This alignment and reduced volatility could lead to decreased stock return fluctuations through earnings smoothing associated with tax avoidance strategies. Thus, shareholders might perceive tax avoidance positively, resulting in a decrease in firm risk. Conversely, aggressive tax strategies, such as transfer pricing and tax haven usage, create complexity and opacity in transactions, leading to uncertainty in a firm's future cash flows (Guenther *et al.*, 2017; Wang *et al.*, 2019). Managers obscure tax reduction strategies to avoid political costs, reducing transparency (Guenther *et al.*, 2017). This lack of transparency can result in costs for firms, including those related to tax audits and agency expenses. Additionally, complex tax structures and reduced transparency hinder stakeholders' ability to assess management decisions accurately, increasing uncertainty about future cash flows (Balakrishnan *et al.* (2019); Guenther *et al.* (2017)). This uncertainty can lead to both increased after-tax cash flows and heightened risk for shareholders (Goh *et al.*, 2016).

2.2 Stakeholder theory

From a stakeholder theory perspective, the company must consider the expectations of all stakeholders, not just shareholders (Freeman, 1984). This theory posits that stakeholders' expectations influence a company's strategic decisions regarding taxation, such as engaging in tax avoidance strategies.

In their study of the literature, Kovermann & Velte (2019) extensively examined how corporate governance influences corporate tax avoidance, focusing on a stakeholder-oriented viewpoint. They found that various aspects of corporate governance, such as aligning incentives, board composition, ownership structure, market monitoring, audits, enforcement, and government relations, as well as stakeholder pressures, significantly impact tax avoidance. Unlike traditional principal-agent theory, their research indicates the importance of a holistic approach that considers corporate governance institutions and all stakeholders in understanding tax avoidance factors. They suggest that effective governance mechanisms can encourage more efficient and less risky tax strategies, thereby boosting profitability while minimizing risks.

Moreover, Lin et al (2019) suggest that when companies perform well financially and have the resources to engage in socially responsible activities, their Corporate Social Responsibility (CSR) efforts may reduce their tax risk. Conversely, for companies that perform poorly financially and lack economic resources, engaging in CSR activities may not be consistent with their ethical goals. Instead, these activities may simply mask the negative impact of their financial difficulties. Furthermore, Mathew *et al.* (2020) found in their study of UK FTSE 350 companies that a governance index, derived from board composition, leadership structure, member

attributes, and processes, associates inversely with firm risk. They recommend stakeholders can utilize this index as a tool to assess the degree of risk exposure within firms based on the governance structure. Their research revealed also that there is an inverse relationship between a firm's past performance and its level of risk, suggesting that when a firm's previous performance is weak, managers tend to adopt a more risk-taking approach in the current period.

3. Literature review and hypothesis development

3.1 The impact of tax avoidance on firm risk

Hutchens *et al.* (2023) define firm risk as uncertainty regarding future firm outcomes. They reference Miller (1977), who suggests that uncertainty, divergence of opinion, and risk are closely intertwined. Miller further elaborates that uncertainty often leads to differing opinions, resulting in greater variability in stock prices. Our definition of firm risk aligns with that of Hutchens *et al.* (2023), as we utilize a measure that encompasses overall corporate risk.

On tax avoidance, there is no consensus on the precise definition of this term. Rego (2003) defines tax avoidance as the legitimate use of tax-planning strategies by taxpayers to reduce their income tax liabilities, while expressly excluding any illegal activities related to this reduction. In the same context, Kirchler *et al.* (2003) point out that "tax avoidance refers to an attempt to reduce tax payments by legal means, for instance by exploiting tax-loopholes". Hanlon and Heitzman (2010) define tax avoidance, generally, as "the reduction of explicit taxes". Since we have used long-term tax avoidance as a measure of tax avoidance in this study, we follow the definition of Dyreng *et al.* (2008) "tax avoidance reduces the firm's cash tax rate over a long time period… our measure will reflect reductions that are squarely in compliance with the law as well as those that gray-area interpretations."

Studies examining the relationship between tax avoidance and firm risk have produced conflicting results. On one side, in a study by Cao *et al.* (2021) focusing on China, the analysis of the interplay between tax avoidance and firm risk revealed a positive relationship between firm risk and both Effective Tax Rate (ETR) and Cash Effective Tax Rate (Cash ETR). Utilizing Compustat data from 1993 to 2010, Goh *et al.* (2016) consistently found similar results when using alternative measures for corporate risk and tax avoidance. Their study unveiled that firms involved in tax avoidance, evaluated through metrics like book-tax differences, permanent book-tax differences, and long-run cash effective tax rate, tended to demonstrate lower costs of equity. This suggests that equity investors often aim for a diminished expected rate of return, driven by the favorable cash flow implications associated with corporate tax avoidance.

Other studies failed to yield significant findings on the relationship between tax avoidance and firm risk. Guenther *et al.* (2017) analyzed a sample of US firms spanning from 1987 to 2010 and concluded that tax avoidance measures generally do not predict future overall firm risk. They argued that corporate tax avoidance strategies are persistent but do not elevate firm risk. Similarly, Cao *et al.* (2021) conducted a re-examination focusing on US firms during the same period and found that only the 5-year cash Effective Tax Rate (ETR) exhibited a negative association with firm risk, suggesting that tax avoidance could heighten risk. However, the results regarding alternative tax avoidance measures were inconclusive. Nevertheless, both studies aligned in their conclusion that utilizing tax avoidance strategies does not necessarily increase firm risk.

On the other side, tax avoidance can increase the firm risk. Rego and Wilson (2012) provide evidence that cash ETR is negatively associated with stock return volatility in the American context. Hutchens *et al.* (2023) utilized Ordinary Least Squares (OLS) regression and a latent class mixture model to analyze the relationship between tax avoidance and both priced risk and idiosyncratic risk. They based their analysis on data obtained from Compustat firms spanning the period from 1991 to 2016. Initially, using OLS, they found a negative correlation between tax avoidance and both types of risk. However, the latent class mixture model revealed a more complex picture. It showed that this association varied substantially across different subsets of the sample, with a notable proportion exhibiting a positive relationship between tax avoidance and risk.

In a similar context, Krapl *et al.* (2020) investigated the impacts of tax avoidance and tax risk on stock return volatilities. Their findings suggest that either companies exhibiting extreme levels of tax avoidance (as measured by the long-run effective tax rate and a book-tax difference measure) or high levels of tax risk experience heightened volatility in their stock returns. Notably, they observed that tax avoidance predominantly influences stock return volatility by altering investors' expectations regarding cash flows. Other study has demonstrated that tax avoidance can indeed have a positive impact on corporate risk, particularly when moderated by tax risk. In a recent investigation conducted by Guedrib and Bougacha (2024), they identified a detrimental impact of tax avoidance on firm risk among non-financial French firms. However, the firm risk amplifies when tax avoidance coincides with elevated tax risk levels. Sikes & Verrecchia (2016) reported mixed findings within their study. They observed that while aggregate tax avoidance measured by aggregate cash effective tax rate positively influences the cost of capital, tax avoidance measured by long-run cash effective tax rate has a negative impact. These results indicate that the cost of capital for firms engaging in tax avoidance may fluctuate based on whether numerous other firms are also avoiding taxes. While Krapl *et al.* (2020) suggest that aggressive and complex tax avoidance strategies may elevate return volatilities, less aggressive tax avoidance activities could potentially decrease volatility.

Acknowledging the absence of consensus regarding the impact or direction of tax avoidance on corporate risk, our first hypothesis can be stated as follows:

H1. *Tax avoidance is associated with firm risk*

3.2 The moderating effect of firm performance on the association between tax avoidance and firm risk

Our second objective is to explore whether firm performance moderates the impact of tax avoidance on firm risk. Firm performance can be understood as "the total value created by the firm through its activities, which is the sum of the utility created for each of a firm's legitimate stakeholders" (Harrison & Wicks, 2013). Prior studies have examined the correlation between tax avoidance and corporate risk but haven't fully explored the direct influence of firm performance on this association. There's a gap in understanding how corporate performance affects the relationship between tax avoidance and corporate risk. Analyzing this interaction may unveil two distinct perspectives.

From *a stakeholder theory* perspective, tax avoidance by high-performance firms might negatively influence firm risk. Several studies indicate that high-performance firms tend to demonstrate enhanced accountability in their tax strategies and display proficiency in managing risks effectively. Examining the tax aggressiveness of Finnish firms, Burman *et al.* (2023); Steijvers and Niskanen (2014) control for the firm's profitability by incorporating the return on assets. They found that firms with a higher profitability tend to have higher effective tax rates (ETR). Therefore, firms that are more profitable are less tax aggressive. Watson (2015) identifies a significant link between CSR and tax avoidance in a diverse array of U.S. companies, with this connection being influenced by their financial performance. The research demonstrates that firms lacking in social responsibility are more inclined to engage in tax avoidance, particularly when facing lower current or future earnings. Conversely, this inclination decreases when companies experience stronger financial performance. Consequently, the study suggests that limited resources could impede firms from integrating their CSR principles into tax planning, leading to a reduced emphasis on non-shareholder concerns. Lin *et al.* (2019) strengthen this assertion by examining the moderating influence of firm performance on the correlation between CSR and tax risk. They find that high-performance firms tend to uphold ethical standards and face lower tax risks. Moreover, they note that robust financial performance and ample resources empower firms to engage in CSR initiatives, consequently aiding in the reduction of tax risks. Chang *et al.* (2015) investigated the impact of corporate governance on the connection between firm performance and risk in Taiwan, utilizing data collected from 2008 to 2012. Their study suggests that in times of financial crises, corporate governance serves as a negative moderator, reducing the link between firm performance and risk, thus offering protection to companies.[2] Additionally, their empirical results indicate that Taiwanese listed firms with strong corporate governance structures typically exhibit better performance while also maintaining lower levels of risk. It can be predicted that firms experiencing low performance are inclined to engage in riskier tax avoidance

practices and may compromise on ethical behavior. These risky tax avoidance strategies could contribute to an increase in overall firm risk. Conversely, profitable firms are more likely to adopt tax avoidance strategies that are less risky or uncertain, leading to a reduction in stock return volatility.

On the contrary, tax avoidance strategies among high-performing firms may heighten the risk level of the firm. According to *the agency theory*, the combination of managerial opportunism and informational advantages could drive such firms to adopt riskier tax avoidance approaches, as suggested by Desai and Dharmapala (2006). However, these practices may undermine the firm's stability and long-term viability. Additionally, they may entail various costs for the firms, including implementation, compliance, agency, reputational, and political costs, as noted by Chen *et al.* (2010), Lanis and Richardson (2011), Hutchens and Rego (2015), Cook *et al.* (2017), Armstrong *et al.* (2015), and Yoon *et al.* (2021). Ultimately, these expenses could contribute to an increase in the overall risk associated with the firm's cash flows. In their 2009 study, Frank *et al.* examined how aggressive tax practices relate to financial reporting among US firms. They incorporated return on assets (ROA) as a control variable to address the potential influence of firm profitability as concerns tax planning incentives. Their analysis revealed a significant and positive correlation between measures of tax reporting aggressiveness - specifically discretionary permanent differences and book-tax differences- and ROA. This suggests that firms employing more aggressive tax strategies tend to demonstrate higher levels of profitability. Building on this alternative viewpoint, subsequent studies have corroborated that profitable firms exhibit a greater inclination towards adopting aggressive tax strategies compared to less profitable counterparts (Lanis & Richardson, 2011; Amri *et al.*, 2023). Given that firms that are more profitable have the capacity to engage in more aggressive tax practices, such strategies may entail various costs for these firms, thereby heightening the associated risks with their cash flows.

In the same vein, Hutchens *et al.* (2023) employed a latent class mixture model to investigate the association between tax avoidance and both priced risk and idiosyncratic risk. Their analysis revealed a substantial subset within the sample where tax avoidance exhibited a significant positive correlation with priced risk, contradicting the overall negative trend. Specifically, while 64.4 percent of the sample demonstrated a negative link between tax avoidance and priced risk, 35.6 percent showed a notable positive association. Similarly, concerning idiosyncratic risk, the latent class mixture model identified a significant positive relationship between tax avoidance and idiosyncratic risk for 58 percent of the sample. In contrast, the remaining 42 percent displayed either a negative association or an insignificant relationship. Additionally, they noticed notable differences in the traits of companies within these groups. They found that firms showing a positive link between tax avoidance and idiosyncratic risk tended to be more profitable than those with a negative connection.

The second hypothesis proposes to investigate how the firm performance moderates the relationship between tax avoidance and firm risk, addressing a gap in understanding. Specifically, this study endeavors to fill this gap by examining this moderating effect for the first time.

H2. Firm performance moderates the relationship between tax avoidance and firm risk

4. Research methodology

4.1 Sample selection and data collection

Our research examines how firm performance moderates the relationship between tax avoidance and firm risk among companies listed on the French CAC40 index from 2010 to 2022. By 2022, France had regained its leading position with the highest tax pressure rate of 46.1%, a status it had not held since 2018[3]. The data were sourced from the DATASTREAM database. Information for the year 2008 was gathered because the variables related to tax avoidance (LR_CASH_ETR and LR_ETR) require observations from two years prior (year t-2). We excluded firms in the financial sector due to their distinct characteristics and exposure to a different set of accounting and tax regulations compared to other companies. Therefore, the ultimate sample comprises 36 companies, while the initial sample encompasses 540 firm-year observations. We subsequently eliminated observations exhibiting negative Effective Tax Rates (ETRs) and cash Effective Tax Rates, as well as those with ETRs and cash ETRs exceeding one. Following this step, we refined our dataset to 301 observations, having excluded instances with missing data.

Table 1, Panel A, illustrates the sample selection process, culminating in 301 firm-year observations included in the final sample. Panels B and C of Table 1 display the distribution of the sample across years and industries, respectively. The sample primarily comprises companies from the industrial sector (25.58%) and the Consumer Discretionary sector (27.57%), with a balanced distribution across different years.

Table 1. Summary of the sample selection procedure and sample characteristics

PANEL A: Sample selection procedure	
French listed firms in the CAC 40 index, excluding firms operating in financial sectors	36
Initial number of firm-year observations	540
Excluding firm-year observations with:	
✓ Negative ETR and/or cash ETR	50
✓ ETRs and cash ETR exceeding 1	7
✓ Missing data to compute tax avoidance	114
✓ Missing data to compute other variables	68
Final number of firm-year observations	301
PANEL B: Distribution of firm-year observations by year	

Year	Number of obs.	Percentage
2010	24	7,97%
2011	23	7,64%
2012	25	8,31%
2013	24	7,97%
2014	24	7,97%
2015	23	7,64%
2016	23	7,64%
2017	23	7,64%
2018	26	8,64%
2019	24	7,97%
2020	21	6,98%
2021	24	7,97%
2022	17	5,65%
TOTAL	**301**	**100.00**

PANEL C: Distribution of firm-year observations by industry

Industry type (ICB classification)	Number of obs.	Percentage
Technology	32	10,63%
Telecommunications	11	3,65%
Health care	37	12,29%
Real Estate	7	2,33%
Consumer Discretionary[4]	83	27,57%
Consumer Staples[5]	27	8,97%
Industrials	77	25,58%
Basic Materials	13	4,32%
Energy	11	3,65%
Utilities	3	1,00%
TOTAL	301	100.00

Note: ICB = Industry classification benchmark

4.2 Variables measurement

4.2.1 Firm risk

To test our research hypotheses empirically, we adopted return volatility (Vol_Return) as a proxy for firm risk which represents the total risk. Return volatility represents the standard deviation of monthly stock returns for the given year and has been widely employed in various empirical studies (Hutchens & Rego, 2015; Guenther et al., 2017; Guedrib & Bougacha, 2024).

4.2.2 Corporate tax avoidance

As a measure of tax avoidance, we use the LR_CASH_ETR "Long run Cash Effective Tax Rate". LR_CASH_ETR is calculated as the sum of cash taxes paid over three years scaled by the sum of pre-tax income over the same period. Precisely, to obtain this measurement, we have divided the sum of cash taxes paid for firm i

measured over the period t-2 to t by the sum of pre-tax income also for firm i over the period t-2 to t. Given that a higher LR_CASH_ETR implies lower tax avoidance, we adjust this measure by multiplying it by -1.

Dyreng *et al.* (2008) discovered that annual cash-effective tax rates display asymmetrical year-to-year persistence, with low rates exhibiting greater sustainability over time compared to high rates. This suggests that firms may employ management strategies or possess inherent characteristics that enable them to consistently minimize tax liabilities over extended periods. Our study aligns with Dyreng *et al.*'s findings by examining tax avoidance through long-term cash-effective tax rates over three years, avoiding distortions from tax accrual effects and mitigating the impact of short-term fluctuations. This approach offers a more accurate assessment of a company's sustained tax burden, contributing to a deeper understanding of tax avoidance strategies and their implications on firm risk.

4.2.3 Firm Performance

Evaluating firm performance involves considering two main viewpoints: accounting metrics, grounded in audited accounting principles, and market-based metrics influenced by investor sentiment, behavior, and analysts' predictions. While accounting metrics offer retrospective insights, market-based metrics offer a forward-looking outlook, reflecting the dynamic interaction of market forces and investor expectations (Yang *et al.*, 2019).

To gauge firm performance represented as "FPER," we incorporate both accounting-based and market-based metrics, specifically ROA and MTB, respectively. ROA is the return on assets used as the accounting-based measure of a firm. It is measured as the earnings before interest and taxes (EBIT) scaled by total assets (Hutchens & Rego, 2015). The Market-to-book (MTB) is calculated, as market capitalization scaled by book value of equity (Yang *et al.*, 2019).

4.2.4 Control variables

The empirical models introduced in the study incorporate various control variables to enhance the reliability of the analysis regarding firm risk (Guenther *et al.* 2017; Cao *et al.* 2021; Guedrib & Bougacha, 2024). These variables include firm size (SIZE), leverage (LEV), common shares outstanding (CSHO), pre-tax book income volatility (SD_PTBI) and cash flow volatility (SD_OCF).

Firstly, SIZE is represented by the natural logarithm of total assets. Smaller firms are believed to exhibit greater return volatility and higher overall risk compared to larger firms. Hence, SIZE is expected to have a negative association with firm risk. Second, LEV is measured as the ratio of long-term debt to total assets. Leveraged firms are deemed more susceptible to financial distress, with higher debt-to-equity ratios resulting in increased debt burden and stock return volatility. Third, we

included the common shares outstanding (CSHO) measured by the log of the firm's common shares outstanding. Furthermore, our analysis incorporates measures of pre-tax book income volatility (SD_PTBI) and cash flow volatility (SD_OCF) to illustrate the inherent riskiness of the firm's operations. SD_PTBI is determined as the standard deviation of annual pretax book income scaled by total assets measured over a three-year period. SD_OCF represents the standard deviation of operating cash flow scaled by total assets, also measured across a three-year period. These additions enrich our understanding of the firm's operational risk profile, providing valuable insights into its financial stability and performance dynamics. Finally, we control for year and industry-fixed effects (two-digit SIC dummies are included in the research models). All variables are defined in Table 2.

Table 2. Variables definition

Variables	Abbreviations	Description of measures	Authors
Dependent variable			
Firm risk	**FIRMRISK**	Return Volatility (Vol_Return): the standard deviation of monthly stock returns for actual year	Hutchens & Rego (2015) Guenther *et al.* (2017)
Independent variables			
Tax Avoidance	**TAXAVOID1 = - LR_CASH_ETR**	Long run Cash Effective Tax Rate = Sum of cash taxes paid for firm i measured over the period t-2 to t / Sum of pre-tax income for firm i over the period t-2 to t.	Dyreng *et al.* (2008)
	TAXAVOID2 = - LR_ETR	Long run Effective Tax Rate = Sum of income tax expense for firm i measured over the period t-2 to t / Sum of pre-tax income for firm i over the period t-2 to t.	
Firm performance	**Accounting-based measures**		Hutchens & Rego (2015) Guenther *et al.* (2017) Yang *et al.*, (2019) Kramer & Peters, (2001)
	ROA	Return on assets Earnings before interest and taxes (EBIT) scaled by total assets	
	OCF	the operating cash flow scaled by total assets	
	Market-based measures		
	MTB	Market-to-book: market capitalization scaled by book value of equity.	

(FPER)

Variables	Abbreviations	Description of measures	Authors
	MVA	Market Value Added in percent: market capitalization less book value of equity scaled all by book value of equity	
Control variables			
Firm Size	**SIZE**	Natural log of total assets	Hutchens &
Leverage	**LEV**	Long term debt scaled by total assets	Rego (2015) Guenther *et al.*
Common shares outstanding	**CSHO**	The log of the firm's common shares outstanding	(2017) Cao *et al.* (2021)
Pre-tax book income Volatility	**SD_PTBI**	Standard deviation of annual pretax book income scaled by total assets measured over a three-year period.	
Cash-flow Volatility	**SD_OCF**	Standard deviation of operating cash flow scaled by total assets measured over a three-year period.	

4.3 Models' specification

To test empirically the relation between tax avoidance and firm risk as specified in our first hypothesis, we use the following regression model:

Model 1

$$FIRMRISK_{i,t} = \alpha_0 + \alpha_1 \ TAXAVOID_{i,t} + \alpha_2 \ FSIZE_{i,t} + \alpha_3 \ LEV_{i,t} + \alpha_4 \ CSHO_{i,t} + \alpha_4 \ SD\_PTBI_{i,t} + \alpha_5 \ SD\_OCF_{i,t} + \varepsilon_{i,t}$$

The primary coefficient of focus in the model is denoted as α_1, representing the impact of tax avoidance on firm risk.

To explore the moderating impact of firm performance, we introduce an interaction term between firm performance and tax avoidance, thus extending our model to include this interaction effect. The model can be expressed as follows:

Model 2

$$FIRMRISK_{i,t} = \beta_0 + \beta_1 \ TAXAVOID_{i,t} + \beta_2 \ FPER_{i,t} + \beta_3 \ FPER_{i,t} \times TAXAVOID_{i,t} + \beta_4 \ FSIZE_{i,t} + \beta_5 \ LEV_{i,t} + \beta_6 \ CSHO_{i,t} + \beta_7 \ SD\_PTBI_{i,t} + \beta_8 \ SD\_OCF_{i,t} + \varepsilon_{i,t}$$

The key coefficient of interest in the model is β_3, which reflects the moderating influence of firm performance on the association between tax avoidance and firm risk. The hypothesis does not specify a directional relationship for this variable.

Therefore, the coefficient β_3 could demonstrate significance in either a positive or a negative direction, or it could be statistically insignificant altogether.

ε is the error term and the indices i and t represent, respectively, the firm and the year.

5. Univariate analysis

5.1 Descriptive statistics

Table 3 provides descriptive statistics for both the dependent and independent variables utilized in the regressions. The mean value of our dependent variable, FIRMRISK, stands at 6.4%, with a range spanning from 2.7% to 19%. This figure is notably lower than the average identified by Guenther *et al.* (2017) in a sample of U.S. firms, which was reported as 13.4%.

For tax avoidance proxies, Table 3 reports that means (medians) for the LR_CASH_ETR (LR_ETR) are, respectively, about 26.2 % (27%) and 27.6% (28%). We notice that the means of the measures of tax avoidance are very close and similar to the annual Cash ETR (ETR) found by Guedrib & Bougacha (2024) in the same context.

Table 3 summarizes key firm performance indicators, with an average Return on Assets (ROA) of 8.2%, signifying solid profitability relative to their asset base. Additionally, the average Market-to-Book (MTB) ratio of 2.98 suggests robust performance within the CAC 40 firms. This indicates investors' positive sentiment towards these firms' performance and their anticipated growth potential.

Table 3. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Median	Max
Vol_Return	0.064	0.024	0.027	0.06	0.19
LR_CASH_ETR	0.262	0.115	0.009	0.27	0.711
LR_ETR	0.276	0.076	0.058	0.28	0.575
ROA	0.082	0.05	0.007	0.07	0.345
MTB	2.98	2.234	0.355	2.26	13.861
FSIZE	17.096	1.108	13.942	17.21	19.351
LEV	0.195	0.118	0.001	0.18	0.572
CSHO	5.606	0.411	4.743	5.67	6.425
SD_PTBI	0.014	0.012	0.0003	0.01	0.072
SD_OCF	0.013	0.01	0.0002	0.01	0.053

Note. This table reports the descriptive statistics for the study variables using 301 firm-year observations from 2010 to 2022. All variables are defined in Table 2.

5.2 Correlation analysis

To assess multicollinearity, we conducted the Pearson correlation matrix and the VIF test, as presented in Table 4. According to Hair *et al.* (2006), multicollinearity becomes a concern when correlation coefficients exceed 0.7. In our analysis, we observed that all correlation coefficients are below this threshold. Furthermore, VIF values range from 1.18 to 2.14, well below the commonly accepted threshold of 10, indicating the absence of multicollinearity issues.

The results presented in the same table indicate an insignificant negative correlation between both LR_CASH_ETR and LR_ETR and firm risk (Vol_Return). This result aligns with our expectations, allowing us to confirm our basic hypothesis a priori. Moreover, the table displays a significant negative correlation between the measure of firm performance (ROA) and firm risk (-0.140, $p < 0.05$), while an insignificant negative correlation is observed between MTB and firm risk (-0.006). Thus, these preliminary findings confirm that higher ROA (as an accounting measure) is associated with decreased corporate risk.

Table 4. The correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	VIF
(1) Vol_Return	1.000										
(2) LR_CASH_ETR	-0.005	1.000									1.37
(3) LR_ETR	-0.003	0.489***	1.000								1.52
(4) ROA	-0.140**	0.041	0.168***	1.000							1.86
(5) MTB	-0.006	-0.087	-0.017	0.542***	1.000						1.65
(6) FSIZE	-0.057	0.144**	0.098*	-0.405***	-0.433***	1.000					2.14
(7) LEV	-0.074	-0.135**	-0.049	-0.252***	0.053	0.102*	1.000				1.18
(8) CSHO	-0.108*	0.205***	0.293***	-0.223***	-0.257***	0.652***	0.028	1.000			1.95
(9) SD_PTBI	0.302***	0.045	-0.013	0.273***	0.163***	-0.038	-0.119**	0.034	1.000		1.32
(10) SD_OCF	0.239***	0.090	0.035	0.125**	0.098*	-0.135**	-0.149***	-0.098*	0.402***	1.000	1.25

Note. This table reports the Pearson's correlation coefficients and VIFs of variables for the study variables using 301 firm-year observations from 2010 to 2022. All variables are defined in Table 2. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

6. Regression results

6.1 Regression of baseline results

Table 5 presents the FGLS estimates for our regression models. It indicates that the "Wald Chi2" test for the overall significance of each model is significant at the 1%

level (Prob>Chi2 = 0.000), suggesting that our estimated models have substantial explanatory capabilities. Column 1 displays the results for model 1, while columns 2 and 3 present the results for model 2.

6.1.1 Tax avoidance and firm risk

The research hypothesis tests the impact of tax avoidance on company risk (Vol_Return). Column (1) provide the estimation of the model 1. It indicates that tax avoidance (TAXAVOID1 = - LR_CASH_ETR) is not significantly associated with firm risk. This result does not confirm our first hypothesis and corroborates the one found by Cao *et al.* (2021) and Guenther *et al.* (2017) in the U.S. context. Guenther *et al.* (2017) have stated that measures of tax avoidance are generally not associated with future overall firm risk and they have proved that corporate tax avoidance is accomplished using strategies that are persistent and do not increase firm risk.

6.1.2 The moderating effect of firm performance on the link between tax avoidance and firm risk

The second hypothesis examines the moderating effect of firm performance on the relationship between tax avoidance and company risk (Vol_Return). The variable of interest is the interaction of tax avoidance measure (TAXAVOID1 = - LR_CASH_ETR) and each measure of firm performance "FPERF (ROA or MTB).

Table 5, Column 2 shows the results of Model 2 investigating the moderating effect of firm performance (ROA) on the relationship between TAXAVOID1 and Vol_Return. The outcomes indicate that ROA moderates negatively the relationship between tax avoidance and firm risk (ß = - 0.505, z-stat =0.205, $p < 0.05$). Thus, for companies with higher ROA (accounting measure), tax avoidance significantly decreases corporate risk.

Table 5 column 3, reports the results of regression model estimation for the moderating effect of firm performance (MTB), on the relationship between TAXAVOID1 and Vol_Return. The outcomes indicate that MTB moderates positively the relationship between tax avoidance and firm risk (ß = 0.0122, z-stat =0.00504, $p < 0.05$). So, for firms with higher market-to-book ratios (a market measure), tax avoidance is found to have a positive and significant effect on firm risk.

The findings indicate that the choice of firm performance metric, whether Return on Assets (ROA) or Market-to-Book ratio (MTB), influences how tax avoidance affects firm risk. Specifically, higher levels of tax avoidance are linked to a decrease in firm risk when using accounting-based performance measures like ROA. Conversely, when market-based performance measures such as MTB are considered, increased tax avoidance tends to be associated with heightened firm risk. This underscores the

nuanced relationship between tax avoidance, firm performance metrics, and overall firm risk.

Combining financial performance (ROA) with tax avoidance supports stakeholder theory by promoting prudent financial management and reducing perceived risk, as it considers the interests of all stakeholders. Investors may have greater confidence in estimating the future cash flows of firms with high accounting performance, as these firms are typically viewed as more socially responsible. Furthermore, the perception that tax avoidance strategies carry minimal risk adds to the predictability of future cash flows for such firms. Conversely, combining stock performance (MTB) with tax avoidance aligns with agency theory, emphasizing shareholder wealth maximization. Nevertheless, it may heighten perceived risk due to potential short-termism and conflicts of interest. This association could lead to high growth expectations and increased investor tolerance toward aggressive tax practices, further elevating perceived risk. Unlike traditional accounting performance metrics, market-based performance measures can signal to investors the potential adoption of aggressive tax strategies, complicating future cash flow estimation. These findings highlight the divergent effects of tax avoidance across various performance metrics, providing insights into its implications for shareholder interests.

Table 5. Baseline results

VARIABLES	*Model 1*	*Model 2*	
		FPERF (ROA)	**FPERF (MTB)**
TAXAVOID1	0.011	0.048***	-0.026
	(0.010)	(0.017)	(0.018)
ROA		-0.240***	
		(0.069)	
TAXAVOID1ROA		*-0.505** *	
		(0.205)	
MTB			0.002*
			(0.001)
TAXAVOID1MTB			*0.012** *
			(0.005)
FSIZE	0.004***	0.002	0.003**
	(0.001)	(0.001)	(0.001)
LEV	0.012	0.008	0.007
	(0.010)	(0.010)	(0.010)
CSHO	-0.013***	-0.011***	-0.015***
	(0.003)	(0.004)	(0.003)
SD_PTBI	0.301***	0.379***	0.316***
	(0.080)	(0.080)	(0.085)
SD_OCF	0.210**	0.142	0.204**
	(0.097)	(0.100)	(0.099)
Constant	0.088***	0.129***	0.101***
	(0.023)	(0.025)	(0.024)

VARIABLES	Model 1	Model 2	
		FPERF (ROA)	**FPERF (MTB)**
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	301	301	301
Adj R-squared	41.33%	44.44%	42.48%
Wald chi2(30)	417.45	461.36	426.24
Prob > chi2	0.000	0.000	0.000

Note. This table reports the baseline results for the two study models. The sample selection process is described in Table 1 and all variables are defined in Table 2. Coefficient estimates are presented with the z-statistics reported in parentheses. All models include year and industry fixed effects. ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.

6.2 Robustness tests

6.2.1 Results of the modification of tax avoidance measure

To bolster our primary findings, the initial robustness test involves altering the tax avoidance measure to ensure the consistency of our results. We employ TAXAVOID2 (- LR_ETR) as an alternative measure. LR_ETR is computed by dividing the sum of income tax expense over three years by the sum pre-tax income over the same period.

Table 6 shows that results remain the same even after changing the measure of tax avoidance. Tax avoidance does not affect firm risk. Nevertheless, TAXAVOID2*ROA (TAXAVOID2*MTB) has a significant positive (negative) influence on corporate risk. Therefore, according to hypothesis 2, firm performance moderates the relationship between tax avoidance and firm risk differently depending on the measure used.

Table 6. The modification of tax avoidance measure

VARIABLES	Model 1	Model 2	
		FPERF (ROA)	**FPERF (MTB)**
TAXAVOID2	0.0210	0.0735***	-0.0193
	(0.0170)	(0.0264)	(0.0249)
ROA		-0.318***	
		(0.0829)	
TAXAVOID2ROA		*-0.778***	
		(0.255)	
MTB			0.00334
			(0.00228)
TAXAVOID2MTB			*0.0137*
			(0.00788)

VARIABLES	Model 1	Model 2	
		FPERF (ROA)	FPERF (MTB)
FSIZE	0.00401***	0.00214	0.00384***
	(0.00143)	(0.00157)	(0.00143)
LEV	0.0117	0.00792	0.00732
	(0.0105)	(0.0107)	(0.0109)
CSHO	-0.0145***	-0.0135***	-0.0148***
	(0.00410)	(0.00419)	(0.00377)
SD_PTBI	0.300***	0.411***	0.299***
	(0.0830)	(0.0821)	(0.0852)
SD_OCF	0.184*	0.0654	0.202**
	(0.100)	(0.102)	(0.100)
Constant	0.0997***	0.151***	0.0953***
	(0.0263)	(0.0283)	(0.0262)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	301	301	301
Adj R-squared	41.52%	44.69%	42.06%
Wald chi2(30)	408.63	474.48	421.53
Prob > chi2	0.0000	0.0000	0.0000

Note. This table reports the robustness test of the models 1 and 2, successively after the modification of tax avoidance measure (-LR_ETR "TAXAVOID2" instead of –LR_CashETR "TAXAVOID1") The sample selection process is described in Table 1 and all variables are defined in Table 2. Coefficient estimates are presented with the z-statistics reported in parentheses. All models include year and industry fixed effects. ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.

6.2.2 Results of the modification of firm performance measures

In the second step, we change the measures of firm performance, both accounting and market metrics namely, OCF and MVA respectively. OCF "Operating Cash Flow" is measured as the operating cash flow scaled by total assets (Guenther *et al.*, 2017). MVA "Market Value Added" in percent is measured as market capitalization less book value of equity scaled all by book value of equity (Kramer & Peters, 2001). Table 7 reports the results of regression model estimation for the moderating effect of OCF (columns 1 and 2) and MVA (columns 3 and 4), respectively on the relationship between the different measures of tax avoidance (TAXAVOID1 and TAXAVOID2) and firm risk.

The results displayed in Table 7, specifically in columns 1 and 2, demonstrate the moderating influence of accounting performance (OCF). They reaffirm the negative association between tax avoidance and company risk across both measures of tax avoidance (TAXAVOID1 and TAXAVOID2). Furthermore, Table 7, columns 3 and 4, illustrate the moderating impact of market performance (MVA), revealing a significant and positive relationship with both measures of tax avoidance. These

findings align consistently with our initial results, providing further support for our conclusions.

Table 7. The modification of firm performance measures

VARIABLES	Model 2			
	FPERF (OCF)		FPERF (MVA)	
TAXAVOID1	0.0455**		-0.0116	
	(0.0229)		(0.0149)	
TAXAVOID2		0.0509		-0.00558
		(0.0354)		(0.0197)
OCF	-0.194**	-0.184*		
	(0.0762)	(0.102)		
TAXAVOID1OCF	*-0.407*			
	(0.245)			
TAXAVOID2OCF		*-0.369*		
		(0.134)		
MVA			0.00253*	0.00334
			(0.00150)	(0.00228)
TAXAVOID1MVA			*0.0116**	
			(0.00529)	
TAXAVOID2MVA				*0.0137*
				(0.00788)
FSIZE	0.00205	0.00231	0.00357**	0.00384***
	(0.00172)	(0.00170)	(0.00153)	(0.00143)
LEV	0.00548	0.00322	0.00637	0.00732
	(0.0108)	(0.0105)	(0.0108)	(0.0109)
CSHO	-0.0104**	-0.0120***	-0.0154***	-0.0148***
	(0.00461)	(0.00454)	(0.00427)	(0.00377)
SD_PTBI	0.324***	0.354***	0.304***	0.299***
	(0.0868)	(0.0865)	(0.0881)	(0.0852)
SD_OCF	0.172*	0.149	0.181*	0.202**
	(0.104)	(0.104)	(0.103)	(0.100)
Constant	0.126***	0.132***	0.107***	0.0987***
	(0.0282)	(0.0291)	(0.0265)	(0.0259)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	301	301	301	301
Adj R-squared	43.06%	43.19%	42.48%	42.06%
Wald chi2(30)	438.26	453.86	411.84	421.53
Prob > chi2	0.0000	0.0000	0.0000	0.0000

Note. This table reports the robustness test of the model 2 after the modification of firm performance measures (OCF instead of ROA) and (MVA instead of MTB). The sample selection process is described in Table 1 and all variables are defined in Table 2. Coefficient estimates are presented with the z-statistics reported in parentheses. All models include year and industry fixed effects. ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.

6.3 Additional analysis

Tax-related uncertainties incur substantial costs for firms, surrounding tax planning, compliance endeavors, operational adjustments, and reputational hazards associated with employing aggressive tax strategies (Hutchens & Rego, 2015). Therefore, considering the potential consequences of tax risk, it can heighten a company's overall risk, "the greater the uncertainty surrounding the outcomes of corporate tax decisions, the greater the tax risk and the more likely that measures of firm risk should reflect increased tax uncertainty" (Hutchens & Rego, 2015, p. 11).

Some studies have found evidence that tax risk is positively associated with several measures of firm risk (Hutchens & Rego, 2015; Guenther *et al.*, 2017; Krapl *et al.*, 2020; Guedrib & Bougacha, 2024). Consequently, a risky tax strategy is likely to lead to increased volatility in tax outcomes. In the French context, Guedrib and Bougacha (2024) have found that tax risk plays a moderating role in the relationship between tax avoidance and firm risk. The role of tax risk is crucial in the relationship between tax avoidance and firm risk. Specifically, for firms with high levels of tax risk, tax avoidance has positively affected firm risk.

Therefore, we have chosen to subdivide our sample into two parts. The first comprises firms with a high tax risk, while the second includes firms with a low tax risk. Observations with values above the median of cash Effective Tax Rate (ETR) volatility constitute the sample with the highest tax risk (156 in our sample), while those with values below the median of cash ETR volatility form the sample with the lowest tax risk (145 in our sample), The tax risk metric, Vol_Cash ETR, is calculated as the standard deviation of three-year Cash Effective Tax Rates (ETRs) from period $t - 2$ to t. A higher standard deviation implies a higher level of tax risk.

The results from Column (1) of Table 8-Panel A show a significant positive association between tax avoidance (measured by LR_CASH_ETR) and firm risk. However, Column (2) of the same table indicates that tax avoidance (measured by LR_ETR) is not significantly linked to firm risk. These findings suggest that for observations with a high level of tax risk, the first hypothesis is confirmed. Specifically, tax avoidance measured by long run cash effective tax rate increases overall risk. When tangible tax risks arise, they increase uncertainty and volatility in returns due to the significant impact of cash taxes over time.

The findings indicate that the moderating effect remains evident within the subset of observations characterized by a high level of tax risk (Table 8-Panel A), while it disappears within the subset of observations with a low level of tax risk (Table 8-Panel B). Consequently, firm performance serves as a moderator on the association between tax avoidance and firm risk in the context of heightened tax risk. Moreover, the extent of the moderating effect of firm performance on the relationship between tax avoidance and firm risk varies depending on both the metric of firm performance (whether accounting or market-based) and the level of tax risk.

Table 8. Additional Analysis

Panel A: High Tax Risk

VARIABLES	Model 1		Model 2			
			FPERF (ROA)		FPERF (MTB)	
TAXAVOID1	0.0349***		0.0760***		-0.00186	
	(0.0129)		(0.0189)		(0.0231)	
TAXAVOID2		0.0219		0.0631*		-0.0646*
		(0.0201)		(0.0324)		(0.0350)
ROA			-0.298***	-0.362***		
			(0.0878)	(0.108)		
TAXAVOID1ROA			*-0.326**			
			(0.244)			
TAXAVOID2ROA				*-0.652***		
				(0.330)		
MTB					0.00234	0.00894***
					(0.00164)	(0.00340)
TAXAVOID1MTB					*0.0142***	
					(0.00700)	
TAXAVOID2MTB						*0.0365****
						(0.0128)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0	0	0	0	0.138***	0.0714*
	(0)	(0)	(0)	(0)	(0.0383)	(0.0406)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	156	156	156	156	156	156
Adj R-squared	35%	34.13%	40.31%	38.35%	35.48%	35.54%
Wald chi2(30)	10778.44	4800.73	5656.56	3910.32	302.97	318.96
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note. This table reports the additional results for the two study models for the High Tax risk sample. The sample selection process is described in Table 1 and all variables are defined in Table 2. Coefficient estimates are presented with the z-statistics reported in parentheses. All models include year and industry fixed effects. ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.

Panel B: Low Tax Risk

VARIABLES	Model 1		Model 2			
			FPERF (ROA)		FPERF (MTB)	
TAXAVOID1	-0.0123		0.0294		-0.0299	
	(0.0145)		(0.0290)		(0.0262)	
TAXAVOID2		0.0302		0.0678*		0.0361
		(0.0209)		(0.0396)		(0.0264)
ROA			-0.162	-0.138		
			(0.105)	(0.122)		
TAXAVOID1ROA			-0.470			
			(0.328)			
TAXAVOID2ROA				-0.435		
				(0.385)		
MTB					0.00247	-0.000475
					(0.00241)	(0.00284)
TAXAVOID1MTB					0.00673	
					(0.00825)	
TAXAVOID2MTB						-0.00337
						(0.00961)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.0687***	0.0775***	0.0755***	0.0918***	0.0560*	0.0641**
	(0.0263)	(0.0254)	(0.0277)	(0.0309)	(0.0288)	(0.0280)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	145	145	145	145	145	145
Adj R-squared	48.48%	48.71%	49.38%	48.33%	47.96%	48.42%
Wald chi2(30)	312.82	352.00	320.06	341.26	319.31	384.37
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note. This table reports the additional results for the two study models for the Low Tax risk sample. The sample selection process is described in Table 1 and all variables are defined in Table 2. Coefficient estimates are presented with the z-statistics reported in parentheses. All models include year and industry fixed effects. ***, **, and * denote significant at the 1%, 5%, and 10% levels, respectively.

7. Discussion

The current study has yielded three primary findings. Firstly, our research indicates that there is no correlation between long-run tax avoidance and firm risk. This observation aligns with the conclusions drawn by Cao *et al.* (2021) and Guenther *et al.* (2017) within the U.S. setting. In the same context of this study, Guedrib and Bougacha (2024) identified a negative correlation between tax avoidance and firm risk, employing annual tax avoidance as their measure. This highlights the critical role of selecting the appropriate measure of tax avoidance in determining this relationship. According to Dyreng *et al.* (2008), utilizing a long-term tax avoidance measure can help circumvent distortions arising from tax accrual effects and mitigate the influence of short-term fluctuations. This methodology provides a more precise evaluation of a firm's enduring tax burden, thereby enhancing comprehension of tax avoidance strategies. Moreover, Cao *et al.* (2021) recommended that the inconsistency in findings regarding the association between tax avoidance and firm risk hinges on the specific measure of tax avoidance utilized. Therefore, the choice between annual or long-run tax avoidance appears as a crucial determinant in comprehending the interplay between tax strategies and firm risk.

Secondly, the moderation analysis reveals that the absence of an effect between long-term tax avoidance and return volatility transforms into an effect, manifesting as either negative or positive effect. By investigating the moderating influence of corporate performance, it seeks to refine our understanding of this the nuanced connection between tax avoidance and corporate risk. The findings indicate that the moderating impact of firm performance on the link between tax avoidance and corporate risk depends on the performance metric employed. When using accounting measures like Return on Assets or Operating Cash Flow, the interaction between one of these measures and tax avoidance tends to mitigate corporate risk. However, with market measures such as Market-to-Book Ratio or Market Value Added, tax avoidance in conjunction with these metrics amplifies the company's risk.

This finding can be explained in two different ways. First of all, integrating accounting performance with tax avoidance supports stakeholder theory by promoting prudent risk management and reducing perceived risk. Conversely, combining stock performance with tax avoidance aligns with agency theory, emphasizing shareholder wealth maximization but potentially raising perceived risk due to conflicts of interest. The interaction between tax avoidance and market-based performance may complicate future cash flow estimation, as investors could interpret it as a signal of aggressive tax strategies. These findings highlight the contrasting effects of tax avoidance when paired with different performance measures, illuminating its implications for stakeholder versus shareholder interests and the levels of perceived risk associated with each approach.

Next, accounting-based performance indicators provide a retrospective view, while market-based indicators offer a forward-looking perspective, capturing the dynamic interplay of market forces and investor expectations. Consequently, the interaction of accounting indicators with tax avoidance tends to mitigate risk, as they offer a more stable assessment of past performance. Conversely, market indicators interacting with tax avoidance often heighten risk, as they are influenced by volatile market sentiments and may lead to potential misinterpretation or overestimation of future performance.

As stated in the introduction, the literature provides contrasting perspectives on how tax avoidance influences firm risk, with some arguing for a negative effect, others suggesting a potential positive impact, and yet others suggesting no impact. Therefore, in addition to the measures used and contexts studied, the diversity of results indicates that specific company characteristics, such as performance, could play a significant role in the influence of tax avoidance on corporate risk.

Thirdly, we conducted further analysis by sharing the study sample into two sub-groups: observations with high tax risk and observations with low tax risk. This approach was inspired by the findings of Guedrib and Bougacha (2024), who demonstrated in the French context that tax risk moderates the relationship between tax avoidance and firm risk. In our analysis of observations marked by high tax risk, we identified a positive correlation between long-term cash effective tax rates and corporate risk levels. For French CAC 40 companies, increased tax risk can impose substantial costs, particularly through expenses accrued during tax audits. This undermines shareholders' ability to accurately evaluate management decisions, thereby heightening uncertainty about future cash flows and ultimately raising overall risk. Moreover, the findings suggest that even within observations featuring high tax risk, the moderating effect persists. Thus, firm performance serves as a moderator in the connection between tax avoidance and firm risk. Additionally, the extent of this moderating influence varies, akin in the results of the second hypothesis, contingent upon whether accounting or market metrics are employed to gauge firm performance.

8. Conclusion

Despite extensive research spanning decades on the determinants and consequences of tax avoidance, there are still significant gaps in our understanding of this field. This study adds to the current body of literature by highlighting the moderating role of firm performance on the relationship between tax avoidance and company risk.

From this study, three main findings emerge. Firstly, tax avoidance measured by long-run metrics does not affect firm risk. Therefore, the results regarding the impact of tax avoidance on firm risk depend largely on the measure of tax avoidance used. Secondly, although the moderating effect of firm performance on the relationship

between tax avoidance and firm risk is confirmed, this effect varies depending on the measure of firm performance used. For highly profitable companies, as measured by accounting metrics, tax avoidance tends to lower firm risk, possibly due to their emphasis on social responsibility and robust risk management. However, in these same firms with strong market performance indicators, tax avoidance is associated with heightened firm risk. This disparity in interpretation underscores differing perspectives of investors regarding accounting versus market performance measures. Finally, additional analysis shows that the moderating effect of performance persists only for the subset of observations with a high level of tax risk. Investors perceive that despite the association between tax avoidance practices and high tax risk, companies with strong accounting performance can effectively mitigate this risk and reduce it to an acceptable level. Subsequently, investors can forecast the firm's future tax liabilities and, thus, its future cash flows, thereby diminishing firm risk. Firms with high market-based performance are interpreted as adopting risky tax practices, which makes future cash flows unpredictable for investors and firm risk increases as a result.

Our study has significant implications across theoretical, methodological, and practical domains. Theoretically, it contributes to the tax literature by investigating how firm performance moderates the link between tax avoidance and firm risk, thereby expanding existing knowledge. Methodologically, we employed a measure of tax avoidance focused on the long term, which has been sparingly utilized in empirical studies. We have also identified two distinct performance measures: the accounting and market measures. From a practical standpoint, investors can benefit from considering both firm performance and tax avoidance as interrelated indicators to enhance decision-making processes.

This study's primary limitation is its reliance on a small sample of non-financial French-listed companies (CAC40), limiting the generalizability of findings. Conducting an international analysis would offer a broader understanding of this moderating effect and its variations across countries. Furthermore, the study did not explore various measures of corporate risk, such as the cost of capital.

Future research could investigate how governance mechanisms moderate the relationship studied, using a larger sample and exploring different contexts. Strong governance mechanisms have the potential to alleviate the adverse effects of tax avoidance.

References

Amri, K., Ben Mrad Douagi, F. W., & Guedrib, M. (2023) "The impact of internal and external corporate governance mechanisms on tax aggressiveness: Evidence from Tunisia", *Journal of Accounting in Emerging Economies*, *13*(1): 43-68. https://doi.org/10.1108/JAEE-01-2021-0019

Armstrong, C. S., Blouin, J. L., Jagolinzer, A. D., & Larcker, D. F. (2015) "Corporate governance, incentives, and tax avoidance", *Journal of Accounting and Economics*, *60*(1): 1-17. https://doi.org/10.1016/j.jacceco.2015.02.003

Balakrishnan, K., Blouin, J. L., & Guay, W. R. (2019) "Tax aggressiveness and corporate transparency", *The Accounting Review*, *94*(1): 45-69. https://doi.org/10.2308/accr-52130

Burman, V., Niskanen, M., Mättö, M., & Ojala, H. (2023) "How does corporate governance affect tax aggressiveness? Evidence from Finland", *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4433568

Cao, Y., Feng, Z., Lu, M., & Shan, Y. (2021) "Tax avoidance and firm risk: Evidence from China", *Accounting & Finance*, *61*(3): 4967-5000. https://doi.org/10.1111/acfi.12769

Chang, C.-S., Yu, S.-W., & Hung, C.-H. (2015) "Firm risk and performance: The role of corporate governance", *Review of Managerial Science*, *9*(1): 141-173. https://doi.org/10.1007/s11846-014-0132-x

Chen, S., Chen, X., Cheng, Q., & Shevlin, T. (2010) "Are family firms more tax aggressive than non-family firms?", *Journal of Financial Economics*, 91(1): 41-61.

Cook, K. A., Moser, W. J., & Omer, T. C. (2017) "Tax avoidance and *ex ante* cost of capital", *Journal of Business Finance & Accounting*, *44*(7-8): 1109-1136. https://doi.org/10.1111/jbfa.12258

Desai, M. A., & Dharmapala, D. (2006) "Corporate tax avoidance and high-powered incentives", *Journal of Financial Economics*, 79: 145-179.

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2008) "Long-run corporate tax avoidance", *The Accounting Review*, *83*(1), 61-82. https://doi.org/10.2308/accr.2008.83.1.61

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2019) "When does tax avoidance result in tax uncertainty?", *The Accounting Review*, *94*(2): 179-203. https://doi.org/10.2308/accr-52198

Frank, M. M., Lynch, L. J., & Rego, S. O. (2009) "Tax reporting aggressiveness and its relation to aggressive financial reporting", *The Accounting Review*, *84*(2): 467-496. https://doi.org/10.2308/accr.2009.84.2.467

Freeman, R. E. (2015) *Strategic management: A stakeholder approach*, Cambridge University Press.

Goh, B. W., Lee, J., Lim, C. Y., & Shevlin, T. (2016) "The effect of corporate tax avoidance on the cost of equity", *The Accounting Review*, *91*(6): 1647-1670. https://doi.org/10.2308/accr-51432

Guedrib, M., & Bougacha, F. (2024) "The moderating effect of tax risk on the relationship between tax avoidance and firm risk: Empirical evidence in the French context", *International Journal of Law and Management*. https://doi.org/10.1108/IJLMA-06-2023-0140

Guenther, D. A., Matsunaga, S. R., & Williams, B. M. (2017) "Is tax avoidance related to firm risk?", *The Accounting Review*, *92*(1): 115-136. https://doi.org/10.2308/accr-51408

Hanlon, M., & Heitzman, S. (2010) "A review of tax research", *Journal of Accounting and Economics*, *50*(2-3): 127-178. https://doi.org/10.1016/j.jacceco.2010.09.002

Harrison, J. S., & Wicks, A. C. (2013) "Stakeholder theory, value, and firm performance", *Business Ethics Quarterly*, *23*(1): 97-124. https://doi.org/10.5840/beq20132314

Hutchens, M., & Rego, S. O. (2015) "Does greater tax risk lead to increased firm risk?", Working paper Available at SSRN: https://ssrn.com/abstract=2186564

Hutchens, M., Rego, S. O., & Williams, B. (2023) "Tax avoidance, uncertainty, and firm risk", Working paper Available at SSRN: https://ssrn.com/abstract=3348559

Jensen, M.C., & Meckling, W. H. (1976) "Theory of the firm: Managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, 3: 305-360

Kim, J.-B., Li, Y., & Zhang, L. (2011) "Corporate tax avoidance and stock price crash risk: Firm-level analysis", *Journal of Financial Economics*, *100*(3): 639-662. https://doi.org/10.1016/j.jfineco.2010.07.007

Kirchler, E., Maciejovsky, B., & Schneider, F. (2003) "Everyday representations of tax avoidance, tax evasion, and tax flight: Do legal differences matter?", *Journal of Economic Psychology*, *24*(4): 535-553. https://doi.org/10.1016/S0167-4870(02)00164-2

Kovermann, J., & Velte, P. (2019) "The impact of corporate governance on corporate tax avoidance—A literature review", *Journal of International Accounting, Auditing and Taxation*, *36*: 100270. https://doi.org/10.1016/j.intaccaudtax.2019.100270

Kramer, J.K., & Peters, J.R. (2001) "An interindustry analysis of economic value added as a proxy for market value added", *Journal of Applied Finance*, 11: 41-49.

Krapl, A. A., Salyer, R., & White, R. S. (2020) "Tax avoidance, tax risk, and the volatility of stock returns", *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3613038

Lanis, R., & Richardson, G. (2011) "The effect of board of director composition on corporate tax aggressiveness", *Journal of Accounting and Public Policy*, *30*(1): 50-70. https://doi.org/10.1016/j.jaccpubpol.2010.09.003

Lin, X., Liu, M., So, S., & Yuen, D. (2019) "Corporate social responsibility, firm performance and tax risk", *Managerial Auditing Journal*, *34*(9): 1101-1130. https://doi.org/10.1108/MAJ-04-2018-1868

Mathew, S., Ibrahim, S., & Archbold, S. (2018) "Corporate governance and firm risk", *Corporate Governance: The International Journal of Business in Society*, *18*(1): 52-67. https://doi.org/10.1108/CG-02-2017-0024

Rego, S. O. (2003) "Tax-avoidance activities of U.S. Multinational Corporations", *Contemporary Accounting Research*, *20*(4): 805-833. https://doi.org/10.1506/VANN-B7UB-GMFA-9E6W

Rego, S. O., & Wilson, R. (2012) "Equity risk incentives and corporate tax aggressiveness", *Journal of Accounting Research*, *50*(3): 775-810. https://doi.org/10.1111/j.1475-679X.2012.00438.x

Sikes, S., & Verrecchia, R. E. (2020) "Aggregate corporate tax avoidance and cost of capital", *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3662733

Steijvers, T., & Niskanen, M. (2014) "Tax aggressiveness in private family firms: An agency perspective", *Journal of Family Business Strategy*, *5*(4): 347-357. https://doi.org/10.1016/j.jfbs.2014.06.001

Wang, F., Xu, S., Sun, J., & Cullinan, C. P. (2020) "Corporate tax avoidance: a literature review and research agenda", *Journal of Economic Surveys*, *34*(4): 793-811. https://doi.org/10.1111/joes.12347

Watson, L. (2015) "Corporate social responsibility, tax avoidance, and earnings performance", *Journal of the American Taxation Association*, *37*(2): 1-21. https://doi.org/10.2308/atax-51022

Yoon, B., Lee, J.-H., & Cho, J.-H. (2021) "The effect of ESG performance on tax avoidance—Evidence from Korea", *Sustainability*, *13*(12): 6729. https://doi.org/10.3390/su13126729

---

[1] *Source:* Organization for Economic Cooperation and Development "OECD" (2023) *'Statistiques des recettes publiques 2023',* https://oe.cd/statistiques-des-recettes-publiques

[2] Chang *et al.* (2015) found consistent results in both directions: in one case, the company's risk is the dependent variable and the company's performance is the independent variable, and vice versa.

[3] *Source:* Organization for Economic Cooperation and Development "OECD" (2023) *'Statistiques des recettes publiques 2023',* https://oe.cd/statistiques-des-recettes-publiques

[4] Automobiles and Parts; Consumer Products and Services; Media; Retail; Travel and Leisure

[5] Food, Beverage and Tobacco, Personal Care, Drug and Grocery Stores