Empirical Study on the Influence of Tax Incentives, Research and Development Investment on Enterprise Value

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Abstract—China has implemented the innovation-driven development strategy through preferential tax policies to encourage enterprises to carry out research and innovation and thus enhance enterprise value. This paper takes 336 GEM listed companies from 2010 to 2021 as the research sample, and uses Stata15 software to construct multiple regression models to empirically test whether tax incentives and R&D investment affect enterprise value. The empirical results show that tax incentives are positively correlated with R&D investment. R&D investment has a positive incentive effect and plays a strong regulating role on enterprise value, in the meanwhile, it has three periods of lag. Further research shows that the more tax incentives enterprises enjoy, the more obvious is the moderating effect of R&D investment on enterprise value. It is suggested that the government give more tax incentives to GEM listed enterprises, give tax rebates and reduce the tax burden at the same time, in order to better play the incentive effect of tax incentives on R&D investment. Meanwhile, the government should subsidize R&D funds and provide preferential interest rates on loans for R&D activities, to improve their technological innovation ability and enterprise value.

Keyword—Multiple regression analysis; Correlation analy-sis; tax rebates; technological innovation

1. Introduction

In order to better implement the "Guidelines on Preferential Tax Policies for Mass Entrepreneurship and Innovation", bearing in mind that "promoting mass entrepreneurship and innovation is a source of motivation for development, as well as a way to enrich the people, a plan for fairness and a strategy for strengthening the country", and to further implement the innovation-driven development strategy The government should play a macro-controlling role as the "visible hand" through tax incentives to motivate enterprises to improve their independent research and development, enhance their technological innovation capability and strengthen their comprehensive national power. This paper aims to further clarify the incentive effect of tax incentives and the regulation effect of R&D investment by analyzing whether tax incentives and R&D investment can enhance enterprise value using the data of listed companies in China GEM from 2010 to 2021 as a research sample, which is of great practical significance.

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First, regarding the research on whether tax incentives affect R&D investment, some scholars believe that there is a positive relationship between both. Czarnitzki (2005)[1], by comparing eastern and western Germany, concluded that fiscal subsidies in fiscal policy can significantly promote enterprise R&D innovation; Through an empirical study, Tang Yingmei (2019)[2] found that tax incentives stimulate enterprises to invest in R&D by reducing R&D costs, and that tax incentives have a significant incentive effect in regions with developed market economies. Through an empirical study of A-share listed companies in Shanghai and Shenzhen from 2007 to 2017, Wei Shuyu (2021)[3] concluded that tax incentives and fiscal subsidies can significantly increase the enthusiasm of enterprises to invest in R&D by providing financial support. At the same time, some scholars hold the opposite view. Lokshin (2012)[4] used the data of Dutch companies from 1996 to 2004 as a sample and concluded that tax incentives do not significantly promote enterprises to invest in R&D under the premise of market failure; By studying an empirical sample of high-tech enterprises enjoying 15% tax incentives, Han Fengqin (2021) [5] found that enjoying tax incentives did not significantly and positively motivate enterprises to engage in technological innovation.

Second, regarding the research on whether R&D investment affects enterprise value, most scholars believe that there is a positive correlation between both of them. Patricia (2015)[6] believed that when companies invest in R&D, they could improve their independent research capabilities, but also improve product production efficiency, reduce production costs and increase enterprise value; Xia Juan (2019)[7] concluded that technology R&D investment provided a positive incentive for manufacturing firms to increase their value, and that financial innovation could significantly enhance the correlation between the two; Using a sample of technology board listed companies from 2015-2019, Tang Shaoqing (2021)[8] found a significant positive correlation between R&D investment and enterprise growth. Some scholars believe that there is a negative or non-linear relationship between R&D investment and enterprise value. Mank (2001) [9] concluded that there is a significant negative relationship between R&D investment intensity and real shareholder return in the computer industry during the 1-year and 5-year periods; Taking the empirical analysis of the New Third Board listed companies as an example, Jiang Ting (2019)[10] argued that the current R&D investment significantly curbed enterprise growth and the equity concentration significantly weakened its negative correlation; Wu Zhiyong (2020)[11] took a sample of manufacturing listed companies with foreign sales revenue in China from 2012-2018, and took the degree of internationalization as the threshold, and concluded that there was a significant double threshold effect between R&D investment and enterprise value through a threshold model, and the two had a U-shaped non-linear relationship.

Finally, regarding the research on whether tax incentives and R&D investment affect enterprise value, most scholars believe that there is a positive relationship. Feng Tuozhu (2019)[12] conducted a study on tax incentives with income tax and turnover tax incentives, and concluded that tax incentives and R&D investment significantly and positively stimulate the increase of enterprise performance, and R&D investment has a strong crowding-in effect when tax incentives promote the increase of enterprise performance; Bu Hua (2019)[13] found that government subsidies, R&D investment and enterprise value all have a significant positive relationship with lagging, and government subsidies play a significant positive moderating effect in the process of R&D investment positively stimulating enterprise value increase.

However, there are shortcomings in the existing studies, and the relationship between tax incentives, R&D investment and enterprise value is not studied with the GEM, which plays a

significant role in national development. Based on this, the empirical study on the relationship between these three factors is of certain practical significance.

2. Research Hypothesis

2.1 Tax tax incentives and R&D investment

Most of the R&D achievements of GEM listed enterprises are intangible assets. Due to the unsoundness of relevant laws and regulations to protect the property rights achievements of intangible assets and the weak awareness of property rights of enterprises at the early stage of listing, the property rights achievements are easy to be copied and it is difficult for the R&D achievements to bring expected income to the enterprises, therefore, it is necessary to enhance the enthusiasm of enterprises' R&D expenditure by virtue of tax preferential policies. Secondly, the tax incentives given by the government to enterprises have a good signaling effect. Enterprises enjoying tax incentives help to reduce the risk of R&D, improve the success rate of transformation of scientific and technological innovation results, and convey to the society the favorable message of strong R&D capability of enterprises.

The paper proposes hypothesis 1: There is a positive relationship between tax incentives and R&D investment.

2.2 R&D investment and enterprise value

R&D investment can enhance the added value of enterprise products through technological innovation and improve the competitive advantage of products. The improvement of technological innovation ability is conducive to the increase of market share, which in turn is beneficial to the increase of enterprise value. Through R&D achievements, enterprises convey to the society the favorable message that they are innovative, and a good enterprise reputation is conducive to introducing investment, increasing stakeholders' trust in the enterprise, and enhancing enterprise value.

The paper proposes hypothesis 2: There is a positive relationship between R&D investment and enterprise value.

2.3 Tax incentives, R&D investment and enterp-rise value

Innovation is the core driving force of GEM-listed enterprises. First of all, the tax incentive policy stimulates the enthusiasm of enterprises to invest in R&D by increasing the supply of funds and reducing the tax burden of enterprises, so as to enhance the core competitiveness of enterprises with R&D innovation and finally increase the enterprise value by remaining funds for R&D investment. Because of the uncertainty of R&D investment, the tax rebate policy can effectively compensate the economic loss caused by the failure of R&D and enhance the value of enterprises, while the improvement of enterprise value increases the operating income of enterprises, and the increase of surplus funds will stimulate enterprises to increase R&D investment to enhance the level of scientific and technological innovation and improve enterprise value, forming a virtuous drive and cycle.

In view of this, this paper proposes hypothesis 3: There is a positive relationship between tax incentives and R&D investment on enterprise value.

3. Research Design

3.1 Sample selection and data source

This paper takes GEM listed enterprises from 2010-2021 as the research object for three reasons: (1) GEM listed companies occupy an important position in China's science and technology innovation system, and China implements various tax incentives to motivate their R&D investment, which is conducive to promoting the implementation of China's innovation-driven development strategy. (2) GEM-listed enterprises have high growth and are in the stage of rapid development, and R&D investment is an important medium that plays an irreplaceable and important role in enhancing enterprise value. (3) GEM-listed enterprises actively use tax incentives to facilitate surplus funds for R&D investment, increase technological innovation and promote industrial structure optimization, adjustment and upgrading.

In order to avoid the influence of extreme values, this paper excludes the ST and ST* enterprises from the obtained data, and a total of 336 GEM listed enterprises meeting the requirements of the study are screened, with a total sample of 4032. Among them, the sample data are obtained from CSMAR database, and the empirical analysis uses Stata15.

3.2 Variable definition

3.2.1 Explained variable

Since most of the GEM listed enterprises have passed the start-up period and entered the rapid development stage, enterprise profitability plays a representative role in the measurement of enterprise value, therefore, the value of net profit divided by net assets is selected as the explanatory variable enterprise value (ROE) in this paper.

3.2.2 Explanatory variable

Drawing on Liu Guangqiang's (2016)[14] study, this paper defines tax incentives as PT = various tax rebates received/ (various tax rebates received + various taxes paid). To facilitate the comparison of R&D investment status among enterprises of different sizes, the ratio of R&D expenditure to total assets is selected as the explanatory variable R&D investment intensity (RD) in this paper.

3.2.3 Control variable

In this paper, growth of enterprise (GROW), gearing ratio (DAR), and size of enterprise (SIZE), which have significant impact on enterprise value, are selected as control variables, as shown in Table 1.

Table 1. Variable definitions

Type	Name	Symbol	Specific Definition
Explained variable	enterprise Value	ROE	Net Income / Net Assets
Explanatory variable	Tax incentives	PT	Various tax refunds received / (various tax refunds received + various taxes paid)

	R&D investment	RD	R&D expenditure/total assets
	Tax incentives and R&D investment interaction items	PT×RD	Various tax refunds received / (various tax refunds received + various taxes paid)* (R&D expenditure/total assets)
Control variable	Business Growth	GROW	Operating income growth rate
	Gearing ratio	DAR	Total liabilities / total assets
	Enterprise size	SIZE	Logarithm of total assets

3.3 Model design

This paper constructs model (1) to verify the relationship between tax incentives and R&D investment. If the coefficient of tax incentives is positive, then it proves that the enterprises enjoy tax incentives are conducive to increasing R&D investment with surplus funds.

$$RD = \alpha + \beta_1 PT + \beta_2 GROW + \beta_3 DAR + \beta_4 SIZE + \varepsilon \quad (1)$$

This paper constructs model (2) to verify the relationship between R&D investment and enterprise value, and if the coefficient is positive, it indicates that the firm makes R&D investment is beneficial to enterprise value.

$$ROE = \alpha + \beta_1 RD + \beta_2 GROW + \beta_3 DAR + \beta_4 SIZE + \varepsilon \quad (2)$$

This paper adds the moderating variable of R&D investment to construct model (3) to verify whether R&D investment plays a moderating role, and if the coefficient of the interaction term is positive, it means that firms' use of tax incentives for R&D investment is beneficial to the enhancement of enterprise value.

$$ROE = \alpha + \beta_1 PT + \beta_2 RD + \beta_3 PT \times RD + \beta_4 GROW + \beta_5 DAR + \beta_6 SIZE + \varepsilon (3)$$

α represents the constant term; $\beta_1 - \beta_6$represents the regression coefficient; ε represents the residual term.

4. Empirical Results and Analysis

4.1 Descriptive statistical analysis

Table 2. Descriptive statistics of variables

Variable	Total	Average	Standard deviation	Minimum value	Maximum value
ROE	4,032	0.0469	0.0727	-0.202	0.218
PT	3,046	0.197	0.180	5.60	0.675
RD	3,693	0.0527	0.0920	0.000590	0.459
PT × RD	2,983	0.0114	0.0255	2.96	0.310
GROW	3,724	0.368	0.604	-0.434	2.418

DAR	4,032	0.304	0.175	0.0462	0.684
SIZE	3,768	21.40	0.852	19.89	23.32

As seen in Table 2, the standard deviation of ROE is 0.0727, indicating that the difference between the enterprise values of the sample is not large; the standard deviation of PT is 0.180, indicating that the tax benefits enjoyed by the sample enterprises are relatively consistent, and the stability of the selected variables is good; the mean value of RD of the sample enterprises is 0.0527,indicating that the overall R&D investment of the sample enterprises is strong, while the difference between the great value and the very small value is 1000 times, indicating a large gap in the strength of R&D investment by the sample enterprises. The mean value of DAR is 0.304, and the balance sheet ratio of enterprises is generally stable between 0.4 and 0.6, which indicates that the R&D results of the sample enterprises are mainly intangible assets. The mean value of SIZE is 21.4, which indicates that the overall asset level of the sample enterprises is high.

4.2 Correlation analysis

Table 3. Correlation analysis

Variable	ROE	PT	RD	PTxRD	GROW	DAR	SIZE
ROE	1						
PT	-0.094***	1					
RD	-0.013	0.050***	1				
PT xRD	-0.087***	0.386***	0.695***	1			
GROW	-0.0070	-0.041**	0.0100	-0.006	1		
DAR	-0.265***	0.074***	0.115***	0.084***	0.0160	1	
SIZE	-0.135***	0.035**	0.387***	0.283***	-0.001	0.487***	1

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

From the correlation analysis in Table 3, it can be seen that PT has a significant positive correlation to RD at 1% level, which tentatively confirms hypothesis 1; PT × RD is not positively correlated for ROE may be affected by lagging; for the control variables, DAR and SIZE have a significant correlation to ROE, and there is no multicollinearity in the above variables.

4.3 Regression results and analysis

The regression results of model (1)-model (3), the F-statistics of the three models are 103.4, 99.03 and 64.18 respectively, indicating that the models are valid overall; R^2 is 0.157, 0.122 and 0.0177 respectively, indicating that the independent variables selected for the sample are more appropriate.

Model (1) has a significant positive relationship between PT and RD at the 1% level, with a regression coefficient of 0.022, for every 1% increase in the government's tax incentive subsidies, enterprises' R&D investment strength is enhanced by 2.2%, and hypothesis 1 is tested.

Although there is a positive relationship between RD and ROE in model (2), it is not significant. Considering that it may be influenced by the lagging nature of R&D output due to excessive R&D by enterprises, this paper builds model (4) to further verify the positive incentive effect of R&D investment on enterprise value with a lag of three periods.

$$L3.\,ROE = \alpha + \beta_1 RD + \beta_2 GROW + \beta_3 DAR + \beta_4 SIZE + \varepsilon \quad (4)$$

Table 4. Model regression results

Variable	(1)	(2)	(3)	(4)	(5)
	RD	ROE	ROE	L3.ROE	L3.ROE
PT	0.022 ***		-0.043 ***		-0.010
	(3.28)		(-4.08)		(-0.86)
RD		0.008	-0.053*	0.033**	-0.028
		(0.60)	(-1.90)	(2.37)	(-0.93)
PT × RD			0.071		0.151*
			(0.83)		(1.70)
GROW	0.002	0.001	0.010 ***	0.001	0.000
	(0.88)	(0.32)	(4.33)	(0.28)	(0.04)
DAR	-0.055 ***	-0.141 ***	-0.154 ***	-0.114 ***	-0.109 ***
	(-5.82)	(-16.64)	(-13.89)	(-13.94)	(-9.00)
SIZE	0.048 ***	0.006 ***	-0.001	0.001	-0.022 ***
	(19.19)	(3.31)	(-0.54)	(0.53)	(-8.27)
Constant	-0.961 ***	-0.043	0.117 **	0.072 *	0.577 ***
	(-18.84)	(-1.22)	(2.39)	(1.85)	(10.24)
Observations	3,648	3,650	2,955	2,460	2,460
R-squared	0.158	0.123	0.128	0.103	0.124
adj_R^2	0.157	0.122	0.0177	0.101	-0.0117
F	103.4	99.03	64.18	48.25	50.26

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

Model (4), with a three-period lag of ROE, shows a significant positive correlation between RD and ROE at the 5% level, testing hypothesis 2. This indicates that due to the complexity of the R&D investment process and the long R&D cycle of GEM-listed enterprises, the results of R&D are not immediately available in the short term and can be put on the market to generate revenue, there is a time gap between R&D investment and the output of R&D results.

Model (3) shows a positive but insignificant relationship between PT × RD and ROE, probably due to the complexity and variability of the process of enterprises enjoying tax incentives to receive financial subsidies, applying them to R&D inputs and finally getting output results to get revenue, and the endless risks of R&D. Also, due to the results of model (4), it can be concluded that due to the existence of lags, R&D investments curb the increase of enterprise value in the current period, so this paper establishes model (5), which also lags the enterprise value by three periods for regression analysis.

$$L3.\,ROE = \alpha + \beta_1 PT + \beta_2 RD + \beta_3 PT \times RD + \beta_4 GROW + \beta_5 DAR + \beta_6 SIZE + \varepsilon \quad (5)$$

The regression coefficient of model (5), which lags enterprise value by three periods, the regression coefficient for PT × RD is significantly positive at the 10% level, indicating that R&D investment plays a significant moderating role in the promotion of firm value by tax incentives, supporting hypothesis 3.

Among the control variables, GROW is positively correlated with ROE, indicating that there is a positive promotion effect of enterprise growth and enterprise value; DAR is significantly negatively correlated with ROE at the 1% level, indicating that if an enterprise has a high proportion of debt capital it will increase its financial risk accordingly, which may bring about the problem of cash flow shortage and aggravate the financing cost of the enterprise, and if the enterprise fails to pay off its debt in time due to shortage of capital chain, it may go bankrupt. The significant positive correlation between SIZE and ROE indicates that the larger the size of an enterprise, the more beneficial it is to the enhancement of enterprise value.

4.4 Further research

To further test hypotheses 1-3, this paper divided the sample enterprises into two groups of low tax incentive enterprises and high tax incentive enterprises according to the mean value of tax incentive of 0.197414422 (see Tables 5 and 6). The specific classification criteria are: when the tax concession is less than the mean value, they are low tax concession enterprises, with a total of 1,740 sample enterprises; when the tax concession is greater than the mean value, they are high tax concession enterprises, with a total of 2,292 sample enterprises.

Table 5. Regression results by group

Variable	low tax incentive enterprises		high tax incentive enterprises	
	ROE	L3.ROE	ROE	L3.ROE
PT	-0.027	-0.026	-0.038**	-0.065***
	(-0.97)	(-0.74)	(-2.57)	(-3.33)
RD	0.035	0.032	-0.037	-0.120**
	(1.41)	(1.42)	(-0.65)	(-1.98)
PT × RD	-0.278	-0.260	0.086	0.291*
	(-1.14)	(-1.10)	(0.54)	(1.70)
GROW	-0.000	-0.005*	0.004	0.002
	(-0.04)	(-1.66)	(1.51)	(0.53)
DAR	-0.147***	-0.106***	-0.110***	-0.097***
	(-11.83)	(-10.38)	(-7.32)	(-6.01)
SIZE	0.005*	0.012***	0.002	-0.004
	(1.89)	(4.29)	(0.73)	(-1.31)
Constant	-0.020	-0.164***	0.032	0.201***
	(-0.38)	(-2.90)	(0.50)	(2.79)
Observations	1,683	859	1,272	874
R-squared	0.139	0.128	0.097	0.103
adj_R^2	0.136	0.122	0.0923	0.0963
F	39.99	19.99	23.21	15.74

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

The regression results show that, with a three-period lag of ROE, The regression coefficient of the interaction term between tax incentives and R&D investment, PT × RDis insignificant in low tax incentive enterprises and the regression coefficient of PT × RD in high tax incentive enterprises is 0.291, which is significantly positively related to ROE at the 10% level, and the

coefficient is larger than the absolute value of the coefficient in the case of low tax incentive firms and the full sample. Therefore, with higher tax incentives from the government, R&D investment is more likely to stimulate companies to increase their enterprise value, and Hypothesis 3 is further tested.

4.5 E.Robustness test

The value of net profit divided by total assets, ROA, is used instead of ROE for the robustness test and the main regression results after replacing the variables are consistent with the previous section (see Table 6).

Table 6. Robustness test results

Variable	(1)	(2)	(3)	(4)	(5)
	RD	ROA	ROA	L3.ROA	L3.ROA
PT	0.033***		-0.048***		-0.031***
	(4.58)		(-5.97)		(-3.34)
RD		0.014	-0.017	0.024***	-0.013
		(1.35)	(-0.88)	(2.90)	(-0.54)
PT × RD			0.022		0.221**
			(0.23)		(2.00)
GROW	-0.000	-0.000	0.008***	0.001	0.003
	(-0.21)	(-0.14)	(4.88)	(0.28)	(1.59)
DAR	-0.053***	-0.118***	-0.135***	-0.114***	-0.126***
	(-6.20)	(-18.58)	(-17.50)	(-13.94)	(-13.46)
SIZE	0.049***	-0.005***	-0.004**	0.001	-0.021***
	(21.41)	(-3.54)	(-2.21)	(0.53)	(-10.46)
Constant	-0.991***	0.217***	0.167***	0.072*	0.554***
	(-20.96)	(7.05)	(4.87)	(1.85)	(13.40)
Observations	4,534	4,537	4,102	3,780	4,102
R-squared	0.161	0.148	0.146	0.127	0.157
adj_R^2	0.161	0.147	0.0488	0.126	0.0499
F	124.5	159.5	115.8	131.4	112.9

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

5. Research conclusions and recommendations

Tax incentives to promote enterprise investment in R&D. The government can give a certain amount of tax rebate while reducing the tax burden of enterprises to better play the incentive effect of tax concessions on R&D investment. However, enterprises may have higher R&D risks and higher sunk costs due to R&D failures. Therefore, the national taxation authorities can introduce third-party tax-related professional service institutions as references through government purchase of services bidding when conducting tax incentive audits, forming a system of mutual supervision and control among taxpaying enterprises, tax-related professional service institutions and taxation authorities to further ensure the objectivity and fairness of enterprises enjoying tax incentives. At the same time, in order to encourage enterprises to pay taxes more

reasonably, the degree of information disclosure can be further increased in the future, and the details of tax incentives enjoyed by enterprises can be disclosed in more detail to enhance their tax credit.

Although R&D investment is conducive to promoting the enhancement of enterprise value, it has a certain lagging effect. Therefore, the government should increase its loan support for R&D investment in GEM-listed enterprises, grant preferential interest rates on loans, increase the amount of interest-free loans for enterprises and extend the interest-free period for loans to enterprises, so as to reduce the risks of R&D, lower the R&D costs of enterprises, stimulate the momentum of technological innovation of enterprises, promote the stable growth of enterprise performance, and in turn promote the enhancement of enterprise value.

At the same time, the government should improve the laws and regulations related to intellectual property rights, strengthen the protection of enterprises' R&D achievements and crack down on theft of R&D achievements.

R&D investment can significantly regulate the positive relationship between tax incentives and enterprise value, but with a certain lag. For GEM-listed enterprises, they should give full play to maximize the value of tax rebates brought about by tax incentives, improve the efficiency of the use of surplus funds, maximize the value of surplus funds and form a virtuous drive and cycle of tax incentives, R&D investment and enterprise value.

The stronger the tax incentives enjoyed by enterprises, the more obvious the incentive effect of R&D investment on enterprise value. The general enterprise's R&D expenses can enjoy pre-tax deduction while adding 75% or 100% deduction. Most GEM-listed enterprises are manufacturing and high-tech enterprises, which can enjoy the policy of adding 100% deduction for R&D expenses. The enhanced effect of pre-tax deduction for R&D expenses enables enterprises to enjoy more tax benefits and have more after-tax profits to enhance their corporate value. The government should focus on giving more tax breaks and tax rebates to enterprises enjoying tax concessions below the industry average, and implement policies to stimulate their motivation to increase R&D investment, improve their science and technology innovation, and enhance their enterprise value.

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References

[1] Czarnitzki D. (2005) The Extent and Evolution of Productivity Deficiency in Eastern Germany [J]. Journal of Productivity Analy-sis,24(2):211-231.

[2] Tang Yingmei, Xie Meng. (2019) Tax incentives, product market competition and firm innovation -- an example of technology-intensive industries [J]. Friends of Accounting, (19):122-127.

[3] Wei Shuyu, Xiao Peng. (2021) Tax incentives, financial subsidies and enterprise R&D investment--an empirical analysis based on A-share listed companies in Shanghai and Shenzhen [J]. Taxation Research, (05):40-46.

[4] Lokshin B, Mohnen P. (2012) How effective are level-based R&D tax credits? Evidence from the Netherlands [J]. Applied Economics, 44(12):1527-1538.

[5] Han Fengqin, Chen Yaping. (2021) Do tax incentives really promote corporate technological innovation? -- Evidence from 15% tax incen-tives for high-tech enterprises [J]. China Soft Science, (11):19-28.
[6] Patricia L, Christianlb, Antoines, et al. (2015) The rate and mot-ives of the internationalization of large firm R&D (1994-2005): Towards a turning point? [J]. Research Policy,44(3):765-776.
[7] Xia Juan. (2019) Financial innovation, technology R&D investment and firm value [J]. Finance and Accounting Newsletter, (18):78-81.
[8] Tang Shaoqing, Zhan Xiaoming, Li Junlin et al. (2021) A study on the relationship between R&D investment and firm growth of listed companies in the technology sector[J]. China Soft Science, (S1):58-67.
[9] Mank D A, Nystrom H E. (2001) Decreasing returns to shareholders from R&D spending in the computer industry [J]. Engineering Management Journal, 13(3):3-8.
[10] Jiang Ting, Zhang Baoshuai. (2019) R&D investment, equity str-ucture and firm growth--an empirical study based on New Third Board-listed companies [J]. Financial Theory and Practice, (04):102-109.
[11] Wu ZhiYong, Wang Zeren, Ma Yonghong. (2020) Analysis of t-he threshold effect of R&D investment, internationalization degr-ee and manufacturing firm value [J]. Science and Technology Pr-ogress and Countermeasures, 37(14):94-101.
[12] Feng Taozhu, Chen Yanyuan, Zhang Yang. (2019) Research on the impact of tax incentives, R&D investment on firm performance an empirical study based on the system-GMM approach [J]. Friends of Accounting, (19):116-121.
[13] Bu Hua, Song Jianhua. (2019) Government grants, R&D investment and enterprise value-A per-spective on the electric power industry [J]. Friends of Accounting, (08):36-40.
[14] Liu Guangqiang. (2016) Analysis of the incentive effect of tax incentives and financial subsidies policy--an empirical study based on the perspective of information asymmetry theory [J]. Management World, (10):62-71.