

# Environmental Pollution Control Investment and Corporate Tax Avoidance

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**Abstract:** Environmental pollution control investment is an important financial guarantee for local environmental pollution control. Will excessive capital investment cause tax avoidance by micro-enterprises? This paper uses the data onto Shanghai and Shenzhen A-share listed companies from 2009 to 2017 to empirically study the relationship between environmental pollution control investment and corporate tax avoidance. The results of the study found that there is a significant negative correlation between environmental pollution control investment and corporate tax avoidance. The results are still valid after the robustness test. We use the mediation effect to test and find the investment has increased the financial pressure on the local government, forcing the government to strengthen taxation supervision, and thus inhibiting corporate tax avoidance. This article provides suggestions for the coordinated governance of environmental governance and corporate governance in China.

**Keywords:** corporate tax avoidance; environmental pollution control investment; financial pressure

## 1 Introduction

With the rapid development of China's economy, environmental pollution problems are becoming more and more serious. According to the "2020 Global Environmental Performance Index (EPI) Report" jointly released by the Center of Environmental Law and Policy of Yale University, Columbia University International Earth Science Information Network (CIESIN) and the World Economic Forum (WEF), China's EPI score is 37.3, which ranks 120th among the 180 countries and regions participating in the evaluation. Obviously, the overall ranking is relatively low. Although ecological and environmental protection has been incorporated into China's national strategy since the 18th National Congress of the Communist Party, the overall government effect is still terrible.

How to effectively achieve the goal of environmental governance? Wang et al. (2014)<sup>[1]</sup> believe that environmental pollution control investment and corporate technological innovation are measures to effectively control environmental problems. Among them, pollution control investment plays an important role in mitigating environmental pollution in end-of-line governance. According to the "China Environmental Statistics Yearbook", the total investment in environmental pollution control in the country increased from 525.8 billion yuan to 953.9 billion yuan from 2009 to 2017, of which the amount dedicated to industrial pollution control increased from 44.2 billion yuan to 681 billion yuan. The investment in environmental pollution control accounted for more than 1% of GDP from 2009 to 2017. The increasing scale of

environmental control investment has made a certain contribution to environmental governance. However, in the process of environmental governance, the role of the enterprise cannot be ignored. They are the main producers of environmental pollution. So they should take more responsibility for environmental governance. According to the negative externality theory of environmental costs, companies are unwilling to bear the cost of environmental pollution control, and tend to avoid disadvantages when faced with external environmental regulations<sup>[2]</sup>. Will the government's increase in investment in environmental governance also affect the behavior of micro-enterprises?

Corporate taxation, as the main source of regional fiscal revenue, is affected by factors such as taxation intensity<sup>[3]</sup>, financing constraints<sup>[4]</sup>, and the level of auditors<sup>[5]</sup>, which can create cash flow effects for companies<sup>[6, 7]</sup>. Studies have proved that companies transfer environmental governance costs of tax avoidance. This article further studies this issue.

The structure of the rest is as follows: the second part is a theoretical analysis and research hypotheses, the third part is research design, the fourth part is empirical results and analysis, and the last part is research conclusions.

## **2 Theoretical analysis and research hypothesis**

Enterprise and government are the two main bodies of regional environmental governance. First of all, from the government's point of view, one of the ways that the government fulfills its environmental governance obligations in the region is to invest in environmental investment, to adequately increase the funds needed for urban infrastructure construction and the disposal of industrial waste generated by industrial enterprises. Environmental pollution control investment is one of the most important elements in the process of environmental governance, and it is also one of the effective measures to control and improve the air quality. There are two sources of investment. One is from the central government, such as funds allocated by the central government, financial subsidies to local governments, and subsidies for sewage charges; the other is from local governments, including fiscal funds and tax revenues. In this process, the local government, which is the main body of local environmental governance, is not limited to supervision obligations, but also means that it needs to invest part of the capital for environmental infrastructure construction and bear part of the pollution control costs. This has strengthened the government's financial burden and increased financial pressure. If the local environmental pollution becomes more serious, the higher the environmental governance cost invested by the local government will be, and the greater the financial pressure will be. From the perspective of enterprises, enterprises in the region have the obligation to pay corporate income tax on time, as well as the obligation to protect the environment. When the government is facing greater fiscal pressure and the central transfer payment is not enough to cope with the pressure, increasing the supervision of corporate income tax taxation is an important measure to alleviate fiscal pressure. Based on the above inference, the following hypotheses are proposed:

H1: Environmental pollution control investment can effectively suppress corporate tax avoidance.

How is the above-mentioned suppression effect achieved? Environmental governance is a

macroscopic local government behavior, while corporate tax avoidance is a corporate governance issue for micro-enterprises. The mechanism remains to be studied. China implemented the tax-sharing reform in 1994. In this reform, the power of fiscal revenue distribution is highly concentrated on the central government. Local governments only have relatively autonomous powers in developing the economy and controlling expenditures. As a result, the decentralization of expenditure power and financial power has led to the formation of another important feature of China's fiscal system—vertical imbalances. The specific manifestations are as follows: First, the higher-level government has more control over financial resources, and the expenditure responsibility is more borne by the lower-level government; the second is because of its own financial resources. The mismatch between expenditure responsibilities has caused lower-level governments to rely heavily on transfer payments for higher-level governments. At the same time, it has increased the level of fiscal and taxation of local governments to local enterprises. The vertical imbalance of the fiscal system is particularly prominent among central governments. When the amount of investment in environmental governance increases, the financial pressure on local governments will also increase. The specific manifestation is that the government's fiscal budgetary expenditure will increase. The more the government's outflow of funds, the more easily the free cash flow will be restricted. Economic development and environmental governance will be simultaneously promoted. Fiscal pressure has increased significantly. Therefore, environmental pollution control has increased the budgetary expenditures of the local government's fiscal budget and increased the government's fiscal pressure, thereby inhibiting corporate tax avoidance. Based on this, the following hypotheses are proposed:

H2: Environmental pollution control investment has increased the budgetary expenditures within the government, thereby suppressing corporate tax avoidance.

### 3 Research design

#### 3.1 Sample selection and data sources

This article selects the data onto Shanghai and Shenzhen A-share listed companies from 2009 to 2017 for research. To ensure the data quality, the following types of firms are excluded: (1) financial listed firms; (2) S, ST, \*\*ST, S\*\*ST, PT, etc.; (3) firms with pre-tax profit less than 0; (4) firms with abnormal actual income tax rates (greater than 1 and less than 0); (5) firms from Tibet and Hainan, which have fewer samples.

We finally got 13,905 effective observations from 2,576 listed companies. The environmental governance investment data in this article comes from the "China Environmental Statistical Yearbook", the relevant financial data comes from the "China Financial Statistics Yearbook", and the company's financial-related data comes from the CSMAR and WIND.

#### 3.2 Model and variable

Assume the verification of H1. This paper establishes the following research model to test the relationship between environmental governance investment and corporate tax avoidance.

$$TA1 = \beta_0 + \beta_1 EnvInvest_{i,t} + \sum(\beta_j \times Control_{i,t}) + Year_{i,t} + Industry_{i,t} + \varepsilon_{i,t} \quad (1)$$

In the above model, TA1 is the degree of corporate tax avoidance; EnvInvest is the amount of investment in environmental governance by local governments; the remaining variables are control variables. The model controls year and industry variables. In this model, the corporate tax avoidance degree index and the environmental governance investment amount index are regressed. If  $\beta_1$  is significantly negative, it means that the more the environmental pollution control investment, the less tax avoidance the company will behavior, and H1 is verified.

Assume the verification of H2. This paper uses the mediation effect test to conduct empirical analysis to verify the mediation effect of government fiscal pressure. Drawing on the research of Wen et al. (2014)<sup>[8]</sup>, this paper designs the following mediation effect test model to verify H2:

$$Egfc_t = \alpha_0 + \alpha_1 EnvInvest_{i,t} + \sum(\alpha_j \times Control_{i,t}) + Year_{i,t} + Industry_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$TA1 = \alpha_0 + \alpha_1 EnvInvest_{i,t} + \alpha_2 Egfc_{i,t} + \sum(\alpha_j \times Control_{i,t}) + Year_{i,t} + Industry_{i,t} + \varepsilon_{i,t} \quad (3)$$

In the above model, Egfc represents the budget expenditure of the local government's fiscal budget, and Control represents the control variables. According to the principle of the establishment of the mediation effect, based on the establishment of model (1), first use model (2) to test the relationship between the explanatory variables and the intermediate variables, and then put the explanatory variables and the intermediate variables into the model (3) to test at the same time, if the above-mentioned coefficient  $\alpha_1$  is significantly positive, indicating that the amount of investment in local governance will increase the budgetary expenditure of the government's fiscal budget, which will increase the financial pressure on the local government. At the same time, if  $\alpha_2$  is significant, the intermediary effect is established, indicating that the hypothesis H2 is established.

## 4 Empirical Results

### 4.1 Descriptive statistics

Table 1 lists the descriptive statistical results of major variable. As can be seen from the table, the mean value of TA1 is -0.0306, indicating that the differences in corporate tax avoidance among the sample companies are obvious. There is a large gap between the maximum and minimum values of TA 1, EnvInvest and Egfc.

**Table1.** Result of descriptive statistics

Variables	N	Mean	Max
TA1	13905	-0.0306	0.2423
EnvInvest	13905	5.7309	6.8591
Egfc	13769	15.8716	18.0386
Size	13905	22.1169	25.9963
Roa	13905	0.0497	0.1927
Lev	13905	0.4294	0.8579
Ppe	13905	0.2212	0.7038

Intang	13905	0.0459	0.3128
Invent	13905	0.1624	0.7335
Inv	13905	0.0071	0.0946
Age	13905	21.0822	68.0000
Big4	13905	0.0559	1.0000
State	13905	0.4567	1.0000

## 4.2 Multiple regression analysis

### 4.2.1 Environmental Pollution Control Investment and Enterprise Tax Avoidance

Hypothesis H1 believes that because local governments are affected by fiscal pressures, they will strengthen tax collection and management of enterprises, thereby inhibiting tax avoidance. Table 3 shows the multiple regression relationship between environmental pollution control investment and corporate tax avoidance. After adding related control variables, while controlling the year and industry dummy variables, the local government's investment in environmental pollution control and corporate tax avoidance showed the negative correlation at the 5% level. The results show that the amount of investment in environmental governance has increased, and corporate tax avoidance has decreased, the H1 hypothesis has been verified.

**Table2.** Result of basic regression

TA1	(1)
EnvInvest	-0.0058**
	(-2.042)
Constant	-0.0929*
	(-1.879)
Year	yes
Indcode	yes
N	13905
Adjust_R2	0.1095

Note: \*\*\*, \*\*, and \* indicate significance levels of 1%, 5%, and 10% (two-tailed) respectively; t-values are in parentheses, and standard errors are adjusted by clustering at the company level. The following tables are the same.

### 4.2.2 Mechanism

Table 3 uses mediation effect to test the mechanism of environmental pollution control investment and tax avoidance, the selected mediating variable is Egeft. According to the settings of model (2) and model (3), the following results are obtained. The results of column (1) obtained are consistent with the results in Table 2, and the column (2) shows the relationship between independent variable and mediating variable, it can be seen that the local government environmental pollution control investment and the government budget expenditure at the level of 1% are significant, showing a positive correlation. This shows that the local government is increasing environmental governance at the same time, the funds used for environmental governance and the construction of ecological infrastructure will form government expenditures, increasing budgetary expenditures and increasing financial pressure. Column (3) incorporates the independent variable and the mediating variable into the model for testing. It can be seen that the coefficients are both significant, so the mediation effect is established, that is, the government budget expenditure affects the local environment. The

intermediary variables of governance investment and corporate tax avoidance also support our logic.

**Table3.** Result of mediation effect

	TA1	Egft	TA1
	(1)	(2)	(3)
EnvInvest	-0.0058**	0.2686***	-0.0068**
	(-2.042)	(14.262)	(-2.406)
Egft			0.0026*
			(1.909)
Constant	-0.0929*	13.1054***	-0.1285**
	(-1.879)	(37.221)	(-2.434)
Year	yes	yes	yes
Indcode	yes	yes	yes
N	13905	13769	13769
Adjust_R2	0.1095	0.3298	0.1094

### 4.3 Robustness test

#### 4.3.1 Replace the dependent variable

In order to ensure the robustness of the results, we replace the indicators that measure the degree of corporate tax avoidance. In addition to the nominal interest rate minus the actual interest rate index (TA1) used in the previous article, this article also uses the company's actual tax rate (GAAP\_Etrs), the difference between the nominal interest rate and the actual interest rate calculated without considering deferred income tax (TA2), Accounting Tax Difference (BTD) and other indicators to measure the degree of tax avoidance of enterprises. It can be seen that there is a significant correlation between environmental pollution control investment and various indicators, which is consistent with the results of the main regression.

**Table4.** Robustness test

	GAAP_etr	TA2	BTD
	(1)	(2)	(3)
EnvInvest	0.0055*	-0.0053*	-0.0010*
	(1.898)	(-1.828)	(-1.942)
Constant	0.1643***	-0.1310**	-0.0241***
	(3.378)	(-2.562)	(-2.587)
Year	yes	yes	yes
Indcode	yes	yes	yes
N	13905	12556	13905
Adjust_R2	0.112	0.1099	0.0845

#### 4.3.2 Endogenous test

The previous results show that environmental pollution control investment is conducive to environmental governance and corporate tax avoidance. Conversely, the tax burden, as one of the important sources of local government fiscal revenue, will also affect local environmental

governance. Based on this logic, this paper adopts the instrumental variable method to alleviate the possible endogenous problems of mutual causality and missing variables. The article selects two instrumental variables. The first is the logarithmic treatment of the total population of each region (Population), and the second is the regional industrialization level (GDP\_industry), which is measured by the regional industrial GDP as a percentage of the regional GDP. The regression results of instrumental variables are shown in the following table. Columns (1) and (2) in the table are the results of the first stage regression. It can be seen that the coefficient of Population is 0.3806 and is significant at the 1% level, the coefficient of GDP\_industry is 0.6871, and it is also significant at the 1% level. The values of the F statistic are all greater than 10, indicating that there is no weak instrumental variable; columns (3) and (4) show the regression results of the second stage, it can be seen that the regression coefficient of EnvInvest is negative, which is consistent with the results of the main regression test, indicating that the results are still stable after considering the potential endogenous problems.

**Table5.** Result of IV test

	EnvInvest		TA1	
	First stage		Second stage	
	(1)	(2)	(3)	(4)
IV1=Population	0.3806*** (21.43)			
IV2=GDP_industry		0.6871*** (5.37)		
EnvInvest(IV1)			-0.0155** (-2.217)	
EnvInvest(IV2)				-0.0475* (-1.692)
Constant	1.0498*** (4.02)	4.1333*** (17.12)	-0.0474 (-0.884)	0.0954 (0.725)
Controls	yes	yes	yes	yes
Year	yes	yes	yes	yes
Indcode	yes	yes	yes	yes
F statistic	459.404	28.8812		
N(IV1)	13905		13905	
N(IV2)		13905		13905

## 5 Conclusions and Suggestions

This article uses data onto Shanghai and Shenzhen A-share listed companies as a sample from 2009 to 2017 to empirically test the impact of local governments' environmental governance behaviors on corporate tax avoidance. The results of the study found that there exist a significant negative correlation between the amount of investment in local environmental

governance and corporate tax avoidance, which shows that increasing the amount of investment in environmental governance of local government can effectively inhibit corporate tax avoidance. We have specifically examined the mechanism of action and found that local governments has invested more in environmental governance in the environmental governance process, which has increased budgetary expenditures within the government and further increased the financial pressure on local governments, thereby forcing the government to strengthen local taxation supervision, thereby inhibiting corporate tax avoidance.

Based on the research, the following suggestions are given. First, it is necessary to strengthen investment in environmental pollution control, optimize the investment structure of environmental pollution control, and make greater use of the role of such funds in environmental pollution control. Although China has reached the international standard, the overall utilization of funds is very low, showed the utilization of funds should be increased. Second, it is necessary to strengthen the coordination between local government environmental pollution control investment and corporate governance. Environmental pollution control investment will play a significant role in inhibiting corporate tax avoidance. Therefore, local governments should pay full attention to the overall effect of regional governance in this process and establish cross-regional pollution compensation mechanism to build a community of regional interest.

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