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Tax behavior and resource allocation in family-owned firms

Mhamed Ben Slimane

Higher Institute of Management of Sousse, Tunisia

Email: Mhamed.Benslimane@outlook.fr

ORCID: [0009-0000-4148-2497](https://orcid.org/0009-0000-4148-2497)

Habiba Ladhari

Higher Institute of Management of Sousse, Tunisia

Email: Habiba.Ladhari@outlook.fr

Abstract--The purpose of this study is to examine and better understand the effect of tax avoidance practices on investment inefficiency and to highlight the effect of family ownership as an effective governance mechanism that reduces information asymmetry. The sample covers 3,732 firm-year observations in France from 2009 to 2020. We use panel data regression based on the FGLS regression to examine the effect of tax avoidance on investment inefficiency. The results show that tax avoidance activities leads to exacerbate the level of information asymmetry and consequently inefficient investment behavior. More precisely, we found that tax avoidance is positively associated with underinvestment and we found that there is no significant link between tax avoidance and overinvestment. More importantly, the results show that family ownership mitigates the relationship between corporate tax avoidance and investment inefficiency. This study builds upon prior research by investigating how family ownership influences the link between tax avoidance and investment inefficiency. It delves into how family ownership acts as a governance mechanism to mitigate information asymmetry, safeguard non-financial benefits, and perpetuate the family legacy.

Keywords--Tax avoidance, Investment inefficiency, Family ownership, information asymmetry.

1. Introduction

Tax avoidance has been the subject of debate in the financial and accounting literature. According to Chen et al., (2010), taxes are a significant expense for firms, diminishing both company and shareholder free cash flows. As a result, managers often engage in tax planning activities to minimize these burdens (Bailing and Rui, 2018). Previous research has explored the consequences of corporate tax avoidance such as, trade credit (Hasan et al., 2023), empire building (Shams et al., 2022), corporate social responsibility performance (Abid and Dammak, 2021), bankruptcy risk (Dhawan et al., 2020) and stock price crash risk (Kim et al., 2011), Asiri et al., (2020) and Taylor et al., (2019) investigate the association between corporate tax avoidance activities and investment inefficiency. The authors argue that tax avoidance is positively associated with investment inefficiency suggesting that firms with higher levels of information asymmetry lead managers to over- or under-investment. We aim to dig deeper into the effect of tax avoidance on investment inefficiency by studying how tax avoidance influences investment inefficiency in family firms.

Family firms are often built on values passed down through generations, such as trust, integrity, and a sense of responsibility, which permeate their corporate culture (Gomez-Mejia et al., 2011). Their long-term approach is reflected in their development and investment strategies, prioritizing sustainable growth and the preservation of the family legacy (Berrone et al., 2012). Furthermore, their unique governance, often characterized by close involvement of family members in key decision-making, helps strengthen family ties while requiring specific management mechanisms to navigate family and professional dynamics (Cherif et al., 2020).

Families mitigate agency problems and reduce information asymmetry among firm stakeholders (Edmans, 2009; Anderson et al., 2012; Shahzad et al., 2019). Indeed, the agency problems will be less important in family firms than in non-family firms. Therefore, the level of information asymmetry which leads to a better information environment and to more efficient investment decisions (Biddle et al., 2009; Cheng et al., 2013; Tsao et al., 2015). Thus, there is a large literature that attempts to examine the impact of family ownership on investment inefficiency, but the association between tax avoidance, family ownership, and investment inefficiency has received little attention and interest in accounting research (Shahzad et al., 2019; Moin et al., 2020). It will therefore be interesting to examine in this study the impact of tax avoidance on investment inefficiency and to investigate the moderating role of family ownership on this relationship.

Based on a sample of 311 French listed firms from 2009 to 2020, the results show that there is a positive link between corporate tax avoidance and investment inefficiency. This result is consistent with our predictions, suggesting that firms engaging in higher levels of tax avoidance show a greater propensity for investment inefficiency. We also investigate the effect of tax avoidance on under and over investment. We found that tax avoidance affects positively underinvestment. Indeed, tax avoidance activities aggravate the underinvestment problem. For the overinvestment scenario, we found that there is no significant link between tax avoidance and overinvestment. More importantly, we found that

family ownership leads to mitigate the relationship between tax avoidance and investment inefficiency.

The contribution of this study is twofold. First, this study complements previous research by analyzing the impact of tax avoidance on investment inefficiency by Khurana et al., (2018) and Asiri et al., (2020). This study addresses the gap in the literature by examining how the interplay between tax avoidance strategies and family ownership dynamics influences investment efficiency. Family firms represent a distinct subset of companies with unique governance structures and decision-making processes. They are also well-dominated in the French context (Nekhili et al., 2011). By focusing on the specific context of family firms, this study provides valuable insights into how tax avoidance practices affect investment decisions within these organizations. Secondly, the study underscores the impact of information asymmetry on managers' inefficient investment behavior. Information asymmetry often leads to opportunistic behavior of managers, who may favor empire-building over maximizing shareholder value. By examining the effect of tax avoidance on investment inefficiency through the prism of information asymmetry, this study provides new insights into the underlying mechanisms that influence corporate investment decisions.

The remaining of this study is organized as follows. Section 1 presents a review of the literature on the relationship between tax avoidance and investment efficiency, and the moderating effect of family ownership, and develops hypotheses. Section 2 presents the sample and data, followed by the results and discussion in section 3. The final section is reserved for the study's conclusion.

2. Literature Review and Hypotheses development

2.1. Tax avoidance and Investment Inefficiency

The debate on the relationship between tax avoidance and investment inefficiency has been a topical issue in the accounting literature in recent decades (Chen et al., 2017). Indeed, Desai and Dharmapala, (2009) argue that tax consequences can explain corporate decisions, especially investment decisions.

Therefore, in perfect financial markets, all positive net present value projects (NPV) should be financed and carried out. However, the negative effects of moral hazard and adverse selection problems can lead to the two inefficient investment scenarios: underinvestment and overinvestment (McLean et al., 2012; Chen et al., 2017; Al-Dhamari et al., 2023). Cheng et al., (2021) determined that increasing information transparency, lowering information asymmetry, and reducing agency costs are key to improving investment efficiency.

From the agency theory perspective, investment inefficiency can be explained by the existence of asymmetric information among stakeholders (Jensen and Meckling, 1976; Myers and Majluf, 1984). Information asymmetry can lead managers to distort investment in order to maximize their utility and extract rents through privileged consumption, empire building, career concerns, and preference for a quiet life (Fama, 1980 ; Ahsen and Istiaq, 2008).

Moreover, managers may reduce tax liabilities through tax avoidance practices, given that external financing becomes costly, and corporate tax avoidance appears as a potential source of financing (Edwards et al., 2016). This leads to an opaque internal control system that does not expose illicit transactions. Taylor et al., (2019) found a positive and significant relationship between inefficient investments and tax avoidance. This study suggests that firms with higher levels of information asymmetry lead managers to over- or under-investment. Asiri et al., (2020) highlight a positive association between corporate tax avoidance activities and investment inefficiency, which is mediated by the readability of financial statements, the comparability of financial statements, and competition in the product market.

Lim (2011) highlights that tax avoidance activities are used by managers for expropriation purposes and rent extraction due to their unethical nature and associated information asymmetry levels. Balakrishnan et al., (2019) suggest a positive association between tax avoidance and information asymmetry.

According to the agency theory, we assume that tax avoidance activities lead to exacerbated information asymmetry and is associated with opportunistic managerial behavioral. It is then likely to positively influence investment inefficiency. Our first hypothesis is then as follows:

H1: Corporate tax avoidance is positively related to investment inefficiency.

2.2. The role of family ownership

According to the agency theory developed by Jensen and Meckling (1976), there are two different views regarding the role of family ownership. The first view predicts an alignment of interests' effect between family members and shareholders while the second view predicts an entrenchment effect of family firms to increase their power in the company.

The alignment of interests' hypothesis consists in converging the interests of shareholders with those of managers (Jensen and Meckling, 1976; Chen et al., 2008; Cherif et al., 2020). More specifically, this convergence is supported in family firms (Shahzad et al., 2017; Vieira, 2020). According to Ali et al., (2007), family firms allocate preferential rights to different family members in order to have better control over cash flows and limit opportunistic behavior of managers. Indeed, Chen et al., (2008) document that family firms have a low level of information asymmetry compared to non-family firms. Based on the alignment of interests' effect, Tsao et al., (2015) argue that the reduction of informational gaps is highest in family firms than nonfamily firms which leads to a low level of information asymmetry (Claessens et al., 2000). Specifically, through the bid-ask spread measure Attig et al., (2006) found that the level of information asymmetry is lower in family firms. According to Demsetz and Lehn, (1985) family members tend to have effective supervision over the behavior of managers since the latter have the same degree of information as precedents. This leads them to undertake investments that are more efficient.

Contrary to the view of alignment of interests, the entrenchment view considers that family businesses present a high level of cash flow, which allows family members to extract wealth from minority shareholders (Shahzad et al., 2017).

Schulze et al., (2001) document also that higher level of free cash flow in family firms create a conflicts between controlling insiders and minority outsiders and facilitates rent extraction. According to this view, family firms tend to manipulate their results through the different practices of earnings management which leads to a decrease in financial quality reporting and therefore a higher level of information asymmetry (Cherif et al., 2020).

The two views of the agency theory do not take into account the non-economic objectives of family firms. The socio-emotional wealth theory (SEW theory) states that family firms are motivated and committed to preserving non-financial benefits, including the family's desire to exercise authority, maintaining membership in the company, appointing family members to important positions, and keeping a strong family identity in pursuit of the family dynasty (Gomez-Mejia et al., 2011). In this regard, family firms choose to invest in profitable projects with positive NPV in order to ensure the continuity of business operations for future generations (Berrone et al., 2012; Attig et al., 2016).

To sum up, we maintain that the agency's theory of interest alignment and the model of socioemotional wealth encourage family firms to make effective strategic investment decisions. Thus, family ownership plays a role in reducing the level of information asymmetry and opportunistic management behavior leading to decrease in investment inefficiency (underinvestment and overinvestment).

H2: Family ownership negatively moderates the relationship between tax avoidance and investment inefficiency.

3. Research design

3.1. Sample selection

Our sample includes non-financial French companies listed in the CAC All Shares index. After filtering our data to exclude financial companies and companies with missing data, we obtained a sample of 311 companies over a 12-year period from 2009 to 2020 (3732 observations). We extract all tax, accounting and financial data available from the Worldscope databases. For data that are not available in this database (Family ownership), we collect them manually from the reference documents and annual reports downloaded from the official websites of firms. Furthermore, we winsorize the data at the 1st and 99th percentiles to reduce the probability that outliers touch our results.

3.2. Variables' measurements

Investment Inefficiency:

Following the model of Biddle et al., (2009), we measure investment inefficiency as the residuals from this expected optimal investment level model:

$$\text{Investment}_{i,t+1} = \beta_0 + \beta_1 * \text{Sales Growth}_{i,t} + \xi_{i,t+1}$$

The residuals of the model reveal the deviation from the firm optimal level of investment. Therefore, these residuals are considered as the main proxy for the firm inefficient investments.

Moreover, the positive residuals indicate the overinvestment and the negative residuals' values reflect the underinvestment.

Tax avoidance:

We use ETR measures for tax avoidance variables which is measured by the ratio of total tax expense scaled by total pre-tax income (Dyreng et al., 2008).

Family ownership:

We measure family ownership using a dichotomic variable that takes the value of one if a firm is classified as a family firm, and zero, otherwise. A firm is classified as a family firm if the overall shareholding held by family members is at least 10% of the total shares, and if a family member stands in top management positions (Ali et al., 2007; Beldi et al., 2014; Cherif et al., 2020).

3.3. Control variables

Following the previous literature, we employ control variables that previous studies have identified as determinants of investment inefficiency (Biddle et al., 2009; Cheng et al., 2013, Benlemlih and Bittar, 2018; Asiri et al., 2020). Precisely, we include SIZE measured by Neperian logarithm of total assets. LEV is leverage ratio measured by the ratio of total debts divided by total assets. ROA is return on assets ratio calculated as the amount of net income divided by total assets. According to Khurana et al., (2018) firm profitability affects positively investment inefficiency. R&D is research and development expenditure measured by the ratio of research and development expenditure divided by total assets. FCF refer to free cash flow. Free cash-flow theory assumes that excess cash flow influences firm's investment decision (Faff et al., 2016). We use the model of Gul and Tsui, (1997) in order to measure the free cash flow.

3.4. Model specifications

We use panel data regression equations based on the FGLS regression to study the relationship between tax avoidance and investment inefficiency. Thus, we used the following equation:

$$INEFF_INV_{it} = \beta_0 + \beta_1 ETR_{it} + \beta_2 MKTB_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 R\&D_{it} + \beta_7 FCF_{it} + \beta_8 Industry_Year_FE_{it} + \xi_{it} \quad (1)$$

Where INEFF-INV refers to investment inefficiency, and can take three measures: Investment inefficiency, Underinvestment, and Overinvestment. Tax avoidance is measured by ETR. All control variables are defined in the previous section (Section 3.5).

Following Khurana *et al.*, (2018) and Aksar *et al.*, (2021) for testing moderating effect of family ownership we estimate the following equation:

$$INEFF_INV_{it} = \beta_0 + \beta_1 ETR_{it} + \beta_2 FOWN_{it} + \beta_3 FOWN_{it} * ETR_{it} + \beta_4 MKTB_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \beta_7 ROA_{it} + \beta_8 R\&D_{it} + \beta_9 FCF_{it} + \beta_{10} Industry_Year_FE_{it} + \xi_{it} \quad (2)$$

Where FOWN refers to family ownership and FOWN*ETR is the interaction variable between tax avoidance and family ownership.

4. Results and discussion

4.1. Descriptive statistics

Table I presents the descriptive of our dependent, independent, control and moderate variables. The overall average value of our dependent variable (Investment Inefficiency) is between 2.73e-09 and 0.991. The value of abnormal investments has an average value of 0.047. This average is comparable to the average found by Gomariz *et al.*, (2013). The average total tax expense in our sample is 19.30 (ETR). The mean values of this variable is similar to those

reported in Dyreng *et al.*, (2010). We find also that the proportion of family firms represents 62.1% of French companies. Finally, the mean (median) values of our control variables are similar to those reported in the previous tax avoidance literature (Biddle *et al.*, 2009).

Table I. Descriptive Statistics

Panel A: Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max	Q1	Median	Q3
INEFF	0.047	0.081	2.73e-09	0.991	0.013	0.028	0.042
ETR	0.193	0.133	0.002	0.852	0.101	0.182	0.263
MKTB	8.065	1.085	5.135	11.091	7.260	7.970	8.732
R&D	0.010	0.033	0	0.590	0	0	0.002
FCF	0.045	0.092	-1.074	0.598	0.016	0.049	0.087
ROA	0.041	0.074	-0.495	0.498	0.019	0.041	0.068
LEV	0.220	0.152	0.000	0.696	0.097	0.203	0.320
SIZE	19.970	2.481	14.615	27.499	18.139	19.694	21.691
Moderate Variable							
Dummy Variables		Proportion		SD		Conf-Interval	
FOWN	1	0.621		0.007	0.605	0.636	
	0	0.379			0.363	0.394	

Notes: Panel A presents descriptive statistics of the main variables of interests in our analysis. The sample covers 311 French firms from 2009 to 2020. All variables are defined in Appendix A.

4.2. Regression results

Table II presents the regression results on the effect of tax avoidance and industry and year fixed effects. The results show that tax avoidance are positively and significantly related to investment inefficiency indicating that French firms that engage in high level of tax avoidance activities have an inefficient investment behavior. This finding suggest that tax avoidance strategies can divert resources away from productive investments. As a result, resources that could have been allocated to more productive and growth-enhancing projects end up being channeled into NPV projects by opportunistic managers. This result is consistent with the results found by Asiri *et al.*, (2020) and suggests that companies that practice tax avoidance activities incur a high level of information asymmetry and significant agency costs that in turn lead to sub optimal decisions. For our control variables, the coefficient estimates are consistent with prior studies (Khurana *et al.*, 2018; Asiri *et al.*, 2020).

For underinvestment and overinvestment scenarios, the results show that there is a positive relationship between underinvestment and tax avoidance. Indeed, this result supports the view that firms with high level of tax avoidance practices are more likely to have a high level of information asymmetry which lead them to miss investment opportunities because of high external financing and ultimately to underinvest.

For the overinvestment scenario, our results reported on Table II shows that there is no significant link between tax avoidance and overinvestment. These findings are similar to the results obtained by Khurana *et al.*, (2018). Indeed, French managers do not consider tax savings as a tool that will help them to finance their needs. Instead, they will opportunistically use these finds to extract private benefits of interest through other tunnels than the overinvestment.

Table II Regression results of tax avoidance on Investment Inefficiency, Under-Investment and Over-Investment

	Investment Inefficiency Column 1	Underinvestment Column 2	Overinvestment Column 3
ETR	0.036* (0.019)	0.015*** (0.005)	0.003 (0.010)
Size	-0.001** (0.006)	-0.001 (0.006)	-0.004*** (0.001)
Leverage	0.043*** (0.009)	0.061*** (0.009)	0.042** (0.018)
ROA	0.087*** (0.023)	0.050** (0.024)	0.082** (0.038)
FCF	0.004 (0.007)	0.023 (0.018)	-0.073** (0.034)
R&D	-0.001 (0.002)	-0.008 (0.001)	0.621*** (0.050)
MKTB	0.003 (0.001)	-0.004*** (0.001)	0.005** (0.002)
Constant	0.138*** (0.017)	0.059*** (0.016)	0.254*** (0.029)
Industry, year fixed effects	YES	YES	YES
Wald statistic	249.17	171.87	466.12
Prob>chi2	0.000	0.000	0.000

Notes: This table reports the panel regression results of the effect of corporate tax avoidance on investment inefficiency, underinvestment and overinvestment. All variables are defined in Appendix A. Standard errors in parentheses *** p < 0.01. ** p < 0.05. *p < 0.1.

Our next set of regression results, reported in Table III, considers the association between the family ownership and investment inefficiency, and the interaction effect of the family ownership and tax avoidance on investment inefficiency. The results shows that the coefficient of FOWN is negatively and significantly associated with investment inefficiency. This finding supports the result founded by Shahzad *et al.*, (2018). However, the interaction variable is consistently negative and statistically significant with investment inefficiency. This result suggests that family ownership mitigates the relationship between tax avoidance and investment inefficiency. This result suggest that family firms have a low level of information asymmetry compared to non-family firms (Chen *et al.*, 2008; Attig *et al.*, 2006). Moreover, this result is in line with the key notion of SEW theory. In particular, family businesses operate with a longterm orientation to maintain a strong family identity in the pursuit of the family dynasty. Furthermore, we can conclude that family ownership conduct to less tax avoidance activities and expose lower levels of investment inefficiency.

For the underinvestment scenario, our results show that for the positive association between corporate tax avoidance and under-investment is mitigated in family firms which reduce the problems of information asymmetry and moral hazard. So, we can conclude that family ownership constitutes an efficient mechanism to reduce managerial opportunism and information asymmetry. For the overinvestment scenario, the results suggests that the pressure exerted by family firms attenuates the overinvestment problem. This result suggests that family companies can prioritize long-term goals over immediate tax optimization.

Table III Regression results of the effect of tax avoidance on Investment Inefficiency, Underinvestment and Overinvestment: The moderating role of family ownership

	Investment Inefficiency Column 1	Underinvestment Column 2	Overinvestment Column 3
ETR	0.061** (0.027)	0.251*** (0.022)	0.054 (0.041)
ETR*FOWN	-0.027** (0.011)	-0.054** (0.025)	-0.084*** (0.027)
FOWN	-0.008*** (0.002)	-0.001 (0.004)	-0.035*** (0.007)
SIZE	-0.001*** (0.005)	-0.009 (0.007)	0.006 (0.001)
LEV	0.050*** (0.010)	0.011 (0.016)	0.015 (0.019)
ROA	0.054*** (0.016)	-0.050* (0.026)	-0.068* (0.038)
FCF	0.057** (0.028)	0.074*** (0.021)	0.013 (0.039)
R&D	-0.007 (0.002)	0.003** (0.001)	0.002 (0.002)
MKTB	0.001 (0.001)	-0.005*** (0.001)	-0.009*** (0.003)
Constant	0.148*** (0.016)	0.152*** (0.029)	0.218*** (0.045)
Year, Industry	YES	YES	YES
Fixed effects			
Pseudo R2	0.071	0.296	0.123
Prob>chi2	0.0000	0.0000	0.0000

Notes: This table reports results of the effect of family ownership on the relationship between corporate tax avoidance investment inefficiency, underinvestment and overinvestment. All variables are defined in Appendix A. Standard errors in parentheses *** p < 0.01. ** p < 0.05. *p < 0.1.

4.3. Additional analyses

4.3.1. The role of financial reporting quality

Information asymmetry between firms and suppliers of capital resources can distort investment efficiency by earnings management. For this reason, by decreasing information asymmetry, higher quality financial reporting enhances investment efficiency (Biddle *et al.*, 2009). In this regard, the quality of accounting earnings can help firms to detect investment problems and allow shareholders to evaluate the relevance and effectiveness of investment decisions (Chalevas *et al.*, 2021). Chen *et al.*, (2011) found also that the quality of financial reporting affects investment efficiency. Therefore, we explore the effect of financial reporting quality on the relationship between tax avoidance and investment inefficiency. We choose two measure of accrual earnings management by Modified Jones model (Dechow *et al.*, 1995) and Kothari Model (Kothari *et al.*, 2005). The results reported in Table IV show that the positive association between tax avoidance and investment

inefficiency is more pronounced in firms who practice earnings management activities. Indeed, in situations of low financial reporting quality, agency costs tend to be higher as it becomes harder for external stakeholders to monitor and hold management accountable. Tax avoidance strategies are employed to manipulate financial results or divert resources for personal gain, it undermines the efficient allocation of investments and leads to suboptimal decision-making by managers.

4.3.2. The role of information asymmetry

Given that information asymmetry leads to investment inefficiencies, we explore the moderating effect of information asymmetry on the relationship between tax avoidance and investment inefficiency. Following Attig *et al.*, (2006), we measure information asymmetry by the average Quarterly Bid-Ask Spread. Table IV show that firms with higher level of exacerbating information asymmetry have more investment inefficiency behavior. The results show also that the positive association between tax avoidance and investment inefficiency is more pronounced for firms with higher level of information asymmetry.

4.3.3. The effect of Covid-19 pandemic

The period of Covid-19 was characterized by an economic slowdown that affected many sectors of activity, and subsequently influenced the investment behavior of many companies. Table IV shows that corporate tax avoidance has a greater positive effect on investment inefficiency during the Covid pandemic. This result suggests that uncertainty surrounding the severity of the crisis, as well as its long-term economic impact, can influence investment decisions. In such uncertain times, businesses may become more risk-averse and prioritize short-term strategies, including tax planning, over long-term investment. This can result in a reduced focus on productive investments and a greater tendency toward suboptimal investment choices.

Table IV Regression results of the impact of earnings management, information asymmetry and covid19 on the relation between corporate tax avoidance and investment inefficiency

	Panel (A): Fited-Jones Column 1	Panel (B): Fited- Kothari et al., (2005) Column 2	Panel (C): Information asymmetry Column 3	Panel (D): Covid 19 Column 4
ETR	0.022 (0.020)	0.031* (0.019)	--	0.033* (0.017)
ETR* EM	0.039*** (0.014)	0.188** (0.079)	--	--
ETR* Inf-Asy	--	--	--	--
ETR*Covid	--	--	--	0.956*** (0.272)
EM	0.214* (0.133)	0.021*** (0.007)	--	--
Inf-Asy	--	--	--	--
Covid 19	--	--	--	0.047*** (0.012)
Controls Variables	YES	YES	YES	YES

Industry year fixed effects	YES	YES	YES	YES
Wald statistic	252.50	253.57	250.55	188.22
Prob>chi2	0.0000	0.0000	0.0000	0.000

Notes: This table reports the panel regression results of the effect of earnings management, information asymmetry and covid19 on the relationship between corporate tax avoidance investment inefficiency. All variables are defined in Appendix A. Standard errors in parentheses *** p < 0.01. ** p < 0.05. *p < 0.1.

4.4. Robustness checks

4.4.1. Alternative measures of tax avoidance

We use two long-run ETR measures of corporate tax avoidance. The first measure is ETR5 measured by the ratio of total tax expense over the last five years scaled by total pre-tax income net over the same period (Dyreg *et al.*, 2008). The second measure is CETR5 estimated as the five-year centered moving sum of cash paid for income taxes over five years scaled by the moving sum of pre-tax income over the same period (see Dyreg *et al.*, 2008). This generates an effective cash tax rate that more closely tracks the firm's tax costs over the long run, and it avoids year-to-year volatility in annual effective tax rates. The results are presented in Table V. We proved that tax avoidance affects positively investment inefficiency and underinvestment. The results are similar to our previous results.

Table V. Alternative measures of tax avoidance

	Investment Inefficiency		Underinvestment		Overinvestment	
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
ETR5	0.024*** (0.006)	--	0.036*** (0.006)	--	0.005 (0.011)	--
CETR5	--	0.025*** (0.006)	--	0.036*** (0.006)	--	0.012 (0.011)
Size	-0.001*** (0.005)	-0.001*** (0.005)	-0.002 (0.005)	-0.001 (0.005)	-0.004*** (0.001)	-0.004*** (0.001)
Leverage	0.055*** (0.008)	0.054*** (0.008)	0.062*** (0.009)	-0.063*** (0.009)	0.042** (0.018)	0.042** (0.018)
ROA	0.065*** (0.021)	0.067*** (0.021)	0.056** (0.024)	0.060** (0.024)	0.082** (0.038)	0.081** (0.038)
FCF	0.022 (0.017)	0.020 (0.017)	0.017 (0.018)	0.018 (0.018)	-0.073** (0.034)	-0.071** (0.034)
R&D	-0.645*** (0.038)	-0.648*** (0.038)	-0.001 (0.001)	-0.001 (0.001)	0.619*** (0.050)	0.623*** (0.050)
MKTB	0.001 (0.001)	0.001 (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	0.005** (0.002)	0.005** (0.002)
Constant	0.141*** (0.015)	0.142*** (0.015)	0.074*** (0.016)	-0.072*** (0.016)	0.256*** (0.029)	0.258*** (0.029)
Industry, year fixed effects	YES	YES	YES	YES	YES	YES
Wald statistic	586.80	587.45	196.77	193.61	466.21	466.07
Prob>chi2	0.000	0.000	0.000	0.000	0.000	0.000

Notes: This table reports the panel regression results of the effect of corporate tax avoidance on investment inefficiency, underinvestment and overinvestment using alternatives measures of tax avoidance. All variables are defined in Appendix A. Standard errors in parentheses *** p < 0.01. ** p < 0.05. *p < 0.1.

4.4.2. Family subsample analysis

We split the sample into two subgroups Family firms (FF) and non-family firms (NFF). We assume that in family firms, the relationship between corporate tax avoidance and investment inefficiency is less prevalent. More specifically, our results of Table VI show that the effect of tax avoidance on investment inefficiency is less pronounced in family firms. The results are similar to our previous results.

Table VI. Regression results of the impact Corporate Tax Avoidance and Investment Inefficiency in Family and Non-Family firms

	Family Firms Column 1	Non Family Firms Column 2
ETR	0.027 (0.029)	0.093** (0.042)
Size	-0.056 (0.067)	-0.003*** (0.087)
Leverage	0.055*** (0.014)	0.071*** (0.014)
ROA	0.078*** (0.021)	0.035 (0.024)
FCF	0.056* (0.033)	0.089** (0.043)
R&D	0.684*** (0.034)	0.049 (0.026)
MKT B	0.002 (0.016)	0.025 (0.015)
Constant	0.145*** (0.024)	0.136*** (0.021)
Industry, year fixed effects	YES	YES
R-squared	0.127	0.068
Prob>chi2	0.000	0.000

Notes: The table presents the results of the effect of tax avoidance on investment inefficiency in family and non-family firms. All variables are defined in Appendix A. Standard errors in parentheses *** p < 0.01. ** p < 0.05. *p < 0.1.

4.4.3. Endogeneity Issues

Propensity Score matching:

This method consists of dividing our sample into two subgroups (treatment group and control group). The sample split is based on the annual average level of tax avoidance. Indeed, companies below the median of the ETR constitute the treatment group while those above the median constitute the control group (Armstrong *et al.*, 2012; Asiri *et al.*, 2021). In first stage, we run logit regression models for tax avoidance measure with control variables. This step guarantees the existence of a balance between the treated and untreated subjects in the matched sample. The propensity scores estimated in the first step are used to match each firm with firm in our control observation. The results of Table VII show that tax avoidance has a positive and significant effect on investment inefficiency, these results are similar to those found in the main analysis.

The Generalized Method of Moments (GMM):

Modeling under GMM makes it possible to prevent problems of endogeneity bias at the level of the estimation equation linked to causality of exogenous variables, problems of simultaneity bias, reverse causality. The results of GMM estimations reported in Table VII show that the effect of corporate tax avoidance on investment inefficiency remains positively significant.

Table VII. Endogeneity Issues

	PSM	GMM
	Column 1	Column 2
ETR	0.177*** (0.050)	0.068*** (0.016)
Control variables	YES	YES
Constant	2.715*** (0.256)	-0.759** (-2.497)
Industry fixed effects	YES	NO
Pseudo R2	0.036	--
Prob>chi2	0.000	--
Sargan test	--	0.000
AR1 (p-value)	--	0.001
AR2 (p-value)	--	0.125

Notes: The table presents regression results of Propensity Score Matching and GMM. All variables are defined in Appendix A. Standard errors in parentheses *** p < 0.01. ** p < 0.05. *p < 0.1.

5. Conclusion

This paper investigates the association between corporate tax avoidance and investment behavior in French listed firms using a sample of 3732 firm-year observations. The results show that there is a positive link between tax avoidance and investment inefficiency, and particularly, with the decisions to underinvest. This result suggests that managers who use tax avoidance activities are more likely to under invest than to over invest. Indeed, French managers do not consider tax savings as a tool that will help them to finance their needs. This finding indicates that companies engaging in tax avoidance activities incur a high level of information asymmetry and significant agency costs which in turn lead to sub optimal investment decision. We found also that family ownership mitigates the relationship between tax avoidance and investment inefficiency. Our finding supports that family firms have an efficient investment behavior given the low level of information asymmetry compared to non-family firms.

These results have several implications for managers, investors and policymakers. First, managers should be aware of the potential negative consequences of tax avoidance on investment efficiency. They should consider the long-term implications of tax planning strategies and strive for a balanced approach that aligns with the overall goals of the company. Second, investors should focus on the long-term prospects and sustainable growth potential of a company, rather than being solely influenced by short-term tax optimization. Finally, Policymakers should consider implementing or strengthening regulations that discourage aggressive tax planning and promote responsible tax practices in family firms. This can include measures to enhance transparency, improve financial reporting quality, and establish stricter guidelines for tax planning.

One of the limitations of this study is that we have only worked in a single context, namely France. We suggest that future research be carried out in an

international context to study the effect of tax avoidance on the cost of debt, the risk of bankruptcy and stock price crash risk.

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Appendix A

Variable	Definition
INEFF-INV	Biddle <i>et al.</i> , model (2009).
ETR	The ratio of total tax expense scaled by total pre-tax income.
ETR5	The ratio of total tax expense over the last five years scaled by total pre-tax income net over the same period.
CETR5	Sum of cash paid for income taxes over five years scaled by the moving sum of pre-tax income over the same period.
MKTB	Market To Book ratio calculated as market value divided by total equity.
SIZE	Neperian logarithm of total assets.
Leverage	Total debts divided by total assets.
ROA	Net income divided by total assets.
FCF	Gul et Tsui(1997) model.
R&D	Research and development expenditure divided by total assets.
FOWN	Family ownership is a dichotomic variable that takes the value of one if a firm is classified as a family firm, and zero, otherwise. A firm is classified as a family firm if the overall shareholding held by family members is at least 10% of the total shares, and if one or more directors on the board of directors are from the same family.
Earnings management (EM)	- Modified Jones model (Dechow et al., 1995) and Kothari et al. (2005)
Covid19	A dummy variable in which the value of 1 represents the Covid-19 period, which is 2020 while a value of 0 represents a year that is not affected by Covid-19.
Information Asymmetry	We measure information asymmetry by the average Quarterly Bid-Ask Spread. We calculate the average value of the quarterly bid-ask spread, measured as $(Ask-Bid)/[(Ask+Bid)/2]$. Bid-Ask is the posted spread at which a dealer is willing to sell and the price at which he is willing to buy a certain share.