



# Research on the Influence of Accounting Conservatism on Enterprise Innovation

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**Abstract.** This paper takes China's A-share non-financial listed companies from 2011 to 2021 as research samples to explore the impact of accounting conservatism on enterprise innovation, studies the impact of property rights nature on the relationship between accounting conservatism and enterprise innovation. The results show that the improvement of accounting conservatism will restrain the level of innovation input and innovation output. Compared with state-owned enterprises, accounting conservatism has a more significant inhibitory effect on innovation input and output in non-state-owned enterprises.

**Keywords:** Accounting conservatism · Enterprise innovation · Nature of property rights

## 1 Introduction

Accounting conservatism is one of the important quality characteristics of accounting information, which has a continuous and far-reaching influence on the management decision and operation behavior of enterprises. Basu (1997) proposed that the essence of conservatism is the asymmetry of the response of accounting earnings to “good news” and “bad news” [1].

In order to realize the sustainable development of enterprises, enterprises need to carry out technological innovation activities, and the effective implementation of corporate governance is an important institutional guarantee for technological innovation. On the one hand, the governance mode of accounting conservatism can effectively alleviate the principal-agent problem, and the principal can timely adjust the company's operating policies according to the accurately measured financial statement information, so as to promote the long-term sustainable development of enterprise operating profits (Yang Chengqi, 2021) [2]. On the other hand, some researchers believe that in order to ensure their own accounting conservatism, enterprise managers usually have a risk aversion bias, so that enterprises will reduce the investment in technological innovation (Tuling, 2021) [3]. Therefore, this paper selects Chinese A-share listed companies in non-financial industry from 2011 to 2021 as the research object. This paper empirically tests the influence of accounting conservatism on the relationship between innovation input and innovation output of enterprises, and further analyzes the influence of property rights on the relationship between them.

## 2 Theoretical Analysis and Research Hypothesis

### 2.1 The Influence of Accounting Conservatism on Enterprise Innovation

Accounting conservatism is a prudent response to the uncertainty of the economic environment. Ahmed et al. (2002) showed that sound accounting policies can alleviate the information asymmetry between shareholders and creditors, and reduce the conflict of interest between shareholders and creditors [4]. Scholars Du Xiorong et al. (2018) found accounting conservatism has greatly increased the pursuit of short-term performance by corporate management. In turn, the management will reduce the innovation investment with high risk and strong uncertainty to obtain more returns [5].

Enterprise innovation activities have the characteristics of long term, high risk and difficult to predict. Once the investment of innovation projects fails, accounting conservatism requires that the loss be reflected in accounting earnings in time. The managers of enterprises will bear the responsibility for the investment loss themselves. Chang et al. (2015) showed that the number of patents and R&D activities of enterprises with high accounting conservatism will decrease [6]. Laux and Ray (2016) believed that managers will avoid projects with high investment risks, in order to reduce the risks in office, thus inhibiting the performance of enterprise innovation activities [7]. Based on the above analysis, this paper proposes the following hypotheses:

**H1a:** Accounting conservatism is negatively correlated with corporate innovation investment, that is, accounting conservatism will inhibit corporate innovation investment.

**H1b:** Accounting conservatism is negatively correlated with enterprise innovation output, that is, accounting conservatism will inhibit enterprise innovation output.

### 2.2 The Impact of the Nature of Property Rights on Accounting Conservatism and Enterprise Innovation

The principle of accounting conservatism makes the characteristics of enterprise innovation with high risks and lagging returns have a negative impact on the current management. The existence of soft budget constraints makes state-owned enterprises face less financing constraints, and the government will support state-owned enterprises by increasing investment, financial subsidies and loans, and reducing tax burden [8]. The competitive advantage of state-owned enterprises is the special resources or licenses obtained based on identity. The realization of these goals requires managers to pay more attention to the long-term development of the enterprise, so the corresponding research and development demand is low. For non-state-owned enterprises, the industry competition is fierce, and they need to carry out innovative activities to seize the market, in order to achieve long-term development. Based on the above analysis, this paper proposes the following hypotheses:

**H2a:** The inhibitory effect of accounting conservatism on enterprise innovation investment is more significant in non-state-owned enterprises.

**H2b:** The inhibitory effect of accounting conservatism on enterprise innovation output is more significant in non-state-owned enterprises.

### 3 Research Design

#### 3.1 Sample Selection and Data Sources

A-share listed companies from 2011 to 2021 are taken as the initial samples. The initial samples are screened according to the following criteria: ST, \*ST and PT companies are excluded; excluding firms in the financial sector; and exclude missing samples. In order to eliminate the influence of extreme outliers, this paper winsorizes the continuous variables at the 1%–99% quantile.

#### 3.2 Definition of Variables

##### Explained variable.

The explained variable in this paper is corporate innovation. The innovation input refers to the treatment method of He and Wintoki (2016), and the logarithm (RD) of the total RD expenditure is standardized [9]. The innovation output refers to the research of Zhu et al. (2018) on enterprise innovation, and the logarithm of the number of patent applications plus 1 (InventionG) is standardized [10].

##### Explanatory variables.

The explanatory variable in this paper is accounting conservatism, which adopts the Khan-Watts model (Khan and Watts, 2009) [11].

##### Control variables.

Referring to the previous relevant research results, the following control variables are selected: enterprise size, return on equity, growth, asset-liability ratio, market competition degree, Shareholding ratio of the largest shareholder and the operating level of listed companies. Finally, a dummy variable of year is introduced to control the impact.

#### 3.3 Model Building

This paper adopts the panel fixed effect model for testing, and adds the annual dummy variable (Year) to the model to control the time fixed effect.

$$\text{Invention}_{i,t} = \beta_0 + \beta_1 C - \text{Score}_{i,t} + \gamma \text{Control}_{i,t} + \sum \text{Year} + \varepsilon_{i,t} \quad (1)$$

Referring to the research of He and Wintoki (2016) and other scholars, this paper uses the logarithm of the total development expenditure (RD) as the indicator of innovation input to conduct the main regression, then Model (5) can be expressed as:

$$\text{RD}_{i,t} = \beta_0 + \beta_1 C - \text{Score}_{i,t} + \gamma \text{Control}_{i,t} + \sum \text{Year} + \varepsilon_{i,t} \quad (2)$$

Referring to the research of Zhu et al. (2018) on corporate innovation, this paper uses the number of patent applications to test the innovation output of enterprises. Then Model (5) can be expressed as:

$$\text{InventionG}_{i,t} = \beta_0 + \beta_1 C - \text{Score}_{i,t} + \gamma \text{Control}_{i,t} + \sum \text{Year} + \varepsilon_{i,t} \quad (3)$$

**Table 1.** Descriptive statistics

Variables of interest	Value of observation	Mean value	Standard deviation	Median number	Maximum value	Minimum value
RD	13814	18.250	1.316	18.154	22.099	15.051
InventionG	13814	2.750	1.266	2.639	6.428	0.693
C_Score	13814	-0.190	1.344	0.016	1.488	-7.158
Size	13814	22.187	1.288	21.987	26.175	20.140
ROE	13814	0.066	0.110	0.072	0.300	-0.558
Lev	13814	0.397	0.189	0.391	0.847	0.055
Growth	13814	0.268	0.533	0.133	3.064	-0.584
Zd	13814	33.463	14.309	31.185	73.190	8.480
Goi	13814	0.611	0.318	0.548	1.916	0.133
Cpe	13814	0.078	0.086	0.047	0.447	0.001

## 4 Empirical Test and Result Analysis

### 4.1 Analysis of Descriptive Statistical Results

According to the Table 1, there is a big difference in the levels of innovation input and output among enterprises. The median of accounting conservatism is 0.016, and the standard deviation is 1.344, indicating that listed companies generally have accounting conservatism.

### 4.2 Correlation Result Analysis

The correlation test results in Table 2 show that the correlation coefficients between the main research variables in this paper are small and most of them are significant at the level of 1%. The VIF value is less than 1.26, indicating that each variable is independent of each other and there is no multicollinearity problem.

### 4.3 Analysis of Multiple Linear Regression Results

#### 1. Accounting conservatism and enterprise innovation.

The regression results of the effect of accounting conservatism on corporate innovation are shown in Table 3, where columns (1) and (2) are the regression results of the explained variables RD and InventionG, respectively. The R values are 0.618 and 0.144 respectively, indicating that the model has a good goodness of fit in general. The regression coefficients of accounting conservatism on corporate innovation are -0.01066 and -0.01826 respectively, and both of them are significantly negatively correlated at the confidence level of 1%. Hypothesis 1 in Table 3 is well verified.

#### 2. Accounting conservatism and firm innovation under different property rights.

**Table 2.** Correlation analysis

	RD	InventionG	C_Score	Size	ROE	Lev	Growth	Zd	Goi	Cpe
RD	1									
InventionG	0.448***	1								
C_Score	-0.256***	-0.235***	1							
Size	0.698***	0.355***	-0.224***	1						
ROE	0.141***	0.107***	-0.038***	0.087***	1					
Lev	0.327***	0.171***	-0.056***	0.541***	-0.210***	1				
Growth	-0.009	-0.006	0.024***	-0.061***	0.003	-0.004	1			
Zd	0.038***	0.091***	-0.046***	0.138***	0.123***	0.036***	-0.034*	1		
Goi	0.253***	0.139***	-0.077***	0.168***	0.205***	0.223***	-0.184***	0.131***	1	
Cpe	-0.058***	-0.017*	0.049***	-0.175***	0.022**	-0.252***	0.034***	-0.039***	-0.102***	1

**Table 3.** Empirical analysis

Variables of interest	RD	InventionG	RD	InventionG		RD2	InventionG2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
C_Score	-0.01066*** (-3.30)	-0.01826*** (-3.17)	-0.01116 (-1.61)	-0.01157*** (-3.35)	-0.00808 (-0.86)	-0.002681*** (-3.63)	-6.72843*** (-8.10)
_cons	-1.06212*** (-3.66)	-2.71190*** (-5.24)	-0.93641 (-1.27)	-1.70890*** (-5.75)	-0.32542 (-0.33)	-4.26240*** (-6.72)	-2.8e + 02*** (-3.75)
Control Variables	Control	Control	Control	Control	Control	Control	Control
Year	Control	Control	Control	Control	Control	Control	Control
Individual	Control	Control	Control	Control	Control	Control	Control
N	13805	13805	3815	9990	3815	9990	13805
R2	0.618	0.144	0.495	0.696	0.112	0.161	0.030

t statistics in parentheses \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01

This paper further divides the samples into two groups: state-owned enterprises and non-state-owned enterprises. In the group of state-owned enterprises, the regression coefficients of accounting conservatism on RD and InventionG are -0.01116 and -0.00808 respectively, indicating that accounting conservatism has no significant inhibitory effect on corporate innovation. In the group of non-state-owned enterprises, the regression coefficients of accounting conservatism on RD and InventionG are -0.01157 and -0.02681 respectively, which pass the 1% level test, indicating that accounting conservatism has a significant inhibitory effect on corporate innovation in non-state-owned enterprises.

## 5 Robustness Test

In the main regression analysis of this paper, “the natural logarithm of total RD expenditure” is used as the indicator to measure enterprise innovation input. In the main regression analysis, the indicator to measure the innovation output of enterprises is “Ln (1 + the number of patent applications),” which is replaced by “the number of patents granted to enterprises by the state” in the robustness test. The regression results are shown in Table 2. In columns (7) and (8), after replacing the explained variable, both are significant at the level of 1%. The regression results after changing the mode of innovation input and output still support the above research conclusions, indicating that the conclusions are robust.

## 6 Conclusions and Suggestions

This paper draws the following research conclusions: accounting conservatism is significantly negatively correlated with enterprise innovation; after further analyzing the impact of ownership nature, we find that the inhibitory effect of accounting conservatism on innovation is more significant in non-state-owned enterprises. Based on this, this paper puts forward the following research suggestions: Accounting robustness for enterprises is the double-edged sword, enterprises should consider the two sides of accounting robustness, according to their own business situation and development strategy set choose reasonable steady degree of accounting policy, guarantee the positive role of accounting robustness in the enterprise, and will not lead to the principle of significant inhibition influence on enterprise innovation, realize the maximum benefit. The government should strengthen its support for enterprises' innovation activities, and provide subsidies for enterprises' innovation activities, improve laws and regulations on financial subsidies, and regularly understand the progress of enterprises' innovation and supervise the whereabouts of innovation subsidy funds.

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