Research on the Impact of Corporate Tax Avoidance Behavior on Financial Risk

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Abstract: Whether corporate tax avoidance will increase financial risk has been a controversial topic. On the one hand, tax avoidance may help enterprises reduce their tax burden and increase their cash flow, thus enhancing their financial soundness. On the other hand, tax avoidance may also lead to a series of agency problems, earnings management problems and financialization problems, thus increasing the financial soundness of enterprises. lead to a series of agency problems, earnings management problems and financialization problems, thus increasing the financial risk of enterprises. This paper constructs a panel regression model to empirically test the relationship between corporate income tax avoidance and financial risk using a sample of Chinese listed companies from 2007 to 2022. Meanwhile, the reverse causality and endogeneity issues of the sample are analysed and robustness tests are conducted to ensure the reliability of the regression results. The paper analyses the heterogeneity of internal control quality, ownership and shareholding concentration and examines the three mechanisms influencing internal control quality. Finally, this paper analyzes the heterogeneity of internal control quality, property rights and equity concentration, and discusses the three influencing mechanisms of agency cost, earnings management and financialization level.

Keywords: Tax Avoidance Behavior; Financial Risks; Agency Cost; Earnings Management; Financialization Level

1. Introduction

While tax avoidance practices are a common financial management tool designed to minimize tax liabilities through legal means and provide businesses with more capital for operations, growth and innovation. However, whether corporate tax avoidance behavior exacerbates financial risks has been a controversial topic. On the one hand, tax avoidance behavior may help enterprises reduce their tax burden and increase cash flow, thus enhancing their financial soundness. On the other hand, tax avoidance may also lead to a series of agency problems, surplus management problems and financialization problems, thus increasing the financial risk of enterprises. In this regard, the paper pays particular attention to the three dimensions of agency cost, surplus management and degree of financialisation, exploring their influence mechanisms and comprehensively analysing the relationship between corporate tax avoidance and financial risk. This not only leads to a deeper understanding of corporate tax avoidance behaviour, maintaining financial health while avoiding taxes, potential risks and provides useful clues for the formulation of financial strategies, but also helps investors to better understand potential financial risks so that they can make more informed investment decisions.

2. Literature Review and Theory Analysis

2.1 Theoretical Relationship between Corporate Tax Avoidance Behavior and Financial Risk

Rational tax avoidance is a key strategic initiative in corporate financial management. Through the reasonable use of tax law provisions of exemptions, credits and other preferential policies, enterprises are able to minimize their tax obligations, reduce the tax burden, not only to reduce tax expenditures, but also to obtain policy support and guidance. Reasonable use of tax planning can optimise the capital flow of enterprises and enhance

profitability. After reducing the tax burden, enterprises can invest the saved funds in their core business, effectively improve operational efficiency and market competitiveness, and then achieve profit growth [1]. Through legal tax avoidance, enterprises can reduce their operating costs and enhance market competitiveness without jeopardizing the order of market competition. In times of economic fluctuations, legal tax avoidance can also provide enterprises with a certain financial buffer to help them tide over difficulties and maintain operational stability [2,3].

The moderate use of tax avoidance can help enterprises effectively reduce financial risks, but with the excessive intensification of tax avoidance behavior, it may lead to new risks and problems [4,5]. As the degree of tax avoidance increases, enterprises need to adopt more complex and hidden financial operations, which not only increase the cost of financial processing, but also may lead to opaque financial status. It increases the difficulty for management to control the financial situation, which leads to decision-making errors or delays, and then affects the overall operation of the enterprise [6]. Secondly, excessive tax evasion is easy to detect and, if uncovered, may not only trigger in-depth investigations by regulators, but also bring down the company's credit rating, increase the risk of litigation, fines, etc [7].

Based on this, hypothesis H1 is proposed: Corporate tax avoidance and financial risk have a non-linear U-shaped relationship, i.e., financial risk decreases and then increases when the degree of tax avoidance increases.

2.2 Mechanism Analysis
2.2.1 Agency costs
Through moderate tax avoidance, enterprises can minimize their tax liabilities and increase the company's net profit within the framework of legal compliance. By lowering the tax burden and increasing the company's net profit, it creates more value for shareholders, mitigates the conflict of interest between the company's management and shareholders, and jointly pursues the company's maximum interests [8]. When the agency cost decreases, the company is able to supervise and manage the agent's behavior more effectively, reduce the information asymmetry and compliance risk, enhance the financial transparency,

reduce the moral risk, and then enhance the overall governance level and financial stability, enhance operational effectiveness of the company, thereby mitigate financial risks.

However, overreliance on tax avoidance may lead to rising agency costs for enterprises. When enterprises adopt overly complex and difficult-to-understand financial instruments in the process of excessive tax avoidance, or pursue extreme tax reduction by manipulating financial information or exploiting legal loopholes, it increases the information asymmetry between company management and shareholders. This may lead to shareholders not being able to truly understand the company's financial situation, which in turn makes it difficult to effectively monitor and discipline management's behavior. In this case, because management is more likely to pursue personal self-interest in an opaque financial structure rather than maximizing long-term shareholder value, agency costs may rise [9].

Based on this, hypothesis H2 is proposed: Corporate tax avoidance and agency costs have a U-shaped relationship, with agency costs decreasing and then increasing when the degree of tax avoidance increases.

2.2.2 Surplus management
The moderate use of legitimate tax shelters helps companies maintain a reasonable level of surplus management, thereby mitigating financial risk. Enterprises are able to adjust surpluses, reasonably reduce taxable income, increase net profits, and make the company's financial statements accurate and credible. When the degree of surplus management decreases, enterprises can more rationally assess their own financial position and market environment, make sound and sustainable decisions, and thus reduce the financial risks caused by decision-making errors. In addition, the decline in the degree of surplus management means that enterprises pay more attention to honest management and compliance development, which helps enterprises establish a good image, attract more investors and partners, and create a more favorable development environment for enterprises. All this helps to increase investors' trust in the company, reduce information asymmetry, and mitigate agency costs, thus contributing to the reduction of financial risks [10,11].

However, over-reliance on tax shelters may make it more difficult for companies to manage their surpluses and may lead to untrue and opaque financial statements, increasing financial risks. Companies may manipulate surpluses to make them appear healthier in order to attract investors or obtain more favorable financing terms. However, such excess management obscures the true economic situation, which can arouse investor suspicion and mistrust, increase the likelihood of information asymmetry, which in turn increases a company's agency costs, and even lead to a misjudgement of its true financial health. Excessive reliance on surplus management may also lead to the inability of the company to detect and respond to financial crises in the future, increasing the company's financial risk [12,13].

Based on this, hypothesis H3 is proposed: Corporate tax avoidance is positively related to the level of surplus management; the higher the level of tax avoidance, the higher the level of surplus management.

2.2.3 Level of financialization

The moderate use of legal tax avoidance helps enterprises to effectively reduce agency costs and thus reduce financialisation. Enterprises can reduce tax liabilities and increase net profits within the scope of legal compliance, thereby reducing conflicts of interest between enterprise management and shareholders. It helps to mitigate the increase in agency costs, making companies more inclined to use internal funds to support their business activities, reducing the need for external financing and lowering the level of financialization. A moderate tax avoidance strategy can also enable the company to be more robust in its financial management and reduce its reliance on financial instruments [14,15].

However, overreliance on tax avoidance instruments may lead to an increase in the level of financialization of enterprises and exacerbate financial risks. When enterprises excessively pursue the benefits of tax avoidance, they may adopt highly financialized financial instruments, especially in an environment of high market volatility or rising interest rates, and may increase the financial risks faced by the enterprise. And excessive tax avoidance behavior may also trigger conflicts and conflicts of interest between

owners and operators, leading to rising agency costs. Companies may be more inclined to invest their capital in the financial markets in order to make short-term profits, which would reinforce the trend towards financialisation and financial risks [16-18].

On this basis, the paper proposes hypothesis H4: Corporate tax avoidance and the level of financialisation have a U-shaped relationship, with the level of financialisation decreasing and then increasing as the level of tax avoidance increases.

3. Study Design

3.1 Modeling

Through theoretical analyses, corporate tax avoidance has a non-linear relationship with financial risk. For this reason, the regression analysis model shown in equation (1) is constructed, and both the explanatory variables and their quadratic terms are added to the model:

$$OSCORE_{i,t} = \alpha + \beta TAXA_{i,t} + \delta TAXA_{i,t}^2 + \sum \gamma_k Control_{i,t}^k + \mu_d + \gamma_t + \varepsilon_{i,t} \quad (1)$$

Where $OSCORE_{i,t}$ is the explanatory variable financial risk, $TAXA_{i,t}$ is the explanatory variable corporate tax avoidance behavior, $TAXA_{i,t}^2$ is the quadratic term of the explanatory variable, $Control_{i,t}^k$ is the control variable of this paper, μ_d is the industry fixed effect, γ_t is the year fixed effect, and $\varepsilon_{i,t}$ is the residual term. After estimating equation (4.1), observing the two regression coefficients of β and δ, if β is significantly less than 0 and δ is significantly greater than 0. In order to examine the three influencing mechanisms of agency cost, surplus management and financialization level, the regression analysis model shown in equation (2) is constructed with reference to the previous research method [19]. Based on the estimation results of equation (1), this paper identifies the inflection point of the U-shaped relationship between corporate tax avoidance and financial risk, and accordingly divides the sample into the left and right sides of the inflection point, and further calculates the exact location of this inflection point.

$$M_{i,t} = \alpha + \beta TAXA_{i,t} + \sum \gamma_k Control_{i,t}^k + \mu_d + \gamma_t + \varepsilon_{i,t} \quad (2)$$

Where $M_{i,t}$ denotes the mechanism variables

including agency costs $COST_{i,t}$, surplus management $MANAGE_{i,t}$ and financialization level $FIN_{i,t}$. After estimating equation (4.2), observe the regression coefficient β. According to the theoretical analysis in the previous section of this paper, for agency cost, it should be significantly less than 0 on the left side of the U-curve β and significantly greater than 0 on the right side of the U-curve β; for surplus management, it should be significantly greater than 0 on both sides of the U-curve β; for the level of financialization, it should be significantly less than 0 on the left side of the U-curve β, while it should be significantly greater than 0 on the right side of the U-curve β.

3.2 Data Sources and Variable Measures
In this study, companies listed on the Shanghai and Shenzhen stock exchanges from 2007 to 2022 are selected as samples, and the screening criteria are: excluding the financial industry, ST and *ST companies, excluding companies with missing income tax rates or abnormal effective tax rates (less than 0 or greater than 1), and excluding companies with a large number of missing variables. In order to reduce the impact of outliers, continuous variables in the regression model are reduced-tailed within the 1% and 99% quartiles. The variables are described as shown in Table 1.

Table 1. Summary of variables

Variable type	variable name	variable symbol	Variable Definition
explanatory variable	tax avoidance	TAXA	Difference between nominal income tax rate less effective income tax rate
explanatory variable	financial risk	OSCORE	O-index calculated using the O-Score model
intermediary variable	agency cost	COST	Administrative expenses as a percentage of operating income
	surplus management	MANAGE	Calculation of Manipulable Accrued Profits Using the Modified Jones Model
	Level of financialization	FIN	Financial assets to total assets
control variable	Enterprise size	SIZE	Natural logarithm of total asset size
	Corporate leverage	LEV	Ratio of total liability size to total asset size
	Corporate Growth	GROWTH	Growth rate of operating income for the year compared to the previous year
	shareholding concentration	OWNCON	Shareholding of top ten shareholders
	Fixed asset holdings	FIX	Ratio of fixed asset size to total asset size
	two jobs in one	TJIO	1 if the company has both a chairman and a chief executive officer, 0 otherwise
	cash holdings	CASH	Ratio of size of cash holdings to total assets of listed companies
	return on net assets	ROE	Ratio of net profit to net assets of listed companies

3.3 Descriptive Statistics
As shown in Table 2 of, the mean value of the explanatory variable 'financial risk' is -8.8765, the standard deviation is 2.1312, the minimum value is -16.2666, and the maximum value is -1.692. The closer the value of the variable is to 0, the higher the financial risk is. The gap between the maximum value and the mean value is large, indicating that the level of corporate financial risk varies significantly. The explanatory variable 'tax avoidance' has a mean value of 0.0037, a standard deviation of 0.1116, a minimum value of -0.4204 and a maximum value of 0.2347. The positive mean of this variable indicates that most listed companies have an effective income tax rate lower than the nominal rate, suggesting that tax avoidance may be a common phenomenon among enterprises.

Table 2. Descriptive Statistics

VARIABLES	N	Mean	SD	Min	Max.
OSCORE	29555	-8.8765	2.1312	-16.2666	-1.692

TAXA	29555	0.0037	0.1116	-0.4204	0.2347
COST	29543	0.0818	0.0698	0.0083	0.6039
MANAGE	28456	0.0201	0.0659	-0.0841	0.1592
FIN	29554	0.0455	0.0824	0	0.4692
SIZE	29555	22.2794	1.3221	18.9123	26.0998
LEV	29555	2.1564	1.6598	0.5384	7.853
GROWTH	29493	0.2732	0.5086	-0.3558	1.7853
OWNCON	28360	0.5763	0.1504	0.2267	0.9535
FIX	29553	0.2183	0.1622	0.0002	0.9709
TJIO	29555	0.2471	0.4313	0	1
CASH	29554	0.1552	0.1078	0.0263	0.4650
ROE	29458	0.0921	0.0755	-0.8425	0.4927

4. Empirical Research

4.1 Benchmark Regression Analysis

As shown in Table 3, The regression in column (1) shows a U-shaped relationship between tax avoidance and financial risk with a coefficient on the primary term of -1.2101 and a coefficient on the secondary term of 11.2270, both of which are significant (p<0.01). This relationship is further confirmed by the inclusion of control variables with a primary term coefficient of -0.6211 and a secondary term coefficient of 4.9889, which are still significant.

Based on the estimation results in column (2), the optimal threshold for tax avoidance is calculated to be 0.0622, indicating that moderate tax avoidance behaviour can help reduce firms' financial risk. However, if tax avoidance exceeds this threshold, financial risk will tend to increase rather than decrease. The study divides the sample into the left and right parts of the U-curve and further conducts linear regression analyses in order to explore in depth the relationship between corporate tax avoidance and financial risk; the results are presented in Table 4.

In the regression in column (1), the coefficient of tax avoidance is -2.5011 and significantly negative, indicating that on the left side of the U-curve, financial risk decreases when corporate tax avoidance increases. In the regression in column (2), the coefficient of tax avoidance is 1.8499 and significantly positive, indicating that on the right side of the U-curve, financial risk increases when corporate tax avoidance increases.

4.2 Endogeneity Issues

Table 5 In the reverse causality test, In the regression of column (1), the coefficient of the primary term of tax avoidance is significantly negative and the coefficient of the quadratic term is significantly positive, which indicates that when the degree of tax avoidance of enterprises increases, the financial risk shows a non-linear U-shaped relationship that decreases first and then increases. In column (2), after adding control variables, the coefficient of the primary term is significantly negative and the coefficient of the secondary term is significantly positive, which further confirms this U-shaped relationship, and hypothesis H1 still holds.

In the sample selection problem test, the coefficient of the primary term of tax avoidance in column (1) is significantly negative and the coefficient of the quadratic term is significantly positive, indicating that the higher the degree of tax avoidance of the enterprise, the financial risk shows a U-shaped relationship that decreases first and then increases. After adding control variables in column (2), the coefficient of the primary term is significantly negative and the coefficient of the secondary term is significantly positive, which again confirms the non-linear U-shaped relationship between corporate tax avoidance and financial risk. Hypothesis H1 still holds.

Table 3. Results of Benchmark Regression Analysis of Corporate Tax Avoidance Behavior Affecting Financial Risks

	(1)	(2)
VARIABLES	OSCORE	OSCORE
TAXA	-1.2101***	-0.6211***
	(-9.8320)	(-6.8433)
TAXA2	11.2270***	4.9889***
	(23.8923)	(14.5145)
SIZE		-0.0765***
		(-10.1019)
LEV		-0.5473***
		(-128.1288)
GROWTH		0.2132***
		(12.1838)
OWNCON		-0.7456***
		(-13.1237)
FIX		-1.0416***
		(-15.7657)
TJIO		0.0147
		(0.7659)
CASH		-2.1059***
		(-25.5996)

ROE		-5.6282***
		(-48.2771)
Constant	-9.0210***	-4.5539***
	(-716.7670)	(-26.3855)
Industry-FE	Control	Control
Year-FE	Control	Control
Observations	29,469	28,166
R-squared	0.2012	0.5984

Note: ***, **, and * indicate that regression coefficients are significant at the 1%, 5%, and 10% significance levels, respectively; t-values are in parentheses. Same below.

Table 4. Benchmark Regression Analysis Results for both Sides of the U-curve

VARIABLES	(1) Left side of the inflection point	(2) Right side of the inflection point
	OSCORE	OSCORE
TAXA	-2.5011***	1.8499***
	(-25.4767)	(4.7195)
SIZE	-0.0226***	-0.2145***
	(-2.6973)	(-12.8750)
LEV	-0.5485***	-0.5109***
	(-118.2296)	(-51.9214)
GROWTH	0.1807***	0.2712***
	(9.4686)	(6.8957)
OWNCON	-0.6830***	-0.5746***
	(-10.8754)	(-4.6117)
FIX	-1.3286***	-0.1373
	(-18.2837)	(-0.9400)
TJIO	0.0325	-0.0374
	(1.5500)	(-0.8654)
CASH	-2.1133***	-2.0727***
	(-23.7607)	(-10.8317)
ROE	-6.1981***	-3.7179***
	(-45.5084)	(-16.3097)
Constant	-5.6959***	-2.2196***
	(-29.7715)	(-5.7450)
Industry-FE	Control	Control
Year-FE	Control	Control
Observations	21,488	6,677
R-squared	0.6455	0.4964

Table 5. Results of Endogeneity Problem Analysis

VARIABLES	The problem of reverse causation (1) OSCORE	The problem of reverse causation (2) OSCORE	Sample selection issues (1) OSCORE	Sample selection issues (2) OSCORE
TAXA	-11.4996***	-6.1062***	-1.7566***	-0.7660***
	(-5.5369)	(-2.8608)	(0.1294)	(0.0906)
TAXA2	27.1000**	37.4173***	8.8020***	3.2220***
	(2.2036)	(3.1030)	(0.4875)	(0.3420)
Control	N	Y	N	Y
Constant	-	-	-8.9532***	-5.4712***
	-	-	(0.0128)	(0.1751)
Industry-FE	Control	Control	Control	Control
Year-FE	Control	Control	Control	Control
Observations	29,469	28,166	25,416	25,416
R-squared	-	-	0.2041	0.6197

4.3 Robustness Tests

4.3.1 Replacement of the explanatory variable with the explanatory variable

The results of the robustness tests are as follows: the first two columns of Table 6 show a U-shaped relationship between tax avoidance and financial risk after replacing the original financial risk indicator with the Altman Z-score. Specifically, column (1) shows that the coefficient of the primary term of tax avoidance is significantly negative and the coefficient of the secondary term is significantly positive; after adding control variables in column (2), the U-shaped relationship is still significant, which supports hypothesis H1.

The last two columns of Table 6 show the regression results of replacing the tax avoidance indicator with the 'five-year average of the difference between the nominal tax rate and the effective tax rate'. The results show a U-shaped relationship between tax avoidance and financial risk. In column (1), the coefficients of the first term of tax avoidance are significantly negative and the coefficients of the second term are significantly positive, and the U-shaped relationship remains robust with the addition of control variables in column (2). Hypothesis H1 still holds.

Table 6. Robustness Test Results for Replacing Explanatory Variables

VARIABLES	Substitution of explanatory variables (1) OSCORE	Substitution of explanatory variables (2) OSCORE	Substitution of explanatory variables (1) OSCORE	Substitution of explanatory variables (2) OSCORE
TAXA	-1.3153***	-0.2738**	-2.9294***	-1.3152***
	(-8.0614)	(-2.1959)	(-18.1137)	(-11.2151)
TAXA2	7.2680***	1.8777***	21.4224***	9.0576***
	(11.6664)	(3.9700)	(20.4333)	(12.0186)
Control	N	Y	N	Y
Constant	-4.2102***	-16.5692***	-9.0530***	-5.2623***
	(-253.6761)	(-69.9721)	(-711.3913)	(-30.2438)
Industry-FE	Control	Control	Control	Control
Year-FE	Control	Control	Control	Control
Observations	29,244	27,963	28,360	27,152
R-squared	0.2295	0.5912	0.2028	0.6125

4.3.2 Removal of anomalous periods

The first two columns of Table 7 present the results of the analysis excluding the effect of the 2008 financial crisis. The data in column (1) show that the coefficients on the first term of tax avoidance are significantly negative and the coefficients on the second term are significantly positive, suggesting that an increase in the level of tax avoidance by firms leads to a decrease and then an increase in financial risk. The results in column (2) after adding control variables still support this non-linear U-shaped relationship, where the coefficient of the first term of tax avoidance is -0.6216 and the coefficient of the second term is 5.0909.

The last two columns of Table 7, on the other hand, reflect the results of the analysis after excluding the 2020-2022 epidemic data. Column (3) shows that the coefficient on the first term of tax avoidance is significantly negative and the coefficient on the second term is significantly positive, implying that increased tax avoidance by firms reduces and then increases financial risk. Column (4) shows the coefficient of the first-order term and the coefficient of the second-order term of tax avoidance after the inclusion of control variables, further confirming the non-linear U-shaped relationship between tax avoidance and financial risk. This indicates that hypothesis H1 holds true in different contexts.

Table 7. Robustness Test Results Excluding Outlier Periods

VARIABLES	(1)	(2)	(3)	(4)
	Excluding the period of the 2008 financial crisis		Excluding the 2020-2022 period of the new crown epidemic	
	OSCORE	OSCORE	OSCORE	OSCORE
TAXA	-1.2655***	-0.6216***	-1.0630***	-0.6512***
	(-10.0894)	(-6.7151)	(-7.4221)	(-6.2216)
TAXA2	11.2048***	5.0909***	11.6366***	5.4671***
	(23.3896)	(14.5171)	(21.5828)	(14.0035)
Control	N	Y	N	Y
Constant	-9.0473***	-4.6397***	-8.8955***	-5.0943***
	(-708.8751)	(-26.4911)	(-610.1343)	(-25.1555)
Industry-FE	Control	Control	Control	Control
Year-FE	Control	Control	Control	Control
Observations	28,588	27,298	21,462	21,359
R-squared	0.1984	0.5971	0.2025	0.5886

4.3.3 Addition of a fixed-effects dimension

After adding individual firm fixed effects to the basic regression model, the results are shown in the first two columns of Table 8.The data in column (1) show that the coefficient on the primary term of tax avoidance is -1.2186, significantly negative at the 1% level, and the coefficient on the secondary term is 4.2702, significantly positive at the 1% level, revealing a tendency for firms to initially reduce their financial risk by increasing their level of tax avoidance, and then to subsequently increase their risk. The results in column (2) after adding the control variables still support this U-shaped relationship, with the coefficient of the primary term of tax avoidance being -0.5540, significantly negative at the 1% level, and the coefficient of the secondary term being 2.1263, significantly positive at the 1% level. After the model further incorporates individual firm fixed effects and province-year fixed

effects, as shown in the last two columns of Table 8, the coefficient on the first term of tax avoidance in column (3) is -1.2166, which is significantly negative at the 1% level, and the coefficient on the second term is 3.8893, which is significantly positive at the 1% level, again suggesting that an increase in the level of tax avoidance leads to a decrease in financial risk before an increase. After adding control variables in column (4), the coefficient of the first term of tax avoidance is -0.5094, which is significantly negative at the 1% level, and the coefficient of the second term is 1.9623, which is significantly positive at the 1% level, which further verifies the non-linear U-shaped relationship between corporate tax avoidance and financial risk. Even after adding fixed effects, hypothesis H1 still holds.

4.4 Heterogeneity Analysis

The first two columns of Table 9 present the

results of the heterogeneity analysis for firms with different internal control quality. The group of firms with high internal control quality (column 1) shows a significant negative coefficient on the primary term of tax avoidance (-0.8772, 1% level) and a significant positive coefficient on the secondary term (2.6283, 1% level), suggesting that financial risk decreases and then increases as the level of tax avoidance increases. The group of firms with low quality of internal control (column 2) shows a similar trend, but the coefficient of the second level term is larger (5.8245, 1% level), indicating a more significant change in financial risk.

Table 8. Robustness Test Results for Adding Fixed Effect Dimensions

VARIABLES	(1) OSCORE	(2) OSCORE	(3) OSCORE	(4) OSCORE
TAXA	-1.2186***	-0.5540***	-1.2166***	-0.5094***
	(-12.1183)	(-6.6328)	(-11.3438)	(-5.6941)
TAXA2	4.2702***	2.1263***	3.8893***	1.9623***
	(11.6100)	(7.0829)	(10.0672)	(6.1948)
Control	N	Y	N	Y
Constant	-8.9126***	-8.0107***	-8.9738***	-8.2033***
	(-1,043.1139)	(-24.5177)	(-1,043.9269)	(-23.0873)
Industry-FE	Control	Control	Control	Control
Year-FE	Control	Control	No	No
Code-FE	Control	Control	Control	Control
Province-Year-FE	No	No	Control	Control
Observations	28,885	27,719	27,023	25,893
R-squared	0.7086	0.8156	0.7306	0.8302

The middle two columns of Table 9 analyse the heterogeneity of firms across ownership types. The coefficient of the first term of tax avoidance for the group of publicly owned enterprises (column 3) is significantly negative (-1.0526, 1% level) and the coefficient of the second term is significantly positive (4.1685, 1% level), indicating that financial risk decreases and then rises with an increase in the degree of tax avoidance. The private enterprise group (column 4), on the other hand, shows that the coefficient of the first term of tax avoidance is significantly negative (-0.3150) and the coefficient of the second term is significantly positive (5.1332, 1 per cent level) at the 5 per cent level, again supporting a U-shaped relationship.

The last two columns of Table 9 explore the heterogeneity of firms with different levels of equity concentration. The coefficient on the first term of tax avoidance is significantly negative (-0.7558, 1% level) and the coefficient on the second term of tax avoidance is significantly positive (4.3094, 1% level) for the high equity concentration group of firms (column 5), suggesting that financial risk decreases and then increases as the level of tax avoidance increases. The group of firms with low equity concentration (column 6) shows a similar trend, with a significant negative coefficient on the first term of tax avoidance (-0.5240, at the 1% level) and a significant positive coefficient on the second term (5.3833, at the 1% level), further confirming the U-shaped relationship between tax avoidance and financial risk.

4.5 Impact Mechanisms
The first two columns of Table 10 demonstrate the mechanism by which agency costs are affected. Column (1) shows that the regression coefficient of tax avoidance is significantly negative, indicating that on the left side of the U-curve, an increase in the degree of tax avoidance reduces agency costs. While column (2) shows that the regression coefficient of tax avoidance is significantly positive, indicating that on the right side of the U-curve, an increase in the degree of tax avoidance leads to a gradual increase in agency costs, validating hypothesis H2.

The three middle columns of Table 10 analyse the mechanism of the impact of surplus management. The data in columns (1) to (3) show that on the left side of the U-curve, the regression coefficient of tax avoidance is significantly positive, implying that an increase in the degree of tax avoidance

enhances surplus management; on the right side of the U-curve, the coefficient is still positive, and column (3) further confirms the positive effect of tax avoidance on surplus management, verifying hypothesis H3.

The last two columns of Table 10 analyse the impact mechanism of the degree of financialisation. Regarding the degree of financialisation, column (1) shows that the

regression coefficient of tax avoidance is significantly negative, implying that on the left side of the U-curve, an increase in tax avoidance decreases the degree of financialisation, while the coefficient turns positive in column (2), indicating that on the right side of the U-curve, an increase in tax avoidance raises the degree of financialisation.

Table 9. Results of Heterogeneity Analysis

	Quality of internal controls		Nature of property rights		shareholding concentration	
	(1)	(2)	(1)	(2)	(1)	(2)
VARIABLES	High Internal Control Quality Group	Low internal control quality group	State-owned enterprise group	Private enterprise group	High equity concentration group	Low equity concentration group
	OSCORE	OSCORE	OSCORE	OSCORE	OSCORE	OSCORE
TAXA	-0.8772***	-0.5568***	-1.0526***	-0.3150**	-0.7558***	-0.5240***
	(-6.5790)	(-4.4913)	(-8.3206)	(-2.3652)	(-5.3968)	(-4.3978)
TAXA2	2.6283***	5.8245***	4.1685***	5.1332***	4.3094***	5.3833***
	(4.7499)	(12.9875)	(8.9799)	(9.8330)	(7.9361)	(12.1204)
Constant	-5.2653***	-4.8449***	-2.9710***	-5.4386***	-4.8629***	-4.3469***
	(-22.7493)	(-17.8012)	(-11.4445)	(-21.0298)	(-19.7085)	(-16.4928)
Industry-FE	Control	Control	Control	Control	Control	Control
Year-FE	Control	Control	Control	Control	Control	Control
Observations	14,387	13,776	11,507	15,460	14,091	14,072
R-squared	0.6370	0.5750	0.5693	0.6141	0.6305	0.5632

Table 10. Results of Impact Mechanism Analysis

	agency cost		surplus management			Level of financialization	
	(1)	(2)	(1)	(2)	(3)	(1)	(2)
VARIABLES	Left side of the inflection point	Right side of the inflection point	Left side of the inflection point	Right side of the inflection point	full sample	Left side of the inflection point	Right side of the inflection point
	COST	COST	MANAGE	MANAGE	MANAGE	FIN	FIN
TAXA	-0.0490***	0.1596***	0.0326***	0.0393*	0.0227***	-2.2143***	4.4207***
	(-12.2163)	(9.2638)	(6.6563)	(1.6567)	(6.2568)	(-29.4991)	(15.1378)
Constant	0.3216***	0.3836***	0.0484***	-0.0942*	0.0402***	-0.7140***	1.1221***
	(41.1505)	(22.5892)	(5.1005)	(-1.9098)	(4.9104)	(-4.8811)	(3.8983)
Industry-FE	Control	Control	Control	Control	Control	Control	Control
Year-FE	Control	Control	Control	Control	Control	Control	Control
Observations	21,488	6,677	21,006	6,286	27,292	21,487	6,677
R-squared	0.3331	0.2957	0.1589	0.4372	0.1521	0.1059	0.1572

5. Conclusions and Recommendations

5.1 Conclusions of the Study

This paper delves into the relationship between corporate income tax avoidance and financial risk through an empirical study of A-share listed companies in China from 2007 to 2022. The research results show that:

First, there is a significant non-linear U-shaped relationship between corporate income tax avoidance and financial risk. Specifically, as the degree of corporate tax avoidance increases, the financial risk shows a trend of decreasing first and then increasing. When enterprises moderately avoid taxes, they are able to enhance financial robustness by reducing tax

burden and increasing cash flow, thus reducing financial risk. However, when firms avoid taxes excessively, they may face more complex financial operations, higher regulatory risks, and potential reputational losses, all of which can lead to increased financial risk. This finding remains robust across different scenarios, including robustness tests such as substituting explanatory variables, excluding abnormal periods, and including fixed effects.

Second, the relationship between corporate income tax avoidance and agency costs shows the same nonlinear U-shaped relationship. When tax avoidance is moderate, enterprises are able to increase shareholder value and alleviate the conflict of interest between

management and shareholders by reasonably reducing their tax burden, thus reducing agency costs. However, when firms rely excessively on sophisticated tax avoidance, information asymmetry increases and shareholders find it difficult to effectively monitor management behaviour, leading to an increase in agency costs. This suggests that firms need to weigh short-term benefits against long-term governance costs when formulating tax avoidance strategies.

Third, the study finds that there is a significant positive relationship between corporate income tax avoidance and surplus management. As the degree of tax avoidance increases, the level of corporate surplus management increases accordingly. This suggests that firms may optimise their financial statements by adjusting their surpluses, thereby masking their true financial position to some extent. While moderate surplus management may help enterprises maintain reasonable financial indicators, excessive surplus management may lead to distortion of financial statements, increase information asymmetry, and thus aggravate financial risks.

Fourth, the relationship between corporate income tax avoidance and the level of financialisation also shows a non-linear U-shaped relationship. Moderate tax avoidance helps enterprises reduce their tax burden and reduce their reliance on external financing, thus reducing the level of financialisation. However, when enterprises excessively pursue tax avoidance benefits, they may rely more on financial instruments for short-term speculation, which will lead to an increase in the level of financialisation, and thus increase the financial risk of enterprises. This suggests that enterprises need to handle the use of financial instruments carefully in the tax avoidance process to avoid the potential risks associated with excessive financialisation.

5.2 Policy Recommendations

First, enterprises use tax avoidance strategies prudently, focusing on balancing short-term economic interests with long-term financial soundness. Enterprises need to avoid taxes within the legal and ethical framework. Enterprises should consider the long-term perspective, avoid over-reliance on tax avoidance to pursue short-term economic benefits, find a balance between short-term and long-term goals, and develop sustainable financial strategies to maintain financial soundness.

Second, enterprises should establish a comprehensive set of internal control mechanisms to ensure the legality and compliance of tax avoidance practices. Internal audits should be conducted regularly to review the implementation of tax avoidance strategies to ensure that they comply with regulatory requirements. Enterprises need to comprehensively analyze the various risks involved in tax avoidance to formulate appropriate risk management strategies. In this way, enterprises can more comprehensively understand the potential impact of tax avoidance behavior on financial risk, and formulate targeted preventive measures to improve the overall risk resilience.

Thirdly, proactive communication strategies should be adopted to improve the transparency of communication between enterprises and stakeholders. Enterprises should ensure that financial reports are accurate, clear and in compliance with relevant regulations and accounting standards. Enterprises can proactively explain the logic behind tax avoidance and the legality of tax avoidance to stakeholders through regular shareholders' meetings, financial analysts' meetings, and other forms of communication. Through such communication, enterprises can reduce potential misunderstandings, increase transparency, and reduce financial risks.

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