

# Tax Avoidance, Product Market Competition and Corporate Inefficient Investment

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**Abstract:** Corporate tax avoidance often aggravates the internal and external information asymmetry and agency conflict, and affects the future cash flow and thus the efficiency of corporate investment. Therefore, this paper selects all A-share listed companies from 2007 to 2020 as the research sample and empirically investigates the relationship between corporate tax avoidance and corporate inefficient investment based on the Richardson investment prediction model with product market competition as the moderator variable. The research results show that tax avoidance has a negative impact on corporate investment efficiency, i.e., the higher the degree of corporate tax avoidance, the lower the investment efficiency, and this negative impact is mainly manifested as tax avoidance triggers excessive investment. Further analysis reveals that product market competition effectively suppresses the negative impact of tax avoidance and ultimately optimizes the investment efficiency of companies. The findings of this paper enrich the research on tax avoidance from the perspectives of agent effect and capital effect, and also have important implications for companies and relevant tax collection and management departments.

## 1. Introduction

With the development of the new economic norm and the continuous improvement of tax collection and management laws, more and more corporate managers have started to adopt diversified tax avoidance measures to reduce their tax burden in order to increase corporate value. However, a large amount of existing literature finds that corporate tax avoidance behaviors do not necessarily bring value to companies. On the contrary, because the traditional tax avoidance theory ignores the fact of “separation of ownership and management” (Chen and Chu, 2005), when companies want to carry out tax avoidance activities, they will construct complex transactions to conceal their tax avoidance activities in order to prevent being discovered by tax authorities, which will slow down the flow of information and deepen the asymmetry. On the other hand, since tax avoidance increases the risk faced by managers, they may act against the interests of the firm for their own profit (Desai and Dharmapala, 2009) and have a tendency to misuse the surplus cash resources obtained from tax avoidance. The agency problem, information asymmetry and the uncertainty of cash flow are also the main factors affecting the efficiency of corporate investment, which provides new ideas for the study of the economic consequences of tax avoidance. In addition, this paper extends the research framework to the external governance mechanism of the firm - product market competition. On the one hand, the risk of mergers, liquidations and bankruptcies brought by product market competition force managers to make decisions that are consistent with shareholders' interests (Liu Zhiqiang, 2009), thus reducing agency costs. Product market competition also reduces information asymmetry by providing all shareholders of the firm with a benchmark against which to measure the firm's performance in the industry. On the other hand, increased product market competition compresses firms' profitability and makes it more difficult to raise capital, which facilitates the positive effect of tax avoidance savings. Then, does product market competition further influence the transmission mechanism of tax avoidance to inefficient investment by affecting information asymmetry, agency problems, and cash flows? This is the focus of research of this paper.

Most existing studies have explored the relationship between corporate tax avoidance and

investment efficiency (Liu Xing et al., 2013), but few have considered the external factor of product market competition. Therefore, this paper incorporates tax avoidance, product market competition and corporate inefficient investment into the same research system, which is innovative on the basis of previous studies, enriches the existing research on corporate tax avoidance, and has certain practical significance for government agencies to improve the tax collection and management system.

## 2. Literature Review

Investment, as an important means to add value to a firm and achieve sustainable development, has received considerable attention in academic world. Existing literature suggests that the degree of information asymmetry and agency problems are important factors affecting the efficiency of investment. From the perspective of information asymmetry theory, Jensen (1986) argues that due to the inconsistent information held by managers and shareholders, managers tend to put investment funds into projects that are not in line with shareholders' interests, resulting in overinvestment. Chen M et al. (2021) confirm that changes of the accounting standard can mitigate underinvestment by improving pricing distortions and adverse selection, and curb overinvestment by improving inadequate supervision and moral hazard. From the perspective of principal-agent theory, Wu Yingjun (2016) points out that in the context of separation of powers, divergent interests between shareholders and management caused by agency problems can affect investment efficiency. Few scholars also explore the factors affecting the efficiency of corporate investment from the free cash flow perspective. Jensen (1976) was the first to propose the free cash flow theory. Zhang Chen and Liu Yinguo (2015) pointed out that firms with more abundant free cash flow or lower cost of obtaining additional capital flows tend to overinvest.

The "principal-agency view of tax avoidance" points out that tax avoidance exacerbates principal-agent problems and information asymmetry. In terms of tax avoidance exacerbating agency problems, Chen and Chu (2005) argue that when companies engage in tax avoidance activities, agents face the risk of being detected and investigated, and due to the illegality of tax avoidance, salary contracts cannot compensate for this, which reduces the effectiveness of the contracts and exacerbates agency problems. In terms of information asymmetry exacerbated by tax avoidance, Desai (2006) argues that management can construct complex tax avoidance activities that cause information asymmetry, transfer corporate wealth to privately owned entities, and expropriate corporate wealth. Chen Beiguo et al. (2015) argue that tax avoidance activities not only increase information asymmetry within the firm, but also prevent outside investors from being informed of the accurate corporate information. Also, tax avoidance has certain capital effects, but are studied by few. Ji-Sun Park et al. (2020) studied the relationship between tax avoidance and the level of cash holdings and empirically concluded that tax avoidance affects cash holdings, and firms with higher levels of tax avoidance have lower cash holdings.

In terms of the impact of tax avoidance on corporate investment efficiency, the literature verifying tax avoidance and inefficient investment is relatively small, and only in recent years have domestic scholars used empirical methods to study the relationship between the two. Liu Xing et al. (2013) found that the degree of corporate tax avoidance significantly reduces the efficiency of corporate investment. Hu Xiao et al. (2017) find that tax avoidance can mitigate underinvestment in firms with high financing needs, but can exacerbate overinvestment by worsening agency problems. Many scholars have also considered the effects of factors internal and external to the firm on the relationship, such as executive salary (Chen Junliang. 2016), tax management (Zhang Ling. et al., 2015), and financing constraints (Ren Juahua et al., 2019). Few scholars have included product market competition in their research system, however, with the deepening of market-oriented reforms and economic development, investment and tax avoidance will be more susceptible to the influence of the external environment, especially the market environment (Liu Xing, 2018).

In summary, the existing literature on the mechanism of tax avoidance on investment efficiency focuses more on the agency effect of tax avoidance, and less on the capital effect. There is still a paucity of papers that put tax avoidance and investment efficiency in one framework, most of which only consider the internal and external governance factors of companies without considering the

moderating effect of product market competition on the mechanism of tax avoidance and inefficient investment. Therefore, based on principal-agent theory, information asymmetry theory and free cash flow theory, this paper takes tax avoidance as an entry point to study the impact of tax avoidance on corporate investment efficiency through two perspectives: agency effect and capital effect of tax avoidance, which is conducive to enriching the research results on the transmission path of tax avoidance on inefficient investment and deepening our understanding of the economic consequences of tax avoidance and the factors affecting investment efficiency. Finally, this paper introduces product market competition as a moderating variable to explore its moderating role in the relationship between the two, which is somewhat innovative.

### **3. Theoretical analysis and research hypothesis**

#### **3.1 Tax avoidance and inefficient investment**

This paper focuses on the relationship between tax avoidance and corporate inefficient investment from three aspects: information asymmetry, agency problem and free cash flow.

Firstly, corporate tax avoidance behavior will intensify the degree of internal and external information asymmetry. On the one hand, in order to achieve tax avoidance purposes, corporate managers will inevitably conceal tax avoidance facts and connected transaction behaviors from shareholders to minimize the risk of inspection and avoid the chance of investigation by tax authorities, which increases managers' opportunistic behaviors and exposes moral hazard: managers may pretend to implement tax avoidance activities, but actually use these activities to satisfy their own interests (Zhang Ling and Zhu Tingting, 2015), triggering a reduction in the efficiency of the conversion of outputs and inputs of corporate investment activities. On the other hand, company shareholders generally lack accounting, taxation, and financial expertise and are often in a disadvantageous position in terms of information, which leads to the ineffectiveness of their binding supervision on managers. The managers, as professionals, can manipulate the actual amount of tax payment by means of tax planning such as false income and false cost transfer because they are more familiar with and proficient in information about the operating conditions and market prospect of the company. Shareholders lack knowledge of the company's real operating conditions and are unable to effectively supervise the managers in the absence of information, which leads to a series of inefficient investments in the company.

Second, corporate tax avoidance can also exacerbate agency conflicts. Biddle et al. (2009) experimentally conclude that high compensation and incentives are rewarded by high managerial commitment, but when tax avoidance is introduced into the analytical framework, managers behave opportunistically as agents and thus they are less willing to put efforts into the growth of the firm's wealth. In the managerial entrenchment perspective, managers may focus on short-term NPV-positive investments for personal reasons (e.g., to maintain management power and prestige, to increase firm size, to obtain performance incentives, etc.) and ignore more profitable projects in the long run, resulting in short-sightedness and failure to promote the perpetual growth of the firm (Hope and Thomas, 2008). Alternatively, a few risk-averse managers may forgo using the proceeds of tax-averse activities for further investment even when faced with a profitable opportunity.

Finally, corporate tax avoidance also increases uncertainty about future cash flows. According to the free cash flow theory, when companies are threatened by financing constraints, professional managers are more inclined to channel their tax liabilities to negative NPV investment opportunities out of dissatisfaction with their current status or disapproval of their current income. This leads to irrational expansion of investment activities (Deng, Yuqing, 2020). Alternatively, managers may shift tax avoidance to projects that do not necessarily create shareholders' value to compensate for risk premiums like penalties. For example, they may use the excess free cash flow generated by tax avoidance activities to make capital expenditures or corporate acquisitions that are not necessarily in the interest of shareholders.

In summary, corporate tax avoidance acts on the investment efficiency of firms mainly through the above three paths. Accordingly, this paper intends to propose the Hypothesis 1.

H1: Other things being equal, there is a positive correlation between tax avoidance and corporate inefficient investment.

### **3.2 Tax avoidance, product market competition and corporate investment efficiency**

The three paths through which corporate tax avoidance acts on the efficiency of corporate investment have been described above, but their transmission paths are also vulnerable to the influence of the external environment. Therefore, this paper includes product market competition in the research framework, and its moderating mechanism on the relationship between the two can still be developed from the above three aspects. First, from the perspective of information asymmetry, market competition inevitably brings about comparisons, so that shareholders and other stakeholders within the firm can assess the effectiveness of the decision-making and the ability of the firm's managers through the performance of firms of the same level in the same industry, which to a certain extent restrains the self-interested behavior of managers and reduces the degree of information asymmetry within the firm (Nalebuff and Stiglitz 1983). For external investors, the additional information about the firm brought by fierce competitions can better drive them to find high-quality investment projects and allocate investment funds to target firms with good growth prospects, thus avoiding adverse selection and thus reducing the degree of information asymmetry within and outside the firm (Zhao, Chunxiang, 2013). Thus, it can be seen that firms with a higher degree of market competition can mitigate the problems of poor corporate information disclosure and internal and external information asymmetry brought about by tax avoidance, thus reducing the degree of inefficient investment.

Second, from the perspective of agency problems, in highly competitive industries, firms' profitability is compressed and they face more severe financial pressures and the risk of bankruptcy and liquidation. At this time, the probability of position rotation within the firm increases, and managers leave their jobs more frequently due to poor management than in industries with low competition (Defond and Park, 1999), forcing managers to work harder to preserve their careers. At the same time, increased competitions may also encourage shareholders and other stakeholders to strengthen the monitoring of managers' investment behavior and the consideration of investment effectiveness, and discourage their selfish and opportunistic behavior (Hu Xiao, 2017). Thus, it can be seen that product market competition can play a role in monitoring and motivating management, alleviating the agency problem caused by tax avoidance, and thus curbing the degree of inefficient investment.

Finally, from the perspective of investment cash flow, the fierce market competition has increased the financing constraints of companies and the difficulty of external financing, and companies are facing the problem of capital constraint. The supervisory effect of competition in the product market can greatly restrain managers from using these funds for excessive investment in "empire building" and play a positive role in tax avoidance.

In summary, product market competition can allow tax avoidance to play a positive role by alleviating information asymmetry, reducing agency problems, and monitoring the rational allocation of cash flows. Accordingly, this paper intends to propose the Hypothesis 2.

H2: Other things being equal, product market competition can weaken the positive correlation between tax avoidance and inefficient investment and improve firms' investment efficiency.

## **4. Study Design**

### **4.1 Sample selection and data sources**

In this paper, all A-share listed companies from 2007 to 2020 are selected as the research sample. Since a new corporate income tax was enacted in China in the year 2007, 2007 is taken as the initial year for data selection in this paper. The sample data underwent the following screening steps: (1) eliminating ST companies; (2) eliminating samples with missing and abnormal data; (3) eliminating financial companies and keeping only non-financial companies; (4) eliminating samples with income tax rate 0 or different income tax rate in the same year; (5) eliminating samples with negative taxable income; (6) eliminating samples with negative total assets or operating income. Based on the above

principles, the final 19647 data samples were obtained. In addition, in order to mitigate the impact of outliers, the continuous variables used in this paper are winsorized at the upper and lower 1% level in Stata software. All the data in this paper are obtained from the CSMAR database, and the sample data are processed using Stata15.

## 4.2 Variables Definition

### 4.2.1 Dependent variables

According to Richardson (2006), the following investment efficiency prediction model is constructed to estimate the inefficient investment of firms.

$$INV_{i,t} = \alpha_0 + \alpha_1 Growth_{i,t-1} + \alpha_2 Cash_{i,t-1} + \alpha_3 Age_{i,t-1} + \alpha_4 Size_{i,t-1} + \alpha_5 Return_{i,t-1} + \alpha_6 Invest_{i,t-1} + \Sigma Year_t + \Sigma Industry_j + \varepsilon_{i,t}, \quad (1)$$

where  $INV_{i,t}$  is the amount of the new capital investment in year  $t$ , and  $Growth_{i,t-1}$  is the growth rate of operating income in year  $t - 1$ .  $Cash_{i,t-1}$  is the cash assets in year  $t - 1$ .  $Age_{i,t-1}$  is the age of the firm in year  $t - 1$ .  $Return_{i,t-1}$  is the annual rate of return in year  $t-1$ .  $Invest_{i,t-1}$  is the new investment in year  $t-1$ , Year is the year dummy variable, and Industry is the industry dummy variable.  $INV_{i,t} = (\text{cash paid to build fixed assets, intangible assets and other long-term assets} + \text{M\&A expenditures} + \text{R\&D expenditures} - \text{cash recovered from the disposal of fixed assets, intangible assets and other long-term assets} - \text{replacement investment}) / \text{total assets at the beginning of the period}$ , with the following equation.

$$Invest_{i,t-1} = [CAPEX_{i,t} + Aquisition_{i,t} + RD_{i,t} - SalePPE_{i,t} - InvestMaintain_{i,t}] / A_{i,t-1} \quad (2)$$

Richardson (2006) states that the residual  $\varepsilon_{it}$  obtained in the regression model represents the unanticipated investment, so the absolute value of the residuals can be used to represent the degree of inefficient investment of the firm. The larger the absolute value of the residuals, the greater the level of inefficient investment, i.e., the less efficient the firm's investment. A positive residual is considered as overinvestment (O-invest) and a negative residual is considered as underinvestment (U-invest). In the main test, this paper investigates the overall level of inefficient investment, so the residuals are taken as absolute values as a proxy variable for the level of inefficient investment (Ininvest).

### 4.2.2 Independent variables

There are multiple methods for measuring the degree of tax avoidance in domestic and international studies, and the following two indicators are selected to measure the degree of tax avoidance in this paper, which are calculated as follows.

(1) Book-tax differences (BTD). The management in a company report internally the tax amount calculated based on book income, but when reporting externally, it will adjust the accounting profit according to the tax policy and finally pay tax based on the tax amount calculated from taxable income, thus the book-tax differences arise. Therefore, the degree of difference between the two reflects the degree of tax avoidance of the company: the larger the book-tax differences (BTD), the greater the degree of tax avoidance of the company.

The specific formula is as follows.

$$BTD = (\text{accounting profit before tax} - \text{taxable income}) / \text{total assets at the end of the period.}$$

$$\text{Taxable income} = (\text{income tax expense} - \text{deferred income tax expense}) / \text{nominal income tax rate}$$

(2) Book-tax differences net of the effect of accrued profits (DDBTD). BTD reflects the difference between normal accounting profit and taxable profit, but is also affected by corporate surplus management. Therefore, this paper used the book-tax differences after deducting the impact of accrued profits (DDBTD) to further measure the extent of corporate tax avoidance. This indicator, like BTD, can reflect the degree of subjective willingness of corporate tax avoidance activities. The specific formula is as follows.

$$BTD_{i,t} = \gamma TACC_{i,t} + u_{i,t} + \delta_{i,t} \quad (3)$$

$$DDBTD_{i,t} = u_{i,t} + \delta_{i,t} \quad (4)$$

where BTD represents book-tax differences, TACC is corporate accrued profit, and  $TACC = (\text{net profit} - \text{net cash flow from operating activities}) / \text{total assets}$ .  $u_{i,t}$  is the mean value of residuals within the sample period of the company, and  $\delta_{i,t}$  is the deviation of the residuals in year  $t$  from the mean value of residuals. DDBTD represents the part of BTD that cannot be explained by the accrued profit, and the higher the value, the greater the degree of tax avoidance of the company.

### 4.2.3 Moderator variables

In this paper, we propose to use product market competition as a moderator variable to better investigate the mechanism of tax avoidance on corporate inefficient investment. This paper follows the previous literature and uses the Lerner index as a measure. The Lerner index reflects the strength of monopoly power in the market by measuring the deviation of price from marginal cost. However, since marginal cost is more difficult to obtain, this paper replaces marginal cost with the average cost of the firm by referring to the method adopted by Liu Xiaohau et al. (2016) and Li Ziwei (2019), with the following formula.

$$Li_{i,t} = GPM_{i,t} - \sum_t^n (w_{i,t} \times GPM_{i,t}) \quad (5)$$

where  $Li$  denotes the Lerner index and  $GPM_{i,t}$  denotes the gross profit rate of company  $i$  in year  $t$ ,  $w_{i,t}$  denotes the proportion of operating revenue of company  $i$  in year  $t$  to the operating revenue of the whole industry, and  $n$  is the number of companies in the whole industry. From the viewpoint of competition, the more competitive the companies in the industry, the smaller the Lerner index should be. In order to be consistent with the direction of other indicators for measuring competition, this paper uses the opposite of Lerner index,  $Fli$ , to measure the degree of competition, i.e., the larger the  $Fli$ , the higher the degree of competition.

### 4.2.4 Control variables

For the reliability of the regression results, the following control variables are selected: free cash flow (Fcf): one of the consequences of the implementation of tax avoidance activities is to directly reduce the free cash flow outflow, while free cash flow is a necessary condition for investment activities, the size of the cash flow directly affects the investment amount, and even determines the efficiency of corporate investment. Firm size (Size): The larger the size of the company, the more tense its agency problems are. Since large-scale companies are the focus of attention of all sectors, so its information asymmetry will be reduced due to the supervision of all parties. In addition, the outside world trusts more in large-scale companies than other companies, so the larger the size of the company, the more likely to have more investment opportunities, which has an important impact on the efficiency of corporate investment. Leverage ratio (Lev): The higher leverage ratio indicates that companies increase the proportion of debt financing and expand the scale of creditors, which is not conducive to improving financing constraints and thus affects the investment efficiency of companies. Return on assets (Roa): generally speaking, the high level of profitability of a company means that the company is in benign development and its investment efficiency is positive. Corporate growth (Growth): according to the company life cycle theory, the growth of a company is positively related to the investment opportunities obtained, which is also one of the factors influencing the investment efficiency of a company. Company value (TQ): Tobin's  $q$  value. In this paper, we control the following corporate governance variables: the proportion of sole directors (Board) and the dual appointment of chairman and general manager (Dual); the nature of the company (Soe): compared with non-state-owned companies, state-owned companies are influenced by government constraints to a greater extent. On the one hand, state-owned companies are more abundant in funds and more likely to tend to overinvestment. In addition, year (Year) and industry (Industry) dummy variables are controlled in the model.

In summary, the variables are summarized in Table 1.

Table.1. Variable names and definitions

Variable Type	Variable Symbols	Variable Name	Variable Definition
Dependent variables	Ininvest	Inefficient Investments	The absolute value of residuals $\varepsilon_{i,t}$ in Model (1)
Independent variables	BTD	Book-tax differences accrued profits	The calculation method is shown in the Model (3)
	DDBTD	Book-tax differences net of the effect of accrued profits	The calculation method is shown in the Model (4)
Moderator variables	Fli	Opposite of Li index	Fli= -Li, the calculation of Li is shown in the Model (5)
Control variables	Fcf	Free cash flow	Net cash flow from operating activities
	Size	Company Size	ln(Total assets)
	Lev	Leverage ratio	Total liabilities/total assets at the end of the period
	Roa	Return on assets	Net profit/total assets
	Growth	Business growth	Sales revenue growth rate
	TQ	Company value	Tobin's q-value
	Broad	Percentage of sole directors	Directly from the CSMAR database
	Dual	The dual appointment of chairman and general manager	If the chairman and general manager are the same person, Dual is taken as 1, otherwise 0
	Soe	Company nature	If the company is state-owned, Soe is taken as 1, otherwise 0
	Year	Year dummy variables	
	Industry	Industry dummy variables	

### 4.3 Model Construction

#### 4.3.1 Tax avoidance and inefficient investment

To test the research Hypothesis 1, the model was constructed as follows.

$$Ininvest_{i,t} = \beta_0 + \beta_1 TA_{i,t} + \beta_2 Growth_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Roa_{i,t} + \beta_5 Size_{i,t} + \beta_6 TQ_{i,t} + \beta_7 Fcf_{i,t} + \beta_8 Board_{i,t} + \beta_9 Dual_{i,t} + \beta_{10} Soe_{i,t} + \Sigma Year_t + \Sigma Industry_j + \varepsilon_{i,t}, \quad (6)$$

where the sign and statistical significance of the coefficient  $\beta_1$  represent the direction and level of the impact of corporate tax avoidance on inefficient investment. If  $\beta_1$  is statistically significantly positive, it means that the degree of corporate tax avoidance is positively related to inefficient investment, i.e., the more frequently the firms implement tax outflow avoidance, the more irrational the utilization of corporate capital input and output is, and the research hypothesis is verified.

#### 4.3.2 Tax avoidance, product market competition and inefficient investment

To test the Hypothesis 2, Model (7) is constructed by adding the product market competition (Comp) and the interaction terms of tax avoidance and product market competition to Model (6) as follows.

$$Ininvest_{i,t} = \beta_0 + \beta_1 TA_{i,t} + \beta_2 Comp_{i,t} + \beta_3 TA_{i,t} \times Comp_{i,t} + \beta_4 Growth_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Roa_{i,t} + \beta_7 Size_{i,t} + \beta_8 TQ_{i,t} + \beta_9 Fcf_{i,t} + \beta_{10} Board_{i,t} + \beta_{11} Dual_{i,t} + \beta_{12} Soe_{i,t} + \Sigma Year_t + \Sigma Industry_j + \varepsilon_{i,t} \quad (7)$$

where *Comp* represents the degree of product market competition, and the opposite of the Lerner

index (Fli) is used as a proxy variable, and the terms in interaction are centered.

## 5. Empirical Analysis

### 5.1 Descriptive analysis

The mean value of inefficient investment (Ininvest) is 0.0404, indicating that the underutilization of capital input and output is still prevalent in China. However, the mean value of it in the study of Liu Xing and Ye Kangtao in the year 2013 is 0.05, compared with the data in this paper, indicating that the conversion efficiency of the investment activities gained and spent by listed companies in China has improved in the past few years. The mean value of overinvestment (O-invest) is 0.0584 and underinvestment (U-invest) is 0.050.0342, indicating that the irrational expansion of investment is somewhat more serious than the irrational contraction of investment for listed companies. Meanwhile, the standard deviations of inefficient investment (Ininvest), overinvestment (O-invest), and underinvestment (U-invest) are 0.0422, 0.0826, and 0.0308 respectively, indicating that the utilization rate of resources per unit of company varies widely. The range of Fli is from -0.842 to 7.421, which shows that there are large differences in the product competitive pressure of companies in the industry.

Table.2. Descriptive analysis

Variables	Observations	Average	Minimum Value	Median	Maximum Value	Standard Deviation
Ininvest	19647	0.0404	0.000543	0.0279	0.284	0.0422
O invest	7455	0.0584	3.47e-06	0.0309	0.964	0.0826
U invest	12192	0.0342	3.01e-06	0.0269	0.321	0.0308
BTD	19647	-0.000418	-0.0749	-0.00176	0.0993	0.0239
DDBTD	19647	-0.00111	-0.0866	-0.00175	0.0931	0.0243
Fli	19647	-0.134	-0.842	-0.113	7.421	0.131
Board	19647	0.372	0.308	0.333	0.571	0.0507
Dual	19647	0.220	0	0	1	0.414
Lev	19647	0.439	0.0590	0.439	0.857	0.192
Roa	19647	0.0523	0.00152	0.0427	0.222	0.0405
Soe	19647	0.458	0	0	1	0.498
TQ	19647	1.962	0.875	1.616	7.730	1.061
Fcf	19647	5.945e+08	-2.327e+09	1.628e+08	1.814e+10	1.629e+09
Growth	19647	0.189	-0.439	0.128	2.822	0.327
Size	19647	22.26	20.00	22.09	26.25	1.205

### 5.2 Correlation Analysis

The results of the correlation tests for some of the variables are presented in the Table 3. It can be seen that the correlation coefficients of book-tax differences (BTD) and inefficient investment are 0.0482 and DDBTD and inefficient investment are 0.0237, and both are quite significant, which tentatively verifies that the implementation of corporate tax avoidance may lead to a reduction in the investment efficiency. Product market competition (Fli) is statistically significantly and negatively correlated with inefficient investment (Ininvest) at the 1% level, which can tentatively reflect that the increase of product market competition can mitigate the level of inefficient investment. The maximum value of correlation coefficient between the variables is 0.445 and none of them exceeds 0.65, which can be tentatively judged that there is no serious problem of multicollinearity.



Table.3. Correlation analysis for main variables

	Ininvest	BTD	DDBTD	Fli	Board	Dual	Lev	Roa	Soe
Ininvest	1								
BTD	0.0482***	1							
DDBTD	0.0237**	0.8033***	1						
Fli	0.0323***	0.0357***	-0.0357**	1					
Board	0.0062	0.0051	0.0138	-0.016**	1				
Dual	0.0450***	0.0123	0.00300	0.043***	0.1102***	1			
Lev	0.0640***	0.1458***	0.1156***	0.136***	-0.0115	0.1242***	1		
Roa	0.1048***	0.2845***	0.2112***	0.445***	-0.0160**	0.0548***	0.3718**	1	
Soe	0.0944***	-0.0125	0.00730	0.076***	0.0685***	0.2802***	0.2676***	0.1477***	1

Note: \*\*\*, \*\*, and \* indicate significant levels at the 1%, 5 %, and 10%, respectively.

### 5.3 Empirical test results

#### 5.3.1 The impact of tax avoidance on inefficient investment

Table 4 reports the regression results of Model (6). The results show that the regression coefficients of book-tax differences (BTD) and book-tax differences net of the effect of accrued profits (DDBTD) are 0.0683 and 0.0393, both significantly positive. This shows that corporate tax avoidance is significantly and positively related to inefficient investment, indicating that corporate tax avoidance exacerbates the decline of corporate efficiency, which verifies Hypothesis 1. In addition, the regression coefficients of other control variables are mostly significant, among which free cash flow (Fcf) is significantly and positively related to inefficient investment at the 1% and 5% levels, which is consistent with the previous theory.

Table.4. Regression results of tax avoidance and inefficient investment

Variables	Inefficient investment (Ininvest)	
	(1)	(2)
BTD	0.0683*** (3.57)	
DDBTD		0.0393** (2.12)
Board	-0.0076 (-0.89)	-0.0119 (-1.38)
Dual	0.0032*** (2.99)	0.0035*** (3.23)
Lev	0.0069** (2.11)	0.0068** (2.06)
Roa	0.0213 (1.56)	0.0349** (2.57)
Soe	-0.0085*** (-8.38)	-0.0088*** (-8.67)
TQ	0.0015*** (2.66)	0.0016*** (2.78)
Fcf	0.0014*** (2.75)	0.0025** (2.50)
Growth	0.0227*** (16.37)	0.0212*** (15.08)
Size	-0.0020*** (-3.45)	-0.0017*** (-2.86)
_cons	0.0878*** (6.37)	0.0848*** (6.09)
N	19647	19647

r2_a	0.0776	0.0766
F	19.5190	18.7452
p	0.0000	0.0000

Note: \*\*\*, \*\*, \* indicate significant levels at 1%, 5%, and 10%, respectively; values in parentheses are t-values, same as in the latter tables, without interpretation.

### 5.3.2 The impact of product market competition on tax avoidance and inefficient investment

The regression results for Model (7) are reported in Table 5. Among them, the regression coefficients of both BTD and DDBTD are significant, which is consistent with Hypothesis 1. The coefficient of the interaction term of book-tax difference (BTD) and product market competition (Fli) is -0.5537 and significant at the 5% level; the coefficient of the interaction terms of DDBTD and product market competition (Fli) is -0.1162 and significant at the 10% level. This shows that the moderator effect of product market competition is significant and can reduce the negative impact of tax avoidance on investment efficiency, which verifies Hypothesis 2.

Table.5. Regression results of product market competition on tax avoidance and inefficient investment

Variables	Inefficient investment (Ininvest)	
	(1)	(2)
BTD	0.0546*** (2.64)	
DDBTD		0.0301** (2.51)
Fli	-0.0215*** (-4.62)	-0.0192*** (-4.16)
BTD × Fli	-0.5537** (-2.26)	
DDBTD × Fli		-0.1162* (-0.48)
Growth	0.0193*** (18.54)	0.0186*** (18.09)
Lev	0.0032 (1.39)	0.0037 (1.59)
Roa	0.0042 (0.38)	0.0113 (1.02)
Size	-0.0012*** (-2.70)	-0.0011** (-2.55)
TQ	0.0015*** (3.74)	0.0015*** (3.75)
Fcf	0.0000 (1.43)	0.0000 (1.37)
Soe	-0.0077*** (-10.20)	-0.0077*** (-10.26)
Dual	0.0024*** (3.02)	0.0023*** (2.94)
Board	0.0067 (1.06)	0.0056 (0.88)
_cons	0.0565*** (5.42)	0.0552*** (5.30)
N	1.7e+04	1.7e+04
r2_a	0.0762	0.0753
F	14.8565	14.6776
p	0.0000	0.0000

## 6. Robustness tests

### 6.1 Robustness tests of Hypothesis 1

#### 6.1.1 On period lagged

In the main test, this paper has used two proxy variables to measure tax avoidance, and the regression results have some robustness. However, some scholars point out that the impact of tax avoidance will not be immediate in the current period, but may be lagged in that the executives may adjust their strategies to avoid tax loss according to the business operation, national policy changes and macroeconomic environment in the previous period. Therefore, two proxy variables selected in this paper to measure the degree of tax avoidance are lagged by one period, and the study is again tested separately for robustness. Columns (1) and (2) of Table 6 report the regression results of the one-period lagged robustness test. The regression coefficients of book-tax differences lagged one period (IBTD) and book0tax differences net of the effect of accrued profits lagged one period (IDDBTD) are both significantly positive, and both results remain consistent with those in the main test. Therefore, the test results can be proved to be robust.

Table.6. Robustness test of Hypothesis 1

Variables	Inefficient investment (Ininvest)				
	(1)	(2)	(3)	(4)	(5)
IBTD	0.0575*** (2.75)				
IDDBTD		0.0491** (2.45)			
BTD			0.0595*** (2.86)		
DDBTD				0.0406** (2.02)	
RATE_diff					0.0069* (1.96)
Board	-0.0121 (-1.28)	-0.0107 (-1.14)	-0.0032 (-0.36)	-0.0076 (-0.83)	-0.0076 (-0.83)
Dual	0.0023* (1.89)	0.0024** (1.98)	0.0029*** (2.60)	0.0033*** (2.92)	0.0033*** (2.92)
Lev	0.0078** (2.12)	0.0084** (2.31)	0.0064* (1.83)	0.0063* (1.79)	0.0063* (1.79)
Roa	0.0264* (1.74)	0.0294** (1.96)	0.0104 (0.71)	0.0242* (1.66)	0.0242* (1.66)
Soe	-0.0079*** (-7.30)	-0.0080*** (-7.38)	-0.0093*** (-8.60)	-0.0098*** (-8.95)	-0.0098*** (-8.95)
TQ	0.0022*** (3.37)	0.0022*** (3.48)	0.0012* (1.95)	0.0013** (2.05)	0.0013** (2.05)
Fcf	0.0000** (2.32)	0.0000** (2.29)	0.0000*** (3.35)	0.0000*** (3.08)	0.0000*** (3.08)
Growth	0.0189*** (10.85)	0.0182*** (10.51)	0.0247*** (16.63)	0.0232*** (15.40)	0.0232*** (15.40)
Size	-0.0011 (-1.58)	-0.0011 (-1.60)	-0.0026*** (-4.08)	-0.0022*** (-3.48)	-0.0022*** (-3.48)
_cons	0.0761*** (4.79)	0.0741*** (4.70)	0.1018*** (6.68)	0.0992*** (6.45)	0.0992*** (6.45)
N	6.7e+03	6.7e+03	7.9e+03	7.6e+03	7.6e+03
r2_a	0.0697	0.0692	0.0866	0.0865	0.0865
F	13.2575	13.1587	20.6631	19.9798	19.9798
p	0.0000	0.0000	0.0000	0.0000	0.0000

### 6.1.2 Adjustment of sample interval

China started to implement new accounting standards in 2007 and new corporate income tax law in 2008. This will result in the calculation of tax avoidance indicators being affected by institutional changes. In order to exclude the possible influence of institutional change on the findings of this paper, we exclude the sample in year 2007~2010 and re-run the empirical tests for the new sample. The regression results reported in Columns (3) and (4) of Table 6 show that the regression coefficients of book-tax differences (BTD) and book-tax differences net of the effect of accrued profits (DDBTD) and inefficient investment (Ininvest) are significantly positive, which remains consistent with the results in the main test. Therefore, the test results can be proved to be robust.

### 6.1.3 Substitution of independent variables

This paper uses the nominal income tax rate minus the effective income tax rate to measure the degree of corporate tax avoidance, i.e., RATE\_diff. It replaces the original measurement of the degree of corporate tax avoidance, as shown in the results in Column (5) of Table 6, the results of the RATE\_diff and Ininvest regressions are significantly positive at the 10% level, and the reported regression results show consistency with the results in the main test. Therefore, the test results can be shown to be robust.

## 6.2 Robustness Test of Hypothesis 2

### 6.2.1 One period lagged

After lagging the two proxy variables by one period in Columns (1) and (2) of Table 7, the following results are obtained: the coefficient of the interaction term of lagged book-tax differences (IBTD) and product market competition (Fli) is -0.2029 and is significant at the 10% level; the coefficient of the interaction term of the lagged book-tax differences net of the effect of accrued profits (IDDBTD) and product market competition (Fli) is -0.2138 and is significant at the 10% level. This shows that the moderator effect of product market competition remains significant and is consistent with the results in the main test. Therefore, the test results can be proved to be robust.

Table.7. Robustness test of Hypothesis 2

Variables	Inefficient investment (Ininvest)				
	(1)	(2)	(3)	(4)	(5)
IBTD	0.0647* (1.87)				
IDDBTD		0.0314** (2.14)			
Fli	-0.0167*** (-3.32)	-0.0187*** (-3.72)			-0.0186*** (-4.15)
IBTD × Fli	-0.2029* (0.91)				
IDDBTD × Fli		-0.2138* (0.97)			
BTD			0.0629** (2.10)		
DDBTD				0.0312** (2.30)	
Fhhi			-0.0171** (-2.22)	-0.0165** (-2.12)	
BTD × Fhhi			-0.6879* (-1.82)		
DDBTD × Fhhi				-0.3536* (-1.12)	
RATE_diff					-0.0020* (-0.47)
RATE_diff × Fli					-0.1042*** (-3.03)

Board	0.0047 (0.66)	0.0056 (0.80)	0.0193* (1.88)	0.0215** (2.10)	0.0065 (1.04)
Dual	0.0022** (2.42)	0.0021** (2.35)	0.0017 (1.52)	0.0016 (1.46)	0.0023*** (2.90)
Lev	0.0038 (1.42)	0.0041 (1.55)	0.0102** (2.55)	0.0115*** (2.88)	0.0039* (1.67)
Roa	0.0127 (1.04)	0.0123 (1.02)	0.0112 (0.71)	0.0199 (1.27)	0.0103 (0.94)
Soe	-0.0074*** (-8.94)	-0.0073*** (-8.90)	-0.0051*** (-3.02)	-0.0050*** (-2.98)	-0.0079*** (-10.54)
TQ	0.0017*** (3.84)	0.0016*** (3.60)	0.0024*** (3.69)	0.0023*** (3.52)	0.0014*** (3.60)
Fcf	0.0000 (0.76)	0.0000 (0.76)	-0.0000 (-0.29)	-0.0000 (-0.18)	0.0000 (1.43)
Growth	0.0181*** (14.92)	0.0177*** (14.65)	0.0303*** (15.69)	0.0293*** (15.20)	0.0190*** (18.81)
Size	-0.0004 (-0.89)	-0.0005 (-1.11)	-0.0008 (-0.94)	-0.0007 (-0.87)	-0.0013*** (-3.07)
_cons	0.0362*** (3.01)	0.0414*** (3.53)	0.0560** (2.40)	0.0548** (2.35)	0.0593*** (5.73)
N	1.3e+04	1.3e+04	6.9e+03	6.8e+03	1.7e+04
r2_a	0.0796	0.0801	0.0804	0.0816	0.0769
F	12.5964	12.7019	7.9757	8.0666	15.3544
p	0.0000	0.0000	0.0000	0.0000	0.0000

## 6.2.2 Substitution of moderator variables

The Lerner coefficient used in the previous paper as a proxy variable for product market competition is mainly used to measure the intensity of inter-firm market competition within an industry, while the degree of inter-industry market competition should also be taken into account. Referring to the approach of Jiang Fuxiu et al. (2009), this paper uses the Herfindahl-Hirschman Index (HHI) to measure the degree of inter-industry competition instead of the Lerner index. Since the greater the HHI index, the higher the industry concentration and the lower the industry competition, this paper adopts the opposite of the Herfindahl-hirschman index, Fhhi, to replace Fli as a proxy variable for product market competition; the greater the Fhhi, the more intense the competition is.

The results in Columns (3) and (4) of Table 7 show that the coefficient of the interaction term for book-tax differences (BTD) and product market competition (Fhhi) is -0.6879 and is significant at the 10% level; the coefficient of the interaction term of book-tax differences net of the effect of accrued profits (DDBTD) and product market competition (Fhhi) is -0.3536 and is significant at the 10% level. This shows that the moderator effect of product market competition remains significant and is consistent with the results in the main test. Therefore, the test results can be proved to be robust.

## 6.2.3 Substitution of independent variables

Column (5) of Table 7 also uses RATE\_diff to replace the original measurement of the degree of corporate tax avoidance, and the results show that the coefficient of the interaction term of RATE\_diff and product market competition (Fli) is -0.1042 and is significant at the 1% level, and the moderator effect of product market competition remains significant, consistent with the results in the main test. Therefore, the test results can be proved to be robust.

## 7. Further analysis

### 7.1 Distinguish between overinvestment and underinvestment

In the previous paper, the overall level of inefficient investment (Ininvest) is used as the dependent variable for the correlation test, and no specific analysis is developed by dividing overinvestment or underinvestment. Therefore, the specific impact of corporate tax avoidance on the two types of inefficient investment needs to be further discussed. This paper proposes to extend the study by

dividing the sample into two groups: the overinvestment group (O-invest), and the underinvestment group (U-invest), which are separately substituted for inefficient investment (Ininvest) as the dependent variable in the regression of subsamples.

Table.8. Test distinguishing between overinvestment and underinvestment

Variables	(1)	(2)	(3)	(4)
	O invest	O invest	U invest	U invest
BTD	0.1439*** (2.94)		0.0136 (0.74)	
DDBTD		0.0405* (0.87)		0.0119 (0.66)
Board	-0.0383* (-1.79)	-0.0419* (-1.93)	-0.0016 (-0.19)	-0.0034 (-0.40)
Dual	0.0032 (1.17)	0.0036 (1.30)	0.0001 (0.08)	-0.0002 (-0.16)
Lev	0.0043 (0.49)	0.0035 (0.40)	-0.0090*** (-2.92)	-0.0093*** (-2.99)
Roa	-0.0793** (-2.18)	-0.0389 (-1.08)	0.0120 (0.93)	0.0185 (1.43)
Soe	-0.0156*** (-5.96)	-0.0159*** (-6.01)	-0.0050*** (-5.24)	-0.0052*** (-5.40)
TQ	0.0033** (2.01)	0.0028* (1.73)	0.0011** (2.20)	0.0012** (2.23)
Fcf	0.0000 (0.76)	0.0000 (0.62)	0.0000** (2.23)	0.0000** (2.12)
Growth	0.0501*** (15.42)	0.0488*** (14.61)	0.0118*** (8.44)	0.0115*** (8.15)
Size	0.0003 (0.22)	0.0009 (0.59)	-0.0024*** (-4.36)	-0.0023*** (-4.00)
_cons	0.0602* (1.69)	0.0577 (1.59)	0.1013*** (7.73)	0.0989*** (7.44)
N	4.0e+03	3.9e+03	5.4e+03	5.3e+03
r2_a	0.1088	0.1054	0.0781	0.0801
F	12.5734	11.8492	12.1977	12.1844
p	0.0000	0.0000	0.0000	0.0000

Table 8 reports the regression results of the study after distinguishing between the two types of inefficient investments. Among them, it can be seen from the first 2 columns that the coefficients of the two proxy variables for tax avoidance (BTD and DDBTD) are significantly positive in the overinvestment group, with 0.1439 and 0.0405 respectively. From the results in the next 2 columns, it can be obtained that the coefficients of the tax avoidance proxy variables are positive but not significant in the underinvestment group, thus proving that the implementation of actions by firms to hinder tax outflow mainly leads to an irrational expansion of corporate investment. The possible reason is that the activity of tax avoidance brings explicit tax saving benefits, and the corporate executives' desire to control this benefit is more inflated, and they are more inclined to use this production material to expand the scale of investment and increase their control and possession of corporate wealth instead of distributing it to shareholders, leading to corporate overinvestment.

## 8. Conclusions and Recommendations

### 8.1 Research conclusion

This paper investigates the relationship between corporate tax avoidance, product market competition and inefficient investment, and finds that: first, corporate tax avoidance exacerbates information asymmetry, agency conflict and cash flow uncertainty, which in turn leads to inefficient corporate investment. Second, product market competition can effectively mitigate the positive relationship between corporate tax avoidance and inefficient investment. Third, further analysis finds that corporate behaviors that hinder tax outflow mainly leads to irrational expansion of investment.

## 8.2 Policy recommendations

Based on the findings, this paper makes the following recommendations: First, for companies, they should promote the establishment of internal governance mechanisms as well as shareholder monitoring mechanisms to effectively monitor and discipline management so that tax avoidance can play a beneficial role. Secondly, companies should also strengthen free cash flow management and develop cash flow management methods that are suitable for their own situation and the external market, which are important for preventing and avoiding inefficient investment and improving the efficiency of corporate investment. Finally, companies should always pay attention to the degree of competition the market they in and actively adjust their financial decisions to adapt to the uncertainty brought about by external market competition.

Secondly, for tax authorities, they should realize that if companies want to manipulate the amount of tax payment, their behavior must be quite hidden and complicated, so authorities need to strengthen the training and continuing education of tax personnel and give full play to the external supervision role of tax administration department. What's more, since the laws, regulations and systems related to taxation are not perfect, so it is necessary to fill in the loopholes of the tax law system, continuously improve the transparency of market competition environment, and help companies to develop benignly.

Thirdly, for the government, first, it needs to encourage the influx of funds from all parties to the market, relax the conditions of investment institutions, build financing platforms for companies facing financing constraints, improve the state of corporate investment and financing, and avoid tax evasion by companies to relieve capital pressure. Second, the government can also actively promote market-oriented reforms and establish a reasonable market competition mechanism to promote the prosperous development of our economy.

## References

- [1] Chen K P, Chu C Y C. Internal Control vs. External Manipulation: A Model of Corporate Income Tax Evasion[J]. *Social Science Electronic Publishing*, 2005, 36(01):151-164.
- [2] Desai, M., & Dharmapala, D. Corporate tax avoidance and firm value[J]. *The Review of Economics and Statistics*, 2009, 91(03):537-546.
- [3] Liu Zhiqiang., Yu Minggui. A review of research on the governance mechanism of product market competition [J]. *Journal of Yunnan University of Finance and Economics*, 2009, 25(02): 11-16.
- [4] Liu Xing, Ye Kangtao. Do firms' tax avoidance activities affect investment efficiency? [J]. *Accounting Research*, 2013(06): 47-53+96.
- [5] Jensen,M.C. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review*, 1986, 76(02):323-29.
- [6] Chen Ming, Gu Shuibing. A study on the effect of accounting standard changes on the governance of inefficient investment - based on the perspective of adverse selection and moral hazard [J]. *Audit and Economic Research*, 2017, 32(03): 58-67.
- [7] Wu Yingjun. The impact of managerial agency on investment efficiency--a study based on Chinese listed family firms[J]. *Contemporary Economic Science*, 2016, 38(03): 91-105+127.
- [8] Jensen,M.C., Meckling,W.H. Theory of the firm: Managerial behavior, agency costs and ownership structure[J]. *Journal of financial economics*, 1976, 3(04): 305-36.
- [9] Zhang Chen, Liu Yinguo. Accounting robustness and agency costs of free cash flow: An examination based on firms' investment behavior[J]. *Journal of Management Engineering*, 2015, 29(01): 98-105.
- [10] Desai, M., & Dharmapala, D. Corporate tax avoidance and high-powered incentives[J]. *Journal of Financial Economics*, 2006, 79(01):145-179.
- [11] Chen Beiguo, Yang Xiaolan. An empirical analysis of the impact of corporate tax avoidance

- activities on investment efficiency[J]. *Finance and Accounting Monthly*. 2015(12): 38-40.
- [12] Ji-Sun Park, Zhang Xuanman. Tax avoidance, executive incentives and cash holdings [J]. *Journal of Yanbian University (Social Science Edition)*. 2020, 53(03): 123-130+144.
- [13] Hu Xiao, Liu Bing, Jiang Shuiquan. Product market competition, tax avoidance and capital investment-an empirical investigation based on the perspective of capital pressure and agency costs [J]. *Economic Review*. 2017(01): 90-105.
- [14] Chen Junling. A study on the relationship between executive compensation, corporate tax avoidance and overinvestment [J]. *Business*, 2016, (08):4.
- [15] Zhang L, Zhu T. Tax collection, corporate tax avoidance and corporate investment efficiency [J]. *Audit and Economic Research*. 2015, 30(02): 83-92.
- [16] Ren, Jiahua, Guo, Hui. Venture capital, financing constraints and tax avoidance[J]. *Finance and Accounting Monthly*, 2019(22):142-151.
- [17] Liu Xing, Lv Changjiang. Strategic effects of corporate tax avoidance--a study based on the impact of tax avoidance on corporate product market performance[J]. *Financial Research*. 2018(07):158-173.
- [18] Biddle, G., G. Hilary, R. S. Verdi. How does Financial Reporting Quality Relate to Investments Efficiency? [J], *Journal of Accounting and Economics*, 2009, 48(02-03):112-131.
- [19] Hope, O. and W. Thomas. Managerial Empire Building and Firm Disclosure[J], *Journal of Accounting Research*, 2008, 46(03): 591–626.
- [20] Deng Yuqing. Tax avoidance and investment efficiency: mediating effects based on future cash flows[J]. *Public Economics and Policy Studies*. 2020(00).
- [21] Nalebuff B J, Stiglitz J E. Information, Competition, and Markets[J]. *The American Economic Review*, 1983, 73(02): 278-283.
- [22] Zhao Chunxiang, Zhang Dunli. A study on the relationship between managerial power and corporate investment from the perspective of market competition[J]. *Accounting Research*, 2013(10):67-74+97.
- [23] DeFond, M. L., C. W. Park. The Effect of Competition on CEO Turnover[J]. *Journal of Accounting and Economics*, 1999, 27(01):35-56.
- [24] Sun Ye, Xu Yan. Research on the relationship between product market competition and financing constraints - the mediating role based on the background characteristics of board members[J]. *Industrial Economics Research*, 2016(01):100-110.
- [25] Richardson,S. Over - investment of Free Cash Flow[J]. *Review of Accounting Studies*, 2006, 11(2-3): 159-189.
- [26] Liu Xiaohua, Zhang Lihong. Product market competition, accounting information quality and investment efficiency - empirical evidence from China's A-share market, 2001-2014 [J]. *Journal of Central University of Finance and Economics*. 2016(09): 57-72.
- [27] Li Ziwei. Tax avoidance, product market competition and inefficient investment[D]. Beijing Jiaotong University. 2019.
- [28] Jiang Fuxiu, Huang Lei, Zhang Min. Product market competition, corporate governance, and agency costs[J]. *World Economy*. 2009, 32(10): 46-59.