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Accounting Conservatism, R&D Manipulation, and Corporate Innovation: Evidence from China

Yi Shen * and Qingsong Ruan

School of Economics and Management, Tongji University, Shanghai 200092, China; rqs2000@163.com
* Correspondence: shenyisy2015@outlook.com

Abstract: Research and development (R&D) is the main driver for the sustainable development of corporate innovation. Given the prevalence of information asymmetry in R&D, executives opportunistically manipulate R&D investment. While accounting conservatism as a corporate governance mechanism can effectively reduce information asymmetry, few studies have focused on the relationship between the two. Based on Chinese listed companies in 2008–2019, this paper investigates the impact of accounting conservatism on R&D manipulation, as well as the moderating effect of internal control quality and tax enforcement efforts on this relationship. The results indicate that not only are the results more significantly negative in subgroups of low-level internal control and tax collection, but the coefficients of their cross-sectional variables are also positive. Therefore, accounting conservatism can effectively deter R&D manipulation, and this effect is weakened by internal control and tax enforcement. Additionally, the impact of accounting conservatism on manipulation differs in direction and lifecycle. The negative conservatism–manipulation relationship is more significant for upward manipulation and growing enterprises. Further research also suggests that conservatism's inhibitory effect on R&D manipulation is mediated by financial constraints, which enhances corporate innovation efficiency. The conclusions not only provide empirical evidence for the corporation to improve R&D efficiency but also provide the basis for the authorities to promote innovation supervision.

Keywords: accounting conservatism; R&D manipulation; internal control; tax enforcement; corporate innovation

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1. Introduction

Innovation is the core engine for the transformation of China's development model, which is undergoing a shift from high-speed growth to high-quality growth. The 13th Five-Year Plan advocates the vision of innovative, coordinated, green, open, and inclusive development, and in that regard, innovation fulfills an important role in advancing economic progress [1]. However, research and development (R&D), which is critical for the sustainability of innovation, is beset by a serious problem: information asymmetry. All projects generate asymmetric information between insiders and outsiders [2], not to mention R&D activities. Large investments, high professionalism, high concealment, and unclear accounting treatment borders define R&D activities, resulting in significant information asymmetry [3,4]. Information asymmetry makes government supervision more difficult and opens the door to R&D manipulation [5,6], and such manipulation may stifle an enterprise's innovation efficiency. Internally, executives manipulate R&D investments by employing accounting practices [7] or constructing pseudo-innovation activities, which may not boost real-world corporate innovation and technical advancement. Externally, executives use R&D manipulation to provide biased information to outside investors [8], thereby misleading external decisions.

Accounting conservatism, which represents accounting information quality, requires differential verifiability of a firm's gains and losses. One of the requirements is a downward

trend in gains, which translates to anticipating no profit, but all losses. The other requirement is the high level of verification criteria for gains, which involves delaying revenue recognition while speeding up expense recognition. Therefore, accounting conservatism is linked to internal accounting recognition and the quality of information delivered to outsiders. The former fulfills the internal governance function of conservatism, while the latter demonstrates the ability of conservatism to effectively reduce information asymmetry.

Based on the above requirements, in investment, accounting conservatism affects managerial risk taking, as well as reduces managerial incentives to make negative NPV (net present value) investments or inefficient investments [9,10], which reduces myopia management [11] and mitigates principal-agent problems. Externally, accounting conservatism enables outside investors to better monitor a firm's investment activities, reduces the risk premium of corporate financing, and disciplines self-interested decisions by executives [12,13]. R&D manipulation is the speculative behavior of executives and conveys biased R&D information to the outside. Does accounting conservatism still play the above-mentioned governance role at this point? When accounting conservatism is high, it becomes risky and difficult for executives to manipulate R&D investment, implying that conservatism may have an impact on R&D manipulation. Recent researches have concentrated on the economic consequences of accounting conservatism from forecast [11], risk [14,15], social responsibility [16,17], and profitability [18,19]. However, only a small part of the literature deals with the direct impact of accounting conservatism on R&D investment. Even for investment efficiency, there is no consensus on the relationship between accounting conservatism and investment. Some scholars confirm a positive relationship between conservatism and investment efficiency. In the situation of underinvestment, more conservative enterprises invest more, and in the situation of overinvestment, they invest less [20]. However, some scholars find that accounting conservatism is negatively related to executives' decisions on innovation investment. Conservative reporting imposes higher verification standards for returns, which induces managerial myopia and weakens the incentives for R&D investment [21,22]. They pay more attention to the real investment rather than the expected investment. Given that not all R&D investment is needed for innovation development, part of it is used for other purposes, namely R&D manipulation. That's what this paper tries to figure out the conservatism–manipulation relationship.

This paper investigates the connection between accounting conservatism and R&D manipulation by examining the following aspects. First, because accounting conservatism has governance implications both inside and outside the enterprise, this study considers the following two moderating ingredients: internal control and tax policy. For one thing, internal control quality is a vital factor that affects corporate decision making in R&D activities. For another, tax policy is one of the instruments to support R&D activities [23]. Second, R&D manipulation is a strategic behavior of executives to manipulate R&D investment, which includes both upward manipulation and downward manipulation. Furthermore, the propensity to invest in R&D activities is related to the stage of enterprise development. Therefore, the heterogeneity of direction and lifecycle in the conservatism–manipulation relationship is argued further in this paper. Finally, in the research on the influencing factors of R&D investments, financial constraints always act as an intermediary element. Additionally, when it comes to R&D investments, corporate innovation efficiency is a clear outcome that attracts investors' interest. That is why this paper discusses how conservatism affects R&D manipulation and the consequences of this effect.

Data for this research were collected using listed companies in China from 2008 to 2019. The following are the contributions of this paper to the literature. (1) Previous research on the influencing factors of R&D manipulation has primarily focused on equity incentive plans, tax breaks, returnee managers, and so on [24–26], with little literature on information asymmetry. By comparison, this paper directly focuses on the conservatism of corporate accounting information and its impact on R&D manipulation, which helps enrich the existing research. (2) By investigating the conservatism–manipulation relationship from the two perspectives of direction and lifecycle, this research further examines the

heterogeneous impact of accounting conservatism on R&D manipulation. (3) This paper investigates the impact path and economic consequences of the conservatism–manipulation relationship, providing empirical evidence for how the impact is made and what it leads to. In sum, all of these are beneficial to further understanding the relationship between accounting conservatism and R&D manipulation.

According to the results of this paper, accounting conservatism is significantly and negatively related to corporate R&D manipulation. Internal control quality and tax enforcement efforts both play a negative moderating role in the conservatism–manipulation relationship. Additionally, accounting conservatism effectively prevents the over-expensing of R&D expenditures and has an inhibitory impact on the R&D manipulation of enterprises in the growth phase. Lastly, by reducing financial constraints, accounting conservatism restrains R&D manipulation and ultimately promotes firm innovation.

The remaining part of the paper proceeds as follows. Section 2 presents a literature review and proposes research hypotheses. Section 3 describes the data and methodology. Section 4 elaborates on the empirical results. Section 5 conducts further study. Section 6 discusses the results. Finally, Section 7 provides the conclusions and suggestions.

2. Literature Review and Hypotheses Development

The following parts are the literature review and theoretical analyses of the conservatism–manipulation relationship. One part is a review of the literature on the concepts, modalities, and impacts of accounting conservatism and R&D manipulation. The other is whether accounting conservatism has an impact on manipulation and the moderating factors of the impact.

2.1. Literature Review

2.1.1. Accounting Conservatism

Accounting conservatism, as a financial reporting stance, is one of the most important characteristics of the quality of corporate accounting information. This financial reporting stance is a downward bias of accounting value to economic value [27]. Accounting conservatism is measured through asymmetric timeliness in loss and benefit verification. These direct impacts on financial reports finally influence the firm and the market. According to that, the overview of the effects of accounting conservatism is shown in Figure 1.

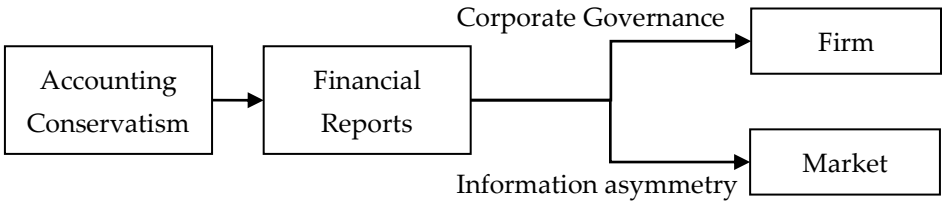

Figure 1. Overview of the effects of accounting conservatism.

For the company, accounting conservatism is positively related to the quality of corporate governance [28]. For one thing, accounting conservatism can improve investment efficiency by reducing underinvestment and unproductive overinvestment [20] and inhibiting executives' desire for building empires. For another, accounting conservatism has also been found to limit earnings management [29]. There is a manipulation of financial statements in many firms [30], and earnings management is related to the boardroom [31]. For the market, accounting conservatism facilitates the alleviation of information asymmetry and the provision of high-quality information about the firm [32]. Therefore, capital providers (debt and equity) obtain reliable and useful information about the firm and monitor the firm effectively, which improves market reactions and reduces the cost of debt and equity capital [33,34]. Accounting conservatism may promote corporate financing by mitigating the manipulation of financial information.

2.1.2. R&D Manipulation

R&D manipulation is a strategic behavior of executives in R&D. Based on the difference between real and expected R&D investment, R&D manipulation can be divided into expensing and capitalization. The judgment of expensing or capitalization depends on the decision of executives, so executives' decision making may affect the recognition of R&D investments, namely R&D manipulation.

Despite the clear accounting standards, the dependence on the judgment of expensing or capitalization leaves executives room for manipulation [35]. Accrual-based modification and real modification of R&D are two methods available. First, executives may resort to accrual-based activities to manipulate R&D expenditures. Some so-called R&D expenditures may not belong to R&D activities, which is one form of pseudo-innovation. For instance, items for non-R&D activities such as compensation, depreciation, and amortization of assets are classified as R&D expenditures, giving the impression of a significant R&D investment. On the contrary, items associated with R&D may be removed for some reasons, which could lead to an artificial reduction in R&D expenditures. Second, executives manipulate R&D by creating actual activities, which is another form of pseudo-innovation. Firms send out deceptive signals that they are involved in innovation by recruiting recruit personnel who do not actually participate in R&D, acquiring equipment that will not be used for future R&D, and so on. Despite all, R&D expenditure is a crucial indicator of the firm's current and future development [36].

By using the methods listed above, executives realize their manipulation in R&D, but why? What drives their decisions? R&D manipulation may be performed to increase executives' self-interest. A previous study indicates that executives may increase R&D investment for equity incentive proceeds [26]. R&D manipulation may also be used to cater to policies. Enterprises tend to increase their R&D investment for tax incentives, and their tax burden is lower than the whole [25].

2.2. Hypotheses Development

2.2.1. Accounting Conservatism and R&D Manipulation

As previously stated, accounting conservatism concerns internal revenue-loss recognition and external information asymmetry. Therefore, R&D manipulation is affected by conservatism both internally and externally.

Inside the enterprise, accounting conservatism is expressed as a governance mechanism that has a restraining effect on R&D manipulation by executives. Due to the separation of property rights, executives are motivated to make self-interested decisions that are detrimental to the development, such as inefficient investment, untruthful reporting, etc. [37]. However, accounting conservatism plays two roles in executives' R&D decision making. One requirement of accounting conservatism is a more timely recognition of costs than benefits. R&D activities are frequently carried out over a long period of time and are fraught with risk. Due to this requirement of conservatism and the uncertainty of R&D, executives tend to reduce low-risk positive-NPV projects and inefficient investment (overinvestment and underinvestment) [20], as well as earnings management [29,38]. This propensity to make prudent investments finally discourages non-compliant activities such as R&D manipulation. The other requirement of accounting conservatism is non-overestimating benefits and non-underestimating costs, namely disclosing bad news. Accounting conservatism restrains executives' earnings manipulation [39], improving the authenticity of corporate financial information and making executives more cautious in their accounting decisions. Hence, accounting conservatism has an impact on R&D manipulation both in terms of project selection and accounting decisions.

Outside the enterprise, accounting conservatism is represented as an information transmission mechanism, which also restrains R&D manipulation conducted by executives. R&D activities, as noted above, are always complicated, resulting in serious information asymmetry and difficult external regulation. External investors rely on enterprises' proactive disclosure of R&D operations. For firms with high conservatism, timely accounting

disclosures alleviate information asymmetry, reduce the adverse selection of external investors, and lower financing costs. A greater degree of accounting conservatism not only brings fewer negative reactions in the equity market and cheaper equity financing [33,34] but also lowers investors' expectations of corporate risks and makes debt financing more accessible [20]. Furthermore, low financing costs imply few financing constraints on enterprises, facilitating R&D investment [40]. When financial constraints are eased, enterprises are allowed to focus on improving R&D efficiency rather than manipulating R&D. Accounting conservatism, as a result, effectively reduces information asymmetry and R&D manipulation.

In summary, the impact of accounting conservatism on internal governance, as well as external information asymmetry, inhibits R&D manipulation. Based on this, the first hypothesis is proposed.

Hypothesis 1. *Accounting conservatism has a negative impact on R&D manipulation.*

2.2.2. Accounting Conservatism, Internal Control, and R&D Manipulation

According to field theory, a field is a critical mediator between the practices of social participants and the surrounding socioeconomic conditions; i.e., the form and power of the field affect the decision making of participants in the field [41]. Internal control in the enterprise is a symptom of the level of its internal governance and a guarantee of the quality of its financial information, with the goal of increasing its operational efficiency. Internal control is all about risk management, and the effect of R&D manipulation on corporate accounting information increases risk. Therefore, internal control may have a negative impact on R&D manipulation.

First, internal control mitigates the agency problems of enterprises. Internal control is implemented from the top down, covering corporate shareholders, executives, employees, and other subjects. Additionally, it contributes to forming an organic mechanism of mutual control, supervision, and collaboration by the effective distribution of authority, responsibility, and benefit among shareholders, directors, and supervisors. Multiple departments are involved in the complex R&D operations, which may easily lead to conflicts of responsibility and affect R&D investments. Studies indicate that high-quality internal control reduces agency conflicts and limits power rent-seeking, improving investment efficiency [42,43]. Consequently, internal control may also help to improve R&D investment efficiency and limit executives' inefficient R&D spending allocation.

Second, internal control promotes both internal and external information sharing, reducing information asymmetry [44]. By lowering information asymmetry across departments, internal control facilitates production collaboration, improves R&D investment efficiency, and restrains executives' self-interested behavior. Additionally, by lowering information asymmetry between executives and investors, internal control has a positive impact on financing. In a word, internal control improves information asymmetry, which reduces financing constraints.

Finally, internal control enables the supervision and management of firms' risks. In the R&D process, internal control with a focus on risk management requires the inspection of R&D personnel and equipment, the review of R&D expenses, and the regulation of R&D resource allocation. Meanwhile, for the R&D results, internal control requires innovation conversion efficiency, idle resource management, etc. Due to internal control running through the whole process of R&D, it effectively inhibits irregular operations such as manipulation. When the level of internal control quality is high, R&D manipulation by executives may be restrained.

High-quality internal control, as previously noted, helps enhance corporate governance, alleviate information asymmetry, and strengthen risk management. Internal control governs the firm at the institutional level, whereas conservatism governs at the accounting standard specification level. According to the fundamental norms of corporate internal control in China, high-quality internal control is beneficial not only for restraining the

opportunistic behavior of executives [45] and regulating enterprise management but also for increasing market confidence and investments in enterprises [46]. Compared with accounting conservatism, internal control promotes the establishment of a more proactive and systematic system that not only restrains power but also defends against risks [47]. With a high quality of internal control, inside the enterprise, the self-interest motivation of executives is directly suppressed and guided, while outside the enterprise, internal control protects investors' interests and reduces their reliance on conservatism. In fact, when the quality of internal control is low, accounting conservatism has to pay more to deal with problems.

In sum, the negative effect of accounting conservatism on R&D manipulation is greater when the quality of internal control is low. Based on this, the second hypothesis is proposed.

Hypothesis 2. *The quality of internal control weakens the negative relationship between accounting conservatism and R&D manipulation.*

2.2.3. Accounting Conservatism, Tax Enforcement, and R&D Manipulation

Taxation is the primary source of national revenue and a key tool for macroeconomic management. China's tax system is conducive to building a sound tax environment. Based on the intermediary role of the field, tax, as an external regulatory policy of enterprises, has a non-negligible impact on R&D manipulation.

The impact of tax enforcement on R&D manipulation is determined by the costs and benefits. When it comes to costs, a high degree of tax collection often entails tough tax levies and inspections, indicating a high audit risk for enterprises, and such audits are supported by laws such as the Taxes Collection Act. Threatened by these audits, executives have difficulties engaging in self-interested activities. Additionally, tax collection is related to the enterprises' profit. Higher tax expenses result in lower after-tax cash flow, which in turn inhibits R&D investment [48,49] and increases adjustment costs for R&D, limiting manipulation. Therefore, from the perspective of costs, tax collection may have a suppressive effect on R&D manipulation.

In terms of benefits, the tax incentive is a major motivator for R&D manipulation. With the increase in taxes collected, the reduced cash flow raises the economic pressure on enterprises, so a reasonable and legal reduction in tax expenditures becomes an essential priority. Tax incentives have a positive effect on R&D investments [50]. Owing to tax incentives, more R&D investments, in turn, effectively reduce the tax burden of enterprises, which drives executives to conduct R&D manipulation to obtain tax breaks [25]. Furthermore, the information asymmetry between tax authorities and enterprises makes it difficult for the government to monitor and inspect R&D activities, which opens the possibility of R&D manipulation. Overall, from the perspective of benefits, tax incentives may induce R&D manipulation.

As noted above, on the one hand, tax collection raises the cost of R&D manipulation; on the other hand, it stimulates manipulation for tax incentives. How do firms strike a balance between the two? In fact, for enterprises, the benefits of tax collection may outweigh the costs. First, a high tax burden imposed by increasing tax collection may reduce the audit risk. Enterprises and tax authorities play a game against each other. Due to information asymmetry, tax authorities are forced to scrutinize enterprises in a variety of ways, and low tax payment, in turn, makes enterprises an easy target for audit in this situation. As a result, when tax enforcement efforts are high, the heavy tax burden may reduce the possibility of R&D manipulation being audited.

Second, the loss of tax revenue to governments owing to R&D manipulation may not necessarily increase audit risk but result in the transfer of tax to non-R&D-manipulated enterprises. The Chinese government system is a cascading administrative system based on a multi-level vertical structure. Under this centralized fiscal system, most local governments are faced with financial targets from higher levels, which leads to great fiscal pressure. To complete fiscal targets, local governments have an incentive to interfere with tax collection.

Meanwhile, the local tax bureau is led both by the same-level local government and the higher-level tax bureau. The 1994 tax-sharing reform also enables local governments to alleviate their financial pressure through tax collection. Therefore, the local government has the incentive and the authority to affect tax collection. Since the enterprise income tax is an important source of local finance, the decreased amount of tax by manipulation makes local government prone to alleviating fiscal pressure by regulating tax collection [51]. It is believed that in order to fulfill their tax collection budget, local governments would enhance tax enforcement. However, the R&D audit of enterprises is so difficult that the tax bureau may pass the tax burden on to non-R&D-manipulated enterprises [52]. In the end, rather than increasing the risk of R&D manipulation being investigated, R&D manipulators realize a tax burden shift to non-R&D-manipulators.

In conclusion, despite strict tax enforcement, enterprises care more about the benefits of R&D manipulation than the costs, which finally reduces the disincentive effect of accounting conservatism on R&D manipulation. Based on this, the third hypothesis is proposed.

Hypothesis 3. *Tax enforcement weakens the negative relationship between accounting conservatism and R&D manipulation.*

Based on the previous hypotheses development, all hypotheses are shown in Figure 2.

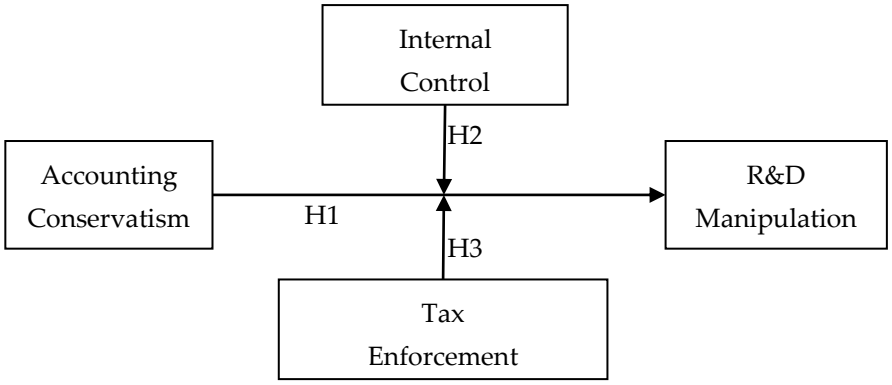

Figure 2. Conceptual model of the hypotheses tested.

3. Data and Methodology

3.1. Data Sources

This research takes A-share listed companies on Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) from 2008 to 2019. SSE and SZSE are secondary market for stock trading, and companies in both two exchanges are public companies. The screening procedures are as follows: (1) exclude enterprises in special treatment (ST) and particular transfer (PT); (2) exclude enterprises with missing or unavailable data; (3) exclude enterprises in finance and insurance; and (4) exclude enterprises delisted during the observation period. Finally, 14,309 observations are obtained. This sample contains 2565 companies of all sizes. In addition, to reduce the influence of extreme values on the test, this paper winsorizes the continuous variables at the 1% level. The data processing software is Stata 16.0.

Accounting conservatism, R&D, and other basic financial data come from the CSMAR database. Natures of property rights, industry, etc., are from the Wind database. Government taxation, output value of various industries, etc., are from the EPSDATA data platform (more detail in Appendix B).

3.2. Variable Definition

3.2.1. Explained Variable

R&D manipulation is measured using the following models [24,53].

$$\frac{RD_{i,t}}{TA_{i,t-1}} = \alpha_0 + \frac{\alpha_1}{TA_{i,t-1}} + \alpha_2 MV_{i,t} + \alpha_3 TBQ_{i,t} + \alpha_4 \frac{INT_{i,t}}{TA_{i,t-1}} + \alpha_5 \frac{RD_{i,t-1}}{TA_{i,t-1}} + \varepsilon \quad (1)$$

$$NM\_RD_{i,t} = \hat{\alpha_0} + \frac{\hat{\alpha_1}}{TA_{i,t-1}} + \hat{\alpha_2} MV_{i,t} + \hat{\alpha_3} TBQ_{i,t} + \hat{\alpha_4} \frac{INT_{i,t}}{TA_{i,t-1}} + \hat{\alpha_5} \frac{RD_{i,t-1}}{TA_{i,t-1}} \quad (2)$$

$$AB\_RD_{i,t} = \frac{RD_{i,t}}{TA_{i,t-1}} - NM\_RD_{i,t} \quad (3)$$

Here, RD is R&D expenditure, TA is total assets, MV is the logarithm of the firm's market value, TBQ is the firm's Tobin Q, and INT is operating profit. NM_RD is the normal R&D expenditure obtained from model (2) based on the coefficients estimated from model (1), and AB_RD is the firm's abnormal R&D expenditure. Since manipulation includes both positive and negative manipulation, and this paper attempts to assess the impact of accounting conservatism on R&D manipulation, AB_RD is treated as an absolute value. Additionally, this value is multiplied by 100 times to eliminate magnitude differences among variables.

3.2.2. Explanatory Variable

Accounting conservatism is measured using the following ACF model [54].

$$ACC_{i,t} = \beta_0 + \beta_1 DR_{i,t} + \beta_2 CFO_{i,t} + \beta_3 DR_{i,t} \times CFO_{i,t} + \mu \quad (4)$$

Here, ACC is total accruals, CFO is net cash flows from operating activities, and DR is a dummy variable that takes the value of 1 when CFO < 0 and 0 vice versa. The coefficients of the equation are estimated by model (4), where β_2 is the relationship between accruals and positive operating cash flows; β_3 is the increment of the sensitivity of accruals to negative operating cash flows compared to the sensitivity to positive operating cash flows, and $\beta_2 + \beta_3$ is the overall response of accruals to operating cash flows. The coefficient β_3 is used to present accounting conservatism (ACF). Additionally, in the robustness test, this study uses C_SCORE based on the Basu model to measure conservatism.

3.2.3. Moderating Variables

Corporate moderating variable—internal control quality (ICQ) is measured by the logarithm of the internal control index published by DIB.

Government moderating variable—tax enforcement effort (TE), is borrowed from a previous study [55] and based on the following models.

$$\frac{T_{i,t}}{GDP_{i,t}} = \alpha_0 + \alpha_1 \frac{IND1_{i,t}}{GDP_{i,t}} + \alpha_2 \frac{IND2_{i,t}}{GDP_{i,t}} + \alpha_3 \frac{OPEN_{i,t}}{GDP_{i,t}} + \varepsilon \quad (5)$$

$$\left(\frac{\hat{T_{i,t}}}{GDP_{i,t}}\right) = \hat{\alpha_0} + \hat{\alpha_1} \frac{IND1_{i,t}}{GDP_{i,t}} + \hat{\alpha_2} \frac{IND2_{i,t}}{GDP_{i,t}} + \hat{\alpha_3} \frac{OPEN_{i,t}}{GDP_{i,t}} \quad (6)$$

$$TE = \frac{T_{i,t}}{GDP_{i,t}} / \left(\frac{\hat{T_{i,t}}}{GDP_{i,t}}\right) \quad (7)$$

Here, T is tax revenue, GDP is gross domestic product, IND1 is the output value of the primary industry, IND2 is the output value of the secondary industry, and OPEN is the total import and export value. The proposed tax revenue is obtained by model (6) based on coefficients estimated from model (5), and according to model (7), the ratio of real tax revenue to proposed tax revenue is used to represent TE.

3.2.4. Control Variables

Previous research indicates that R&D investment is closely related to enterprise control variables [26,56,57]. These variables include enterprise size (SIZE), leverage (LEV), Tobin q (TBQ), size of board (BOARD), dual role (DUL), ownership concentration (SHR), enterprise age (AGE), the independence of the board (BI), R&D intensity (RDI), profitability (ROA) and ownership type (SOE). Meanwhile, manipulation is the strategic behavior of executives, so we also take executives 'compensation (COMP) into consideration [57]. The audit of accounting firms (BIG4) is also an important factor influencing R&D manipulation [58]. Finally, this paper control for year fixed effects (YEAR) and industry fixed effects (IND). Since manufacturing accounts for a relatively large share of all industries, manufacturing samples are classified by secondary industry codes, and other industries are classified by primary industry codes.

All definitions and measurements of variables are shown in Table A2 (in Appendix B).

3.3. Model Specification

In order to study the impact of accounting conservatism on R&D manipulation, based on previous research [26,57], the models are estimated as follows:

Model (5) for testing H1 is shown as follows:

$$AB\_RD_{i,t} = \alpha_0 + \alpha_1 ACF_{i,t} + \sum CONTROL + \sum YEAR + \sum IND + \varepsilon \quad (8)$$

Model (6) for testing H2 is shown as follows:

$$AB_{RDi,t} = \alpha_0 + \alpha_1 ACF_{i,t} \quad +\alpha_2 ICQ_{i,t} + \alpha_3 ICQ_{i,t} \times ACF_{i,t} + \sum CONTROL + \sum YEAR + \sum IND + \varepsilon \quad (9)$$

Model (7) for testing H3 is shown as follows:

$$AB\_RD_{i,t} = \alpha_0 + \alpha_1 ACF_{i,t} \quad +\alpha_2 TE_{i,t} + \alpha_3 TE_{i,t} \times ACF_{i,t} + \sum CONTROL + \sum YEAR + \sum IND + \varepsilon \quad (10)$$

By applying model (8), this paper groups the sample according to the level of internal control and tax enforcement and further examines the moderating effect of these two factors to test H2 and H3. The full version of models (8)–(10) can be seen in Table A1 (in Appendix A).

4. Empirical Results

4.1. Descriptive Statistical Analysis

Table 1 shows the descriptive statistical analysis of the main variables. According to the statistical results of Panel A, the maximum value of R&D manipulation (AB_RD) is 10.65, the minimum value is 0, and the standard deviation is 0.824, which indicates that the degree of R&D manipulation varies widely among enterprises. Furthermore, the maximum value of accounting conservatism (ACF) is 0.517, and the minimum value is −3.911, indicating that accounting conservatism is unequally distributed and varies widely.

It can be seen from the data in Panel B that the mean value of R&D manipulation in the group of a lower ACF level is 0.598, while for the higher-level group, the value is 0.560, and the difference between the groups is significant at the 1% level. Therefore, the test tentatively verifies that accounting conservatism may have an inhibitory effect on R&D manipulation. In addition, R&D manipulation is relatively lower in enterprises with a higher quality of internal control as well as in enterprises in regions with lower tax enforcement, and the differences between both groups are significant. The conclusions are essentially consistent with the previous analysis.

Table 1. Variable descriptive statistics.

Panel A Descriptive Statistics					
Variable	**Minimum**	**Maximum**	**Mean**	**Median**	**Standard Error**
AB_RD	0	10.65	0.579	0.350	0.824
ACF	−3.911	0.517	−0.764	−0.756	0.485
ICQ	2.485	3.861	3.528	3.592	0.243
TE	0.605	1.551	0.994	0.968	0.192
SIZE	19.35	26.39	22.31	22.13	1.230
LEV	0.027	0.925	0.433	0.428	0.196
TBQ	0.815	17.68	2.123	1.699	1.368
BOARD	1.609	2.708	2.140	2.197	0.198
DUL	0	1	0.248	0	0.432
SHR	0.084	0.758	0.335	0.314	0.144
AGE	1.609	3.555	2.836	2.890	0.327
BI	0.250	0.600	0.374	0.333	0.054
Big4	0	1	0.057	0	0.232
RDI	0	0.832	0.042	0.033	0.049
COMP	11.00	18.05	14.38	14.36	0.707
ROA	−0.415	0.245	0.036	0.035	0.068
SOE	0	1	0.367	0	0.482
Panel B Comparison between Treatment Group and Control Group					
AB_RD	**Treatment (L) Mean**		**Control (H) Mean**		**t-Value**
ACF	0.598		0.560		2.762 ***
ICQ	0.593		0.565		2.035 **
TE	0.563		0.595		−2.363 **

Note: ** $p < 0.05$, and *** $p < 0.01$. L refers to grouping variables of low level, while H refers to grouping variables of high level.

4.2. Correlation Coefficient Analysis

Table 2 shows the correlation analysis of key variables. The table below illustrates that Spearman's coefficient of ACF and AB_RD is −0.022, which is significant at the 1% level. Meanwhile, Pearson's coefficient is not significant but has a negative sign. Therefore, there might be a negative correlation between conservatism and manipulation. The relationship between ICQ and AB_RD is significantly negative, indicating that the higher the quality of a firm's internal control, the lower the degree of R&D manipulation is. Additionally, the relationship between TE and AB_RD is significantly positive, indicating that the higher the intensity of tax enforcement, the higher the degree of R&D manipulation is. Considering that the correlation analysis only involves the relationship between single variables and does not consider the influence of other factors, only a preliminary understanding of the relationship is given here. The correlation coefficient values between other main variables are all below 0.07, and the VIF test result is less than 5, indicating that there is no serious multi-collinearity problem.

Table 2. Correlation coefficient matrix of key variables.

Variables	**AB_RD**	**ACF**	**ICQ**	**TE**
AB_RD	1	−0.022 ***	−0.021 **	0.021 **
ACF	−0.007	1	0.011	−0.044 ***
ICQ	−0.060 **	−0.006	1	−0.061 ***
TE	0.017 **	−0.007	−0.062 ***	1

Note: The upper triangle is the Spearman correlation coefficient, and the other is the Pearson correlation coefficient. ** $p < 0.05$, and *** $p < 0.01$.

4.3. Results

All regressions are shown in Table 3. The results of Model 5 to test the impact of accounting conservatism on R&D manipulation are given in Column 1. Additionally, Model 6 and Model 7 are used to test the moderating role of internal control and tax enforcement, and the results are in Columns 2–7. After the F test and Hausman test, this paper adopts a fixed effect model for reducing possible omitted variable bias. In addition, since R&D manipulation may not be influenced by time-invariant factors, fixed effect models are the appropriate choice.

Table 3. Results for the effect of accounting conservatism on R&D manipulation.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		ICQ_L	ICQ_H	ICQ	TE_L	TE_H	TE
ACF	−0.033 **	−0.040 **	−0.027	−0.388 *	−0.074 ***	0.006	−0.236 **
	(−2.433)	(−2.030)	(−1.395)	(−1.881)	(−3.545)	(0.367)	(−2.318)
ICQ				−0.043			
				(−0.758)			
ICQ × ACF				0.100 *			
				(1.741)			
TE							0.153 *
							(1.819)
TE × ACF							0.208 **
							(2.101)
SIZE	−0.010	−0.014	−0.005	−0.010	−0.023	0.005	−0.010
	(−0.905)	(−0.762)	(−0.384)	(−0.862)	(−1.454)	(0.317)	(−0.893)
LEV	0.327 ***	0.298 ***	0.353 ***	0.322 ***	0.421 ***	0.222 **	0.326 ***
	(5.430)	(3.714)	(4.318)	(5.361)	(5.436)	(2.478)	(5.455)
TBQ	0.028 ***	0.025 **	0.030 ***	0.028 ***	0.031 ***	0.023 **	0.028 ***
	(3.665)	(2.515)	(2.825)	(3.637)	(2.960)	(2.312)	(3.641)
BOARD	−0.106 *	−0.127	−0.070	−0.106 *	−0.154 **	−0.055	−0.104 *
	(−1.906)	(−1.608)	(−1.004)	(−1.898)	(−2.016)	(−0.745)	(−1.866)
DUL	0.019	0.027	0.012	0.017	−0.013	0.061 **	0.019
	(0.965)	(1.012)	(0.448)	(0.846)	(−0.558)	(1.991)	(0.975)
SHR	0.167 **	0.182 *	0.155 **	0.167 ***	0.166 **	0.176 *	0.169 ***
	(2.570)	(1.859)	(2.149)	(2.578)	(2.126)	(1.755)	(2.606)
AGE	−0.020	0.027	−0.072 *	−0.023	−0.000	−0.037	−0.020
	(−0.668)	(0.639)	(−1.889)	(−0.789)	(−0.007)	(−0.790)	(−0.679)
BI	−0.024	0.094	−0.098	−0.006	0.120	−0.273	−0.024
	(−0.142)	(0.384)	(−0.488)	(−0.037)	(0.522)	(−1.142)	(−0.143)
BIG4	−0.020	−0.006	−0.023	−0.019	−0.027	−0.017	−0.020
	(−0.596)	(−0.092)	(−0.626)	(−0.562)	(−0.587)	(−0.354)	(−0.605)
RDI	4.064 ***	4.045 ***	4.074 ***	4.065 ***	4.770 ***	3.441 ***	4.064 ***
	(11.351)	(8.331)	(10.236)	(11.350)	(10.667)	(6.861)	(11.360)
COMP	0.033 **	0.048 **	0.022	0.037 **	0.061 ***	−0.007	0.033 **
	(2.094)	(2.041)	(1.166)	(2.307)	(3.216)	(−0.285)	(2.082)
ROA	1.181 ***	1.323 ***	1.023 ***	1.191 ***	1.129 ***	1.285 ***	1.180 ***
	(7.934)	(6.058)	(5.544)	(7.970)	(5.665)	(5.914)	(7.941)
SOE	0.048 **	0.069 **	0.029	0.049**	0.053*	0.034	0.047 **
	(2.313)	(2.338)	(1.150)	(2.389)	(1.942)	(1.133)	(2.288)
_CONS	0.268	−0.005	0.390	0.300	−0.058	0.766*	0.115
	(1.075)	(−0.014)	(1.272)	(1.004)	(−0.194)	(1.906)	(0.446)
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AdjR^2	0.094	0.098	0.093	0.095	0.107	0.088	0.094
N	14309	7056	7253	14309	7204	7105	14309

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$. _L refers to grouping variables of low level, while _H refers to grouping variables of high level.

Based on the results in Column 1, for the full sample data, the coefficient of R&D manipulation is significantly negative at 5%, indicating that accounting conservatism helps inhibit executives from engaging in R&D manipulation. This shows that the higher the degree of conservatism, the lower the R&D manipulation. Hypothesis 1 is supported. It can also be seen that manipulation is positively related to debt leverage, ownership concentration, compensation, profitability, etc. Similarly, the size of the board has a significant negative impact on manipulation, which is kind of opening the black box of the boardroom [31]. This finding is consistent with another study [59], indicating the board attributes to enhance corporate monitoring and ensure investment efficiency.

In order to verify Hypothesis 2, the samples are grouped into low ICQ enterprises and high ICQ enterprises. The results are given in Columns 2 and 3. Among them, ICQ_L and ICQ_H, respectively, represent whether the quality of internal control is low or not. This study also further performs an analysis on cross-sectional terms, and the results are in Column 4. From the results, the coefficient of ACF is significantly negative when the quality of internal control is low but insignificant when the quality is high. This is because high-quality internal control indicates a sound decision-making mechanism, leaving accounting conservatism with a small window of opportunity in governance. For enterprises faced with a low level of internal control, the inhibitory effect of conservatism on manipulation is highlighted. Meanwhile, the coefficient of the cross-sectional term is significantly positive, while that of conservatism is negative. It is clear that internal control has a restraining effect on the conservatism–manipulation relationship. Hypothesis 2 is verified.

In order to further verify Hypothesis 3, the samples are grouped into low TE enterprises and high TE enterprises. The results are given in Column 5 and Column 6. Similarly, TE_L and TE_H, respectively, represent whether tax enforcement is low or not. The analysis of cross-sectional terms and results are in Column 7. According to the results, the coefficient of ACF is significantly negative when the intensity of tax enforcement is low while insignificant when it is high. Since R&D investment facilitates corporate tax avoidance, more manipulation is carried out to reduce the tax burden caused by high tax enforcement efforts. This stimulation to manipulation reduces the inhibitory effect of accounting conservatism. In addition, the significantly positive coefficient of the crossover item in Column 7 also verifies that tax enforcement weakens the conservatism–manipulation relationship. Hypothesis 3 is confirmed.

4.4. Robustness Analyses

4.4.1. Endogeneity Test

There may be an issue of endogeneity in the connection between accounting conservatism and R&D manipulation. Although accounting conservatism has an inhibitory effect on manipulation, executives' intervention in R&D investment may, in turn, affect accounting conservatism. Therefore, to test the above endogeneity problem, this research adopts the instrumental variable for the 2SLS test. The instrumental variable is defined by the average conservatism of other enterprises (excluding each sample enterprise) in the same industry and year. This is because enterprises in the same industry and year have a large similarity to the sample, and to some degree, their accounting conservatism should be highly correlated. Meanwhile, the accounting conservatism of other enterprises does not have an impact on the R&D manipulation of the sample one.

Table 4 shows the results of the endogeneity test. The regression results indicate that accounting conservatism has a suppressive effect on R&D manipulation. Furthermore, based on the subgroup analysis, the negative impact is significant when the quality of internal control is low, and the intensity of tax enforcement is low. The results demonstrate that the conclusions of this paper are robust.

Table 4. Results for endogeneity test.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		ICQ_L	ICQ_H	ICQ	TE_L	TE_H	TE
ACF	−0.023 *	−0.032 *	−0.025	−0.352 *	−0.064 ***	0.016	−0.170 *
	(−1.852)	(−1.837)	(−1.337)	(−1.784)	(−3.375)	(0.969)	(−1.939)
ICQ				−0.049			
				(−0.889)			
ICQ × ACF				0.093 *			
				(1.680)			
TE							0.109
							(1.400)
TE × ACF							0.150 *
							(1.737)
_CONS	0.276	0.485	0.660 **	0.327	−0.057	0.790 **	0.167
	(1.108)	(1.328)	(2.364)	(1.222)	(−0.189)	(1.962)	(0.650)
CONTROLs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AdjR^2	0.094	0.085	0.083	0.095	0.107	0.089	0.094
N	14,309	7056	7253	14,309	7204	7105	14,309

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

4.4.2. Tobit Model

R&D manipulation is measured by the absolute value, which may lead to model setting bias when the value is zero. Therefore, the Tobit model is used to re-test the regression. Table 5 shows the results of the Tobit model. The coefficient on ACF is negative in the full sample, and it is only significant in the low-quality internal control group and the low-intensity tax enforcement group. The Tobit model's conclusions are almost identical to those of the prior analysis.

Table 5. Results for the Tobit model.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		ICQ_L	ICQ_H	ICQ	TE_L	TE_H	TE
ACF	−0.031 **	−0.038 *	−0.026	−0.428 **	−0.072 ***	0.006	−0.233 ***
	(−2.243)	(−1.800)	(−1.390)	(−2.001)	(−3.696)	(0.313)	(−3.153)
ICQ				−0.143 ***			
				(−2.624)			
ICQ × ACF				0.110 *			
				(1.834)			
TE							0.162 **
							(2.274)
TE × ACF							0.207 ***
							(2.785)
_CONS	0.293	0.090	0.461	0.949 ***	0.000	0.738 *	0.136
	(1.107)	(0.233)	(1.364)	(3.208)	(0.000)	(1.886)	(0.499)
CONTROLs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.040	0.040	0.042	0.038	0.046	0.038	0.041
N	14309	7056	7253	14309	7204	7105	14309

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

4.4.3. Substitute Variable

The ACF model is previously used to estimate accounting conservatism. Based on previous research [60], another estimation of the Basu model is as follows.

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \beta_1 + \beta_2 D_{i,t} + \beta_3 R_{i,t} + \beta_4 D_{i,t} \times R_{i,t} + \varepsilon \quad (11)$$

$$G\_SCORE = \beta_3 = \mu_1 + \mu_2 SIZE_{i,t} + \mu_3 LEV_{i,t} + \mu_4 MB_{i,t} \quad (12)$$

$$C\_SCORE = \beta_4 = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 LEV_{i,t} + \lambda_4 MB_{i,t} \quad (13)$$

Here, model 11 is the Basu model. *EPS* is earnings per share, *P* is the stock price, *R* is the difference between stock returns and market returns, and *D* is a dummy variable that takes the value of 1 when $R < 0$ and 0 and vice versa. Firm size (SIZE), leverage (LEV), and book-to-market ratio (MB) are incorporated in model (12) and model (13). By bringing models (12) and (13) into model (11), the coefficients are obtained, and the coefficient β4 of D × R presents accounting conservatism (C_SCORE).

The regression results appear in Table 6, from which it can be seen that accounting conservatism and R&D manipulation significantly and negatively correlate, and the correlation is more significant for lower quality of internal control and weaker intensity of tax enforcement. The coefficient of the cross term of internal control is not significant, but the sign is positive. Therefore, the previous findings have not changed substantially.

Table 6. Results for substitution variables.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		ICQ_L	ICQ_H	ICQ	TE_L	TE_H	TE
C_SCORE	−0.537 ***	−0.810 **	−0.324	−1.728	−0.712 **	−0.445	−1.357 ***
	(−2.579)	(−2.566)	(−1.096)	(−1.156)	(−2.379)	(−1.491)	(−3.098)
ICQ				−0.110 ***			
				(−2.712)			
ICQ × C_SCORE				0.322			
				(0.782)			
TE							0.030
							(0.636)
TE × C_SCORE							0.926 **
							(2.212)
_CONS	−0.373	−0.894 *	−0.044	−0.174	−0.869 *	0.182	−0.281
	(−1.015)	(−1.672)	(−0.091)	(−0.460)	(−1.871)	(0.314)	(−0.768)
CONTROLs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AdjR^2	0.094	0.099	0.094	0.095	0.107	0.090	0.095
N	14,309	7056	7253	14,309	7204	7105	14,309

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

4.4.4. Different Sample

There are significant differences between enterprises listed on the main board and those listed on KCI and GEM in terms of governance structure, profitability, development ability, and solvency. Therefore, the selection of samples may affect the results of this paper. To enhance the robustness of the conclusions, the main board enterprises are used to re-test the regression. Table 7 shows that the new full sample and subgroup results are similar to previous research.

Table 7. Results for different samples.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		ICQ_L	ICQ_H	ICQ	TE_L	TE_H	TE
ACF	−0.028 **	−0.041 *	−0.013	−0.458 **	−0.061 ***	0.008	−0.196 *
	(−1.985)	(−1.785)	(−0.793)	(−2.142)	(−3.024)	(0.409)	(−1.832)
ICQ				−0.031			
				(−0.517)			
ICQ × ACF				0.122 **			
				(2.050)			
TE							0.082
							(0.948)
TE × ACF							0.187 *
							(1.784)
_CONS	0.239	−0.031	0.346	0.234	−0.182	0.873 **	−0.401
	(0.912)	(−0.081)	(1.074)	(0.756)	(−0.581)	(2.043)	(−1.458)
CONTROLs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AdjR^2	0.104	0.115	0.096	0.105	0.118	0.099	0.091
N	11,896	5735	6161	11,896	6913	4983	11,896

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

5. Further Study

5.1. Accounting Conservatism, the Direction and Lifecycle of R&D Manipulation

The analysis in Section 4 indicates that accounting conservatism significantly inhibits R&D manipulation. However, there are two kinds of policy choices for R&D manipulation: expensing and capitalization. The former is upward manipulation, while the latter is downward manipulation. Which kind of manipulation is more affected by accounting conservatism? In addition, like organisms, firms have life cycles. According to the life cycle theory, enterprises in different life cycle stages have significant differences in organizational structure, operation, and strategy. Is there any difference in the impact of accounting conservatism on R&D manipulation among firms of different life stages? This paper conducts further study in order to answer the above two questions. To unravel the direction of manipulation, the actual value of abnormal R&D expenditure is used as the explained variable in model 5 [61], and the results are shown in Columns 1–2. To assess the heterogeneity of the lifecycle, this paper separates the corporate life cycle into several stages. The life cycle stage of an enterprise is classified according to the sign of net cash flow [62]. Since the samples in this paper are all listed companies and have basically passed the introduction stage, the cycles are combined into three stages as follows in Table 8. The results are shown in Columns 3–5.

Table 8. Results for the direction and lifecycle of R&D manipulation.

Variables	(1)	(2)	(3)	(4)	(5)
	ABRD < 0	ABRD > 0	Growth	Maturity	Decline
ACF	0.010	−0.069 **	−0.038 *	−0.012	−0.015
	(0.918)	(−2.127)	(−1.797)	(−0.666)	(−0.431)
_CONS	−0.454 **	−0.338	0.158	0.448	0.695
	(−2.047)	(−0.654)	(0.434)	(1.160)	(1.629)
CONTROLs	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes
IND	Yes	Yes	Yes	Yes	Yes
AdjR^2	0.070	0.114	0.105	0.103	0.113
N	8743	5566	6481	5277	2551

Note: * $p < 0.1$, and ** $p < 0.05$.

All of the results are presented in Table 8. Based on results in Columns 1–2, the coefficient of ACF is significantly negative when actual abnormal R&D expenditure is positive, while insignificant when it is not. Positive actual abnormal R&D expenditure means that there is more real R&D expenditure than expected, which is also called expensing treatment of R&D manipulation. This may be due to the misclassification of items that are not originally part of R&D expenses. For instance, the enterprise may include compensation and depreciation of assets that are not generated by R&D in R&D expenses. This may also be related to resource misallocation, such as purchasing equipment or hiring personnel that will not be needed for R&D. Results in Columns 1–2 indicate that accounting conservatism can effectively deal with the upward manipulation of R&D expenditure, which also demonstrates that conservatism helps curb expensing in R&D investment. The results of the first two columns indirectly reflect that accounting conservatism has a suppressive effect on overinvestment, consistent with existing literature findings [20].

The findings in Columns 3–5 indicate that the inhibitory effect of accounting conservatism on R&D manipulation is significant in the growth period while insignificant in the maturity and decline periods. During the growth period, production begins to ramp up, and overall strength improves, resulting in a rapidly increasing cash flow. Meanwhile, more and more professional executives are introduced [63], and they are focused on expansion opportunities and aggressive investments [64]. Both managerial power and aggressive intentions provide incentives for executives to engage in speculative activities such as R&D manipulation. However, since the rapid growth of enterprises results in large capital needs, enterprises are particularly concerned about information asymmetry and credible disclosure for easy access to financing [65]. Therefore, high accounting conservatism is necessary to finance development potential, hence discouraging R&D manipulation.

For enterprises in the maturity stage, the market position has begun to solidify, and internal management becomes intricate and complex. Both internal control and external supervision tend to be improved. Consequently, executives' speculation will be scrutinized more closely, and R&D manipulation will be more costly. For enterprises in the declining stage, executives may be more concerned about their professional reputation and may avoid non-compliant practices such as R&D manipulation. Therefore, in these two stages, the impact of accounting conservatism on R&D manipulation is not significant.

5.2. Accounting Conservatism, Financial Constraints, and R&D Manipulation

Accounting conservatism is a signal for presenting the quality of accounting information [66], and it is beneficial for alleviating information asymmetries between insiders and outsiders in financing [67]. Conservatism is also helpful in mitigating agency conflict [68]. Therefore, the higher the accounting conservatism, the lower the information asymmetries and agency costs, which may reduce financial constraints. Given that financial constraints inhibit R&D investments [40], greater conservatism makes it easier for enterprises to obtain R&D financing. R&D manipulation is carried out to cater to policy preferences and credit resources, so when firms have easy access to funding, will they still engage in R&D manipulation?

In order to answer this question, the KZ index is used to measure the degree of financial constraints faced by enterprises [69]. The test of the intermediation effect is conducted through the three-step intermediation test. The first step tests how accounting conservatism affects corporate R&D manipulation, and this result has been verified in the previous analysis. The second step tests how accounting conservatism influences financial constraints. The third step examines the simultaneous effects of accounting conservatism and financial constraints on R&D manipulation. Table 9 displays the results.

Table 9. Results for the test of the mediating role of financial constraints.

Variables	(1)	(2)	(3)
	AB_RD	**KZ**	**AB_RD**
ACF	−0.033 **	−0.044 *	−0.031 **
	(−2.433)	(−1.778)	(−2.313)
KZ			0.100 ***
			(9.271)
_CONS	0.268	−3.642 ***	0.627 **
	(1.075)	(−5.924)	(2.747)
CONTROLs	Yes	Yes	Yes
YEAR	Yes	Yes	Yes
IND	Yes	Yes	Yes
AdjR^2	0.094	0.573	0.119
N	14309	14309	14309

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

As presented in Table 9, Column 1 indicates the inhibitory effect of conservatism on R&D manipulation. Column 2 demonstrates that accounting conservatism negatively relates to financial constraints. Financing includes debt financing and equity financing. Accounting conservatism not only reconciles the conflicts between insiders and outsiders but also improves the efficiency of debt contracts [70]. In addition, it can increase corporate value, enhance market trust, and ultimately reduce the cost of equity financing [71]. Therefore, accounting conservatism facilitates corporate finance. Column 3 shows that the impacts of financial constraints and accounting conservatism on R&D manipulation are both significant. Financial constraints partially play a mediating role in the conservatism–manipulation relationship. Accounting conservatism can, to some extent, effectively alleviate R&D manipulation by reducing financial constraints.

5.3. Accounting Conservatism, R&D Manipulation, and Corporate Innovation

The analysis in Section 4 has found the inhibitory effect of conservatism on R&D manipulation. How does this influence firm innovation? Although R&D manipulation helps to obtain policy preferences in the short term, owing to it actually damages R&D practices and competitive advantages in the long term. Does the governance effect of conservatism on manipulation improve R&D efficiency? In order to figure out the economic effect of the conservatism–manipulation relationship, this study measures firms' innovation efficiency (IE) as patent applications scaled by R&D expenditures in the last three years [72,73]. Based on the three-step test, Table 10 shows the results of the analysis.

Table 10. Results for the test of the mediating role of R&D manipulation.

Variables	(1)	(2)	(3)
	IE	**AB_RD**	**IE**
ACF	0.107 ***	−0.045 **	0.106 ***
	(3.103)	(−1.919)	(3.085)
AB_RD			−0.044 ***
			(−4.862)
_CONS	2.829 ***	0.523 *	2.852 ***
	(3.829)	(1.873)	(3.145)
CONTROLs	Yes	Yes	Yes
YEAR	Yes	Yes	Yes
IND	Yes	Yes	Yes
AdjR^2	0.051	0.109	0.053
N	6167	6167	6167

Note: * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$.

As can be seen in Table 10, the coefficient of accounting conservatism on firms' innovation efficiency in Column 1 is significantly positive. In other words, accounting conservatism can improve corporate innovation efficiency. The relationship between conservatism and R&D manipulation in Column 2 is negative, as discussed in the previous section. In Column 3, both accounting conservatism and R&D manipulation have a significant impact on innovation efficiency, implying that there is a partial mediating role of R&D manipulation between accounting conservatism and innovation efficiency. Enterprises with high accounting conservatism conduct fewer manipulations in R&D activities. Less R&D manipulation often indicates more efficient allocation of R&D expenditure or less self-interested behavior of executives, increasing R&D efficiency. Consequently, accounting conservatism may effectively improve corporate innovation efficiency by reducing R&D manipulation.

6. Discussion

With the growing demands for industrial upgrading and transformation in China against the backdrop of a declining economy, this paper explores the relationship between accounting conservatism and R&D manipulation. It demonstrates the intrinsic correlation between corporate governance, R&D investment, internal control, and tax policy.

Since accounting conservatism has been found to affect executives' incentives for innovative investment [22], we further discuss how accounting conservatism influences R&D investment manipulation. In contrast to previous research, our study includes both internal governance and external policies. One of our investigations suggests that the negative relationship between accounting conservatism and manipulation is mitigated by internal control. This is in accordance with earlier research in this area linking internal control weaknesses and inefficient investment [74]. Consistent with the literature [25], another one of our investigations also uncovers the motivation of R&D manipulation for tax incentives. However, this paper takes the risk of tax-related manipulation as well as the Chinese tax system into consideration. Despite the deception, tax subsidies and the potential tax transmission to non-manipulators encourage R&D manipulation.

In addition, we find that the inhibitory effect is more significant for R&D expensing. Expensing entails more real R&D investment than expected. Therefore accounting conservatism may effectively reduce R&D overinvestment, which is in agreement with recent findings [20]. The inhibitory effect is also significant for enterprises in the growth stage. On the one hand, for enterprises of this stage, R&D capability is positively related to innovation success [75]. On the other hand, young enterprises tend to build empire when they have promising development prospects. This paper figures out this dilemma and makes recommendations.

In the end, this paper examines the mediating effect of financial constraints and the economic consequences of the conservatism–manipulation relationship. Accounting conservatism reduces information asymmetries between insiders and outside capital providers and improves market reactions to the enterprise [33,34,67], which lowers the financing cost. With enough capital for further investment, there is no need for R&D manipulation to produce pseudo-innovation. Additionally, conservatism may improve investment efficiency by reducing manipulation in R&D practice. This seems to be consistent with earlier research [20,22].

This paper enriches the extant research by exploring the direction, lifecycle, and consequences of the conservatism–manipulation relationship as well as its moderating and mediating factors. There are some limits, nevertheless, that are proposed to be addressed later. The data are the first limit. The observation period of this paper is 2008–2019, without taking into account the impact of the latest two years. For one thing, in 2020–2021, the Chinese economy was under the shock caused by COVID-19. Production and transportation were nearly halted by the regulation, not to mention R&D activities. For another, some companies' operations were significantly impacted by COVID-19, and their financial reports have not been released yet. Therefore, subsequent research should put

more effort into data collection and consider the influence of a big shock such as COVID-19 using DID. The second limit is the influencing factors considered. The subject of this paper is the enterprise, and this paper just introduces corporate governance (G) and policy into analysis without other factors such as the environment, responsibility, etc. As sustainability management garners more attention from experts [76], ESG (Environmental, Social, and Governance) is being adopted to examine enterprises. In addition to corporate governance, enterprise performance is also related to climate [77] and social responsibility [78,79]. Thus, further studies will attempt to investigate R&D practices from other aspects of ESG (E and S). Identification of R&D manipulation is the third limit. Not all innovative practices are genuine because of R&D manipulation. The effectiveness of R&D investment depends on how to distinguish real innovative practices from manipulative investment. Therefore, future research should focus on the identification of pseudo-innovation (the degree and form of manipulation) and the impact of manipulative investment.

7. Conclusions and Suggestions

7.1. Conclusions

Robust development or innovative advancement is an unavoidable choice for enterprises in China. The impact of accounting conservatism on R&D manipulation is investigated in this paper, as well as the moderating role of internal control and tax enforcement. Moreover, further analyses, including the direction and periodicity of R&D manipulation, the mediating role of financial constraints, and the impact on innovation efficiency, are also conducted.

The conclusions are as follows. (1) Accounting conservatism has an inhibitory effect on R&D manipulation. Accounting conservatism is a governance mechanism inside the enterprise and an information transmission mechanism outside the enterprise. Therefore, the self-interested behaviors of executives are restrained, and information asymmetry is mitigated, which in the end reduces R&D manipulation. (2) Internal control and tax enforcement both play a moderating role in the conservatism–manipulation relationship. The negative effect of accounting conservatism on R&D manipulation is more significant when the quality of internal control is poor, and the intensity of tax enforcement is low. (3) The negative effect of accounting conservatism on R&D manipulation is more significant when actual R&D expenditures are higher than expected. In other words, accounting conservatism is beneficial in alleviating the expensing of R&D expenditure. Meanwhile, the negative effect is more significant for enterprises in the growth stage. (4) Financial constraints act as the influence path through which accounting conservatism inhibits R&D manipulation. The higher the level of accounting conservatism is, the lower the financial constraints enterprises face. As a result, it will be easier for enterprises to obtain R&D funding, and R&D will be less manipulated. (5) The governance effect of accounting conservatism on manipulation facilitates innovation improvement. Accounting conservatism reduces the inefficient allocation of R&D expenditures and discourages the self-interested behavior of executives, eventually increasing innovation efficiency.

7.2. Suggestions

This paper makes the following recommendations based on the previous findings.

From the perspective of enterprises, (1) accounting conservatism should be emphasized, and accounting policies should be applied scientifically. For one thing, high-level accounting conservatism is beneficial for inhibiting executives' manipulation in corporate decision making, which decreases operating risk. For another, accounting conservatism improves the quality of accounting information, which reduces financial costs. The financial constraints will be eased for better financing development potential. (2) The supervision of executives' decision making in R&D activities should be strengthened, including cost attribution, capitalization, and expensing of R&D expenditures. (3) The assessment mechanism for executives should be improved. Enterprises can not only incorporate the transformation

of R&D results and innovation efficiency into their assessment system but also prevent non-compliant behaviors of executives such as R&D manipulation.

From the perspective of the government, (1) R&D manipulation divides innovation activities into real innovation and pseudo-innovation, so the government cannot implement a one-size-fits-all policy for companies' innovation activities. The government could strengthen the effective identification of innovative activities. Real innovation should be encouraged and supported, while the supervision and review of pseudo-innovation should be strengthened. (2) Emphasize growing enterprises. These young firms create the majority of employment in China. To encourage innovation without initiating R&D manipulation, the authorities could fund the R&D of these firms and promote their governance mechanisms. (3) Improve preferential tax policy making. The tax credit serves as an incentive for R&D and a tax shelter for enterprises, making it a double-edged sword. In the context of establishing Golden Tax IV in China, it is important to make the most of the tax credit and avoid the negative effects.

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Appendix A

Table A1. All models in this paper.

Order	Models	Usage
1	$\frac{RD_{i,t}}{TA_{i,t-1}} = \alpha_0 + \frac{\alpha_1}{TA_{i,t-1}} + \alpha_2 MV_{i,t} + \alpha_3 TBQ_{i,t} + \alpha_4 \frac{INT_{i,t}}{TA_{i,t-1}} + \alpha_5 \frac{RD_{i,t-1}}{TA_{i,t-1}} + \varepsilon$	Estimating R&D manipulation
2	$NM\_RD_{i,t} = \hat{\alpha_0} + \frac{\hat{\alpha_1}}{TA_{i,t-1}} + \hat{\alpha_2} MV_{i,t} + \hat{\alpha_3} TBQ_{i,t} + \hat{\alpha_4} \frac{INT_{i,t}}{TA_{i,t-1}} + \hat{\alpha_5} \frac{RD_{i,t-1}}{TA_{i,t-1}}$	
3	$AB\_RD_{i,t} = \frac{RD_{i,t}}{TA_{i,t-1}} - NM\_RD_{i,t}$	
4	$ACC_{i,t} = \beta_0 + \beta_1 DR_{i,t} + \beta_2 CFO_{i,t} + \beta_3 DR_{i,t} \times CFO_{i,t} + \mu$	Estimating ACF
5	$\frac{T_{i,t}}{GDP_{i,t}} = \alpha_0 + \alpha_1 \frac{IND1_{i,t}}{GDP_{i,t}} + \alpha_2 \frac{IND2_{i,t}}{GDP_{i,t}} + \alpha_3 \frac{OPEN_{i,t}}{GDP_{i,t}} + \varepsilon$	Estimating Tax enforcement
6	$\left(\frac{\hat{T_{i,t}}}{GDP_{i,t}}\right) = \hat{\alpha_0} + \hat{\alpha_1} \frac{IND1_{i,t}}{GDP_{i,t}} + \hat{\alpha_2} \frac{IND2_{i,t}}{GDP_{i,t}} + \hat{\alpha_3} \frac{OPEN_{i,t}}{GDP_{i,t}}$	
7	$TE = \frac{T_{i,t}}{GDP_{i,t}} / \left(\frac{\hat{T_{i,t}}}{GDP_{i,t}}\right)$	
8	$AB\_RD_{i,t} = \alpha_0 + \alpha_1 ACF_{i,t} + SIZE + LEV + TBQ + BOARD + DUL + SHR + AGE + BI + BIG4 + RDI + COMP + ROA + SOE + \sum YEAR + \sum IND + \varepsilon$	Analyzing the impact of accounting conservatism on R&D manipulation
9	$AB\_RD_{i,t} = \alpha_0 + \alpha_1 ACF_{i,t} + \alpha_2 ICQ_{i,t} + \alpha_3 ICQ_{i,t} \times ACF_{i,t} + SIZE + LEV + TBQ + BOARD + DUL + SHR + AGE + BI + BIG4 + RDI + COMP + ROA + SOE + \sum YEAR + \sum IND + \varepsilon$	

Table A1. *Cont.*

Order	Models	Usage
10	$AB\_RD_{i,t} = \alpha_0 + \alpha_1 ACF_{i,t} + \alpha_2 TE_{i,t} + \alpha_3 TE_{i,t} \times ACF_{i,t} + SIZE + LEV + TBQ + BOARD + DUL + SHR + AGE + BI + BIG4 + RDI + COMP + ROA + SOE + \sum YEAR + \sum IND + \varepsilon$	
11	$\frac{EPS_{i,t}}{P_{i,t-1}} = \beta_1 + \beta_2 D_{i,t} + \beta_3 R_{i,t} + \beta_4 D_{i,t} \times R_{i,t} + \varepsilon$	Estimating C_SCORE
12	$G\_SCORE = \beta_3 = \mu_1 + \mu_2 SIZE_{i,t} + \mu_3 LEV_{i,t} + \mu_4 MB_{i,t}$	
13	$C\_SCORE = \beta_4 = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 LEV_{i,t} + \lambda_4 MB_{i,t}$	

Note: All models are listed in order of appearance in this paper.

Appendix B

Table A2. Definition and measurement of all variables

Symbol	Meaning	Measurement	Source
RD	Research & development	R&D expenditure	C
TA	Total assets	Total assets	C
MV	Market value	Ln(Market value)	C
TBQ	Tobin Q	Total market value/total assets	C
INT	Operating profit	Operating profit	C
NM_RD	Normal R&D	Calculated from model 2 based on the coefficients of model 1	M2
AB_RD	R&D manipulation	|Abnormal R&D index| × 100	M3
ACC	Total accruals	Net profit+ finance costs-net cash flow from operating activities	C
CFO	Cash flow	Net cash flows from operating flow	C
DR	Dummy variable	1 if CFO < 0 and 0 otherwise	C
ACF	Accounting conservatism	β_3, the coefficient of $DR \times CFO$ in model 4	M4
ICQ	Internal control quality	Ln(internal control index)	DIB
TE	Tax enforcement	Real tax collection/expected tax collection	M7
T	Tax revenue	Tax revenue of each region	E
IND1	The primary industry	The output value of the primary industry in each region	E
IND2	The secondary industry	The output value of the secondary industry in each region	E
OPEN	Openness	The total import and export value of each region	E
GDP	Gross domestic product	The gross domestic product of each region	E
SIZE	Enterprise size	Ln (total assets)	C
LEV	Leverage	Debt/total assets	C
TBQ	Tobin Q	Market value/total assets	C
BOARD	Size of board	Ln (the population of the board)	C
DUL	Duality	1 if CEO is also the chairperson of the board of directors and 0 otherwise	C
SHR	Ownership concentration	Proportion of top-1 shareholder' holdings	C
AGE	Enterprise age	Ln (the enterprise's age at listing)	C
BI	Board independence	Independent directors/all directors	C

Table A2. *Cont.*

Symbol	Meaning	Measurement	Source
BIG4	Audit reputation	1 if an enterprise's auditor is one of the big four auditing firms and 0 otherwise	C
RDI	R&D intensity	R&D investment/operating income	C
COMP	Compensation	Ln (sum of the top 3 highest executive compensation)	C
ROA	Return of total assets	Return/total assets	C
SOE	Ownership type	1 for state-owned enterprise and 0 otherwise	W
IND	Industry	Controlling for industry fixed effects, manufacturing are classified by secondary industry codes, and other industries are classified by primary industry codes	W
YEAR	Year	Controlling for year fixed effects	C
EPS	Earnings per share	Earnings per share	C
P	Stock price	The stock price at the end of the year	C
D	Dummy variable	1 if R < 0 and 0 otherwise	C
R	Return	Stock returns—market returns	C
MB	Book-to-market ratio	Market value/book value	C
G_SCORE	Reaction to 'good news'	β_3, the coefficient of R in model 11	M11
C_SCORE	Accounting conservatism	β_4, the coefficient of $D \times R$ in model 11	M11

Note: 1. All variables are listed in order of appearance in this paper. 2. In column 4: M means model, e.g., M1 is Model 1 of Appendix A; C means CSMAR database; W means Wind database; E means EPSDATA platform; DIB means DIB internal control index.

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