

# Tax Avoidance Activities and Investment Efficiency

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**Abstract.** Tax avoidance activities tend to aggravate the degree of information asymmetry inside and outside the enterprise, and will distort incentive contracts and cause agency problems. Information asymmetry and agency problems are important reasons for inefficient investment. Therefore, this paper expects that the higher the degree of tax avoidance of enterprises, the lower the investment efficiency.

## 1. Introduction

A large number of existing studies have found that information asymmetry and agency conflict are important factors affecting investment efficiency. Managers' adverse selection and moral hazard problems caused by information asymmetry will reduce the investment efficiency of enterprises, and the agency conflict will make the interests between the principal and the agent inconsistent, so that the investment decision of the enterprise will deviate from the goal of maximizing the value of the enterprise. This will also reduce the investment efficiency of enterprises. The concept of tax avoidance has consistently found that corporate tax avoidance activities will not only aggravate the degree of asymmetry of enterprises, but also cause the internal incentive mechanism to be invalid, causing agency problems. Therefore, we predict that given other conditions, the higher the degree of tax avoidance, the lower the investment efficiency. Using the data of Chinese listed companies from 2009 to 2018, the results of empirical analysis show that the higher the degree of tax avoidance of enterprises, the more serious the non-efficiency investment, which confirms the research hypothesis of this paper.

## 2. Theoretical analysis and research hypothesis

### 2.1 Corporate tax avoidance will aggravate the degree of information asymmetry inside and outside the company

Desai et al. (2007) It was found that the insiders of Russian oil companies have carried out a lot of short-selling and transfer of corporate wealth through the information asymmetry caused by tax avoidance activities. Chen et al. (2011) Directly examines the relationship between corporate tax avoidance and information transparency. They use four indicators to measure the transparency of the company's information, and find that the higher the tax avoidance of the company, the lower the transparency of information. Lu Wei et al. (2011) based on data from Chinese listed companies, found that corporate tax avoidance activities reduced the information content of stocks. Kim et al. (2011) found that people will hide bad news through tax avoidance, so tax avoidance will make the company's stocks more likely to plunge in the future. These four articles provide direct evidence that tax avoidance will exacerbate corporate information asymmetry.

## 2.2 Corporate tax avoidance can cause agency problems

Barile found that, although in general, high incentives for agents would lead to high pay, when introducing tax avoidance in the analytical framework, agents would exhibit opportunistic behavior and would be less willing to pay for the company's wealth growth. Work hard.

Based on the above analysis, we present the research hypothesis of this paper: Under other conditions, the higher the tax avoidance of the enterprise, the lower the investment efficiency.

## 3. Research design

### 3.1 Empirical model

$$INEFFINV_{i,t} = \alpha_0 + \alpha_1 Ta_{i,t} + \alpha_2 FCF_{i,t} + \alpha_3 NEG_{i,t} + \alpha_4 NEG_{i,t} FCF_{i,t} + \alpha_5 IND_{i,t} + \alpha_6 TOP1_{i,t} + \alpha_7 BSIZE_{i,t} + \alpha_8 DUAL_{i,t} + \alpha_9 MANHO_{i,t} + \alpha_{10} HBS_{i,t} + \alpha_{11} INSTI_{i,t} + \alpha_{12} SOE_{i,t} + \alpha_{13} MKT_{i,t} + YEAR + INDUSTRY + \gamma_{i,t} \quad (1)$$

### 3.2 Variable definitions

#### 3.2.1 Dependent variable (non-efficiency investment)

Drawing on Richardson (2006), we estimate INEFFINV by model (2):

$$INV_{i,t} = \beta_0 + \beta_1 INV_{i,t-1} + \beta_2 CASH_{i,t-1} + \beta_3 SIZE_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 GROW_{i,t-1} + \beta_6 RET_{i,t-1} + \beta_7 AGE_{i,t-1} + YEAR + INDUSTRY + \delta_{i,t} \quad (2)$$

Among them,  $INV_{i,t}$  is the amount of new capital investment of the enterprise in the current year,  $INV = (\text{Cash for the purchase and construction of fixed assets, intangible assets and other long-term assets} - \text{net cash recovered from disposal of fixed assets, intangible assets and other long-term assets}) / \text{total assets at the beginning of the period}$ ;  $CASH_{i,t-1}$  is the amount of money held by the company in the previous year, equal to the monetary fund divided by the total assets at the beginning of the period;  $SIZE_{i,t-1}$  is the natural logarithm of the total assets of the enterprise at the end of the previous year;  $LEV_{i,t-1}$  is the asset-liability ratio of the company in the previous year;  $GROW_{i,t-1}$  is the growth of the company last year;  $RET_{i,t-1}$  is the company's stock return for the previous year;  $AGE_{i,t-1}$  is the age of the company last year;  $YEAR$  and  $INDUSTRY$  are the annual and industry dummy variables.

We obtain the fixed-capital regression of the model (2) (see Table 1 for the regression results), and obtain the expected capital investment amount of each enterprise in the year  $t$ . Then, we subtract the expected capital investment amount from the actual capital investment of the enterprise, and then we can get the unexpected capital investment amount of the enterprise, namely  $\gamma_{i,t}$ . It is generally believed that when  $\gamma_{i,t}$  is less than 0, it means that the enterprise is under-invested. When  $\gamma_{i,t}$  is greater than 0, it means excessive capital. Therefore, we take the absolute value of  $\gamma_{i,t}$ , named INEFFINV, which means the company's non-efficiency investment. It can be seen from the results in Table 1 that each variable is significant at 5% and below, and the regression symbols are consistent with expectations. This shows that the investment forecasting model fits well with the sample in this paper.

Table 1. Investment forecasting model estimation result.

variables	$INV_{i,t-1}$	$CASH_{i,t-1}$	$SIZE_{i,t-1}$	$LEV_{i,t-1}$	$GROW_{i,t-1}$	$RET_{i,t-1}$	$AGE_{i,t-1}$	N	R2
coefficient	0.231***	0.113***	-0.015***	-0.055**	0.008***	0.007***	0.001***	10023	0.129
t-value	16.54	10.98	-7.29	-8.16	4.59	5.21	2.87		

Note:\*\*\* and \*\* indicate that the 1% and 5% levels are significant; the t value is calculated based on the robust standard deviation; Table 1 does not report the regression results of the constant term, annual and industry dummy variables.

#### 3.2.2 Independent variable (degree of tax avoidance)

Most foreign documents directly use the actual tax rate to describe the degree of tax avoidance of enterprises. When the actual tax rate of enterprises is lower, the degree of tax avoidance is higher. However, unlike foreign tax policies, Chinese listed companies enjoy a wide range of tax incentives, so the nominal tax rates of companies are not the same, and the 2008 income tax reform has also caused China's benchmark income tax rate to occur. This leads to a direct measurement of the actual

tax rate if the current income tax expense/pre-tax total profit is used to cause the horizontal and vertical incompatibility between the companies. In order to make this indicator more in line with China's reality, we have also considered the company's nominal income tax rate when calculating the actual tax rate. We use the nominal income tax rate minus the actual income tax rate to measure the degree of tax avoidance of the company, namely RATE.

### 3.2.3 Control variables

The amount of free cash flow in an enterprise is an important factor affecting over-investment or under-investment. To this end, we control the company's free cash flow (FCF). The free cash flow of the enterprise is equal to the net cash flow from operating activities minus the estimated capital investment of the model (2). Considering that the dependent variable of this paper is the absolute value of the non-efficiency investment, we set a dummy variable NEG with a free cash flow sign (when FCF is less than 0, NEG takes 1; otherwise 0), and NEG and FCF are multiplied.

We also control corporate governance related variables in the model (1). Agent conflict is an important factor affecting the efficiency of enterprise investment, while corporate governance can comprehensively reflect the seriousness of corporate agency conflict. Specifically, we control the following corporate governance variables: The proportion of independent directors (IND) equals the number of independent directors divided by the total number of directors; the shareholding ratio of the largest shareholder (TOP1); the size of the board of directors (BSIZE), equals The natural logarithm of the total number of directors; the two-in-one (DUAL) of the chairman and general manager, DUAL takes 1 when two positions are held by one person, otherwise 0; management shareholding ratio (MANHO); Other exchanges listed (HBS), when the company is listed in the US or Hong Kong, HBS takes 1; otherwise 0; institutional investor shareholding ratio (INSTI); corporate property rights (SOE), when the ultimate controller is the country sometimes, SOE takes 1 otherwise 0.

In addition, the institutional environment in the region where the company is located is also an important factor affecting the efficiency of its investment. Therefore, we control the marketization process (MKT) in the region where the company is located. MKT uses the index of the marketization process index of each region disclosed by Fan Gang and Wang Xiaolu (2010). Finally, we also added annual and industry dummy variables to the model.

## 3.3 Sample selection

This paper uses all A-share listed companies in China from 2009 to 2018 as the initial sample. In order to eliminate the effects of outliers, we have tail-finished the continuous variables in the model at the 1% and 99% levels. All data in this paper are taken from the WIND database except for the nominal income tax rate of the enterprise, and other data are derived from the CSMAR database.

## 3.4 Descriptive statistics

I present the descriptive statistics of the variables in Table 2. The average value of INEFFINV is 0.051, which means that on average, the inefficient investment of the sample company is about 5% of the total assets. Among the tax avoidance indicators, the average and median RATE are positive, which indicates that the actual tax rate of most sample companies is lower than the nominal tax rate, that is, tax avoidance may be a common phenomenon, which is also consistent with the reality in China.

Table 2. Descriptive statistics of variables.

Variables	Observations	average value	Standard deviation	median
INEFFINV	10023	0.051	0.050	0.037
RATE	10023	0.020	0.297	0.014
FCF	9131	-0.005	0.098	-0.007
IND	10023	0.303	0.124	0.332
TOP1	10023	0.389	0.153	0.370
BSIZE	10023	2.226	0.222	2.198
DUAL	10023	0.131	0.338	0.000
MANHO	10023	0.006	0.034	0.000
HBS	10023	0.109	0.311	0.000
INSTI	10023	0.125	0.187	0.032
SOE	10023	0.708	0.456	1.000
MKT	10023	6.849	2.247	6.473

#### 4. Empirical test results and analysis

##### 4.1 Empirical test of research hypothesis

I present the least squares regression results of the study hypothesis in Table 3. The regression coefficient of RATE is 0.005, which means that each additional unit of RATE (that is, the difference between the nominal income tax rate and the actual income tax rate increases by 1 percentage point) will result in a non-efficiency investment rising by 0.005 units, which is equivalent to 10% of the average efficiency investment (0.005 / 0.051). To a certain extent, this shows that the impact of tax avoidance on investment efficiency is not only statistically significant, but also economically significant.

Table 3. Empirical test results of the impact of tax avoidance on investment efficiency

Variables	RATE	FCF	NEG	NEG*FCF	IND	TOP1	BSIZE	DUAL
INEFFINV	0.005*** (3.56)	0.134*** (8.70)	0.003** (2.39)	-0.214*** (-11.43)	0.012 (1.47)	-0.003 (-0.93)	0.004* (1.76)	0.003* (1.82)
Variable	MANHO	HBS	INSTI	SOE	MKT	Intercept	N	R <sup>2</sup>
INEFFINV	0.003 (0.20)	-0.003* (-1.95)	0.004 (1.14)	-0.004*** (-3.50)	-0.001*** (-2.94)	0.035*** (4.84)	10023	0.086

Note: \*\*\*, \*\*, and \* indicate significant levels of 1%, 5%, and 10%, respectively; the numbers in parentheses are t values; the calculation of t values is based on robust standard deviation; to save space, unannounced annual and industry dummy variables Regression results.

In the regression results of other variables, the regression coefficients of FCF and NEG\* FCF are both at a confidence level of 1%, which indicates that free cash flow can significantly affect the investment efficiency of enterprises. In the regression results of corporate governance variables, most of the regression coefficients of BSIZE are significantly positive, which indicates that the larger the board of directors, the lower the investment efficiency. This may be due to the fact that large-scale boards are difficult to form effective communication and thus operate inefficiently; DUAL's regression coefficients are significantly positive at a 10% confidence level, indicating that companies with two jobs have lower investment efficiency; HBS The regression coefficients are all significantly negative at the 10% confidence level, indicating that companies listed on the same overseas are more efficient in investing, which may be due to the higher transparency of such companies. In addition, the regression coefficient of SOE is significantly negative at the 1% confidence level, which indicates that the non-investment efficiency of state-owned enterprises is lower than that of non-state-owned enterprises. This is basically consistent with the discovery that the central government and provincial government-controlled state-owned enterprises discovered by Tan Yan et al. (2011) have a lower

degree of over-investment. Finally, we find that the regional marketization process (MKT) can significantly reduce the company's non-efficiency investment, which shows that accelerating market-oriented reforms can improve the efficiency of resource allocation.

Then, the impact of tax avoidance on investment efficiency is whether tax avoidance will promote excessive investment, or insufficient investment? Based on this, we divide the sample into two parts: over-investment group and under-investment group. The unreported regression results show that in the over-investment group, the regression coefficient of the tax avoidance indicator is significantly positive at the 1% confidence level, indicating that the higher the degree of tax avoidance, the greater the degree of over-investment. However, in the under-investment group, the regression coefficient of tax avoidance indicators is not significant. This comprehensively shows that tax avoidance activities mainly lead to excessive investment by enterprises, and there is only very weak evidence that tax avoidance activities will lead to insufficient investment. The cause of this regression may be that tax avoidance activities will leave a portion of the funds that should have flowed to the government, which will increase the company's free cash flow and cause excessive investment (Jensen, 1986).

#### **4.2 Robustness test**

For the empirical test results of the research hypothesis, we performed the following robustness test: Self-selection problem. For the conclusion that corporate tax avoidance leads to excessive investment, there may be self-selection bias. Because over-invested companies are likely to have a lack of internal cash flow, such companies will choose to avoid tax. Therefore, corporate tax avoidance may be a self-selective behavior of over-investment companies. To rule out the impact of this self-selection bias on the conclusions of this paper, we use the Heckman two-stage regression method. Specifically, we first establish a model of corporate tax avoidance probability. After probit regression, the model obtains the Inverse Mills Ratio (IMR) value of the company's tax avoidance, and then adds the IMR value to the model (1) to re-regress. The results of the Heckman self-selection bias model correction show that the regression coefficient of the tax avoidance indicator is still significantly positive ( $t = 2.65$ ). This shows that the conclusions of this paper are not affected by self-selection bias.

Based on the above-mentioned robustness test, we also studied the impact of the tax evasion activities of the first phase of the enterprise on the current investment efficiency, and the research conclusions still have no substantive changes. In addition, we also excluded the sample of current income tax expense less than 0, and the conclusion remains unchanged.

#### **5. Conclusion**

Using the data of Chinese listed companies from 2009 to 2018, it is found that corporate tax avoidance activities reduce investment efficiency. The conclusions of this paper effectively supplement and expand the recent research on tax avoidance agency concept, and also help us to further understand the economic consequences of corporate tax avoidance behavior and the path of tax avoidance to corporate value. In addition, the conclusions of this paper also provide incremental empirical evidence for the study of the factors affecting the efficiency of corporate investment.

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