



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

# The Relationship between Government Subsidies and Research & Development Investment of Chinese Agricultural Listed Companies

Xiaomin HAO\*, Chengxing MAO

College of Economics and Management, Huazhong Agricultural University, Wuhan 430070, China

**Abstract** Based on the background of China's emerging and transitional market, government subsidies to enterprises are regarded as a "helping hand" of promoting economic structural adjustment. In this paper, using China's A-share agricultural listed companies from 2010 to 2015 as research samples, we discuss the influence of government subsidies on research and development (hereinafter referred to as R & D) investment, and the difference in the relationships between the two from the perspective of different nature of property rights. The results show that, on the whole, the increase in government subsidies does not promote the intensity of R & D investment of agricultural listed companies. And after distinguishing the nature of property rights, the results show that state-owned enterprises can get more government subsidies than private enterprises, and the increase in government subsidies boosts the increase in R & D investment in private enterprises, but there is a negative correlation between government subsidies and R & D investment of state-owned enterprises. This conclusion can broaden the research perspective of the influence factors of corporate R & D investment, and it is of practical significance to further clarify the role of government subsidies in R & D investment decisions of enterprises with different nature of property rights.

**Key words** Government subsidies, Nature of property rights, R & D investment, Agricultural listed companies

## 1 Introduction

Agriculture is the most important task of governing the country and ensuring national security, so its development plays a crucial role in China's economic development and social stability. As the enterprise organizations on behalf of China's agricultural advanced productive forces currently, agricultural listed companies are the main leaders of agricultural economy, playing an indispensable role in the development of agriculture. Their good development not only facilitates the industrialization of agriculture, but also helps to solve "Three Rural Issues". Under the background of the implementation of innovation-driven development strategy, the scientific and technological innovation of agriculture is the need to realize the modernization of agriculture. Therefore, to find the factors that promote or hinder the R & D investment of agricultural listed companies will be beneficial to enhance their core competitiveness and sustainable development<sup>[1]</sup>, and also help to achieve the objectives of the supply side structural reform on agriculture proposed by the government in the 2017 Central Document No. 1. The existing literature on China's agricultural listed companies mainly focus on the research of their overall development, capital structure, investment and financing behavior, corporate value and performance. In terms of R & D investment, as with other industries, agricultural listed companies are also faced with strong financing constraints, while the government always provides more help and support for the field of agriculture. Therefore, for agricultural listed companies, government subsidies, to a certain extent, alleviate the overall financing constraints of them, as well as the financing constraints encountered in R & D investment. Although some

of the existing studies initially explored the relationship between government subsidies and R & D investment of enterprises, but a consistent conclusion has not yet been reached. In view of this, combined with China's special institutional background, this paper further distinguishes the nature of the property rights of enterprises, in order to be able to further understand the relationship between government subsidies and R & D investment of enterprises. The choice of the nature of property rights as the perspective is inspired by the research of SHEN XH (2015)<sup>[2]</sup>, which explores the debt financing effect of government subsidies. The results show that the positive signal released by government subsidies can increase the scale of bank credit funds of enterprises, and this effect is more significant in private enterprises; it can also reduce the cost of credit financing, and this effect is more significant in state-owned enterprises. It can be found that the signal released by government subsidies does not bring about the same economic consequences in different nature of property rights. Therefore, this paper deduces that enterprises with different nature of property rights may also have differences in the use of government subsidies. So what impact does government subsidies have on the R & D investment of China's agricultural listed companies? And does this impact differ on companies with different nature of property rights? This paper explores these two issues. Through empirical research, it is found that: (i) On the whole, the increase in government subsidies did not promote the increase in the intensity of R & D investment of China's agricultural listed companies; (ii) State-owned enterprises are more likely to receive government subsidies than private enterprises. (iii) The increase in government subsidies has contributed to the increase in R & D investment in private enterprises, but has not had a positive impact on R & D investment in state-owned enterprises. The possible innovation points of

this paper are as follows: (i) Different from the existing overall research on the industry, this paper chooses the sample of agricultural listed companies to explore the impact of government subsidies on R & D investment, which can provide empirical evidence for the government's precise policy objectives on the structural reform of agricultural supply side; (ii) Further distinguishing the difference in the nature of property rights will help to deepen the understanding of the impact of government subsidies on R & D investment in agricultural listed companies, expand the perspective about the impact of government subsidies on R & D investment, and enrich the literature in related fields.

## 2 Literature review and research hypotheses

### 2.1 Government subsidies and R & D investment of companies

Previous studies have shown that R & D investment in China's listed companies is restricted by financing constraints (LU X, *et al.*, 2013<sup>[3]</sup>; GU Q and ZHAI SP, 2014<sup>[4]</sup>; XIE JZ, *et al.*, 2014<sup>[5]</sup>). So when an enterprise is facing a shortage of funds or external financing barriers, it has to give up some R & D projects aiming at future earnings, thereby reducing R & D investment expenses. Therefore, the existing research on solving the problem of insufficient R & D investment is largely focused on the perspective of alleviating corporate financing constraints, mainly discussing from the internal governance of companies and external institutional environment. That is, the improvement of internal governance structure, the improvement of financial development level and the improvement of legal environment can effectively alleviate the financing constraints faced by enterprises in R & D investment, so as to improve the level of R & D investment (LUO CY and CHEN L, 2011<sup>[6]</sup>; Xie WM and FANG HX, 2011<sup>[7]</sup>; GUO H, *et al.*, 2016<sup>[8]</sup>). The state has a complex and deep motivation for government subsidies to listed companies, including supporting industrial development, increasing employment, encouraging research and development as well as financing, maintaining certificates and avoiding deficits. Government subsidy policy is one of the main means for the government to implement macro-control and resource allocation, which has a boosting effect on the performance of enterprises, which can enable enterprises to obtain excess performance higher than the industry average in the short term (CHEN W, *et al.*, 2015<sup>[9]</sup>). And it can support the listed companies with poor earnings (HE HQ and LIU JZ, 2016<sup>[10]</sup>). In terms of the relationship between government subsidies and corporate R & D investment, the innovation behavior of enterprises is characterized by spillover. The private income of R & D enterprises is generally lower than the social benefits of R & D (XIE WM, *et al.*, 2009<sup>[11]</sup>), so enterprises' willingness to innovate will be reduced to a certain extent, thus leading to the so-called "market failure" phenomenon. This ultimately leads to insufficient R & D investment. The government has the function of solving the market failure and rationally allocating resources, because government subsidies can make up for part of the gap from the expected earnings of enterprises, thus prompting their willingness of R & D and innovation. In addition, government subsidies can provide direct financial

support for R & D and innovation activities of enterprises, thereby contributing to the increase in R & D investment. At the same time, based on the theory of signal transmission, government subsidies can release positive signals, thus enhancing the confidence of external investors, influencing investors' investment decisions and alleviating the financing constraints faced by enterprises in R & D investment (LI J, *et al.*, 2016<sup>[12]</sup>). In summary, as one of the effective ways of the Chinese government to participate in or interfere with the operation of micro-economic market, government subsidies play an important role especially in the field of agriculture. Then the government subsidies for agricultural listed companies should also play a role in addressing the financing constraints of their R & D. Therefore, the first hypothesis of this paper is proposed:

**H1: There is a correlation between government subsidies and R & D investment of companies**

### 2.2 Government subsidies and corporate R & D investment: based on the difference in the nature of property rights

Because there is information asymmetry between the government and enterprises, sometimes the government can not effectively identify the R & D activities which are beneficial to the society but are externally influenced, which will lead to the low efficiency of government subsidy allocation (XIAO XZ and WANG YP, 2013<sup>[13]</sup>). At present, there is no consensus on the relationship between government subsidies and enterprise innovation at home and abroad. In this paper, we hold that the existence of the dispute does not mean that the conclusion is contradictory. Therefore, it is more realistic to select the specific research perspective and analyze the impact of government subsidies on corporate R & D investment. From the industrial policy of our country, we can find that the attitude and support of the government to different industries are different. Therefore, in the case of the government's classified policy implementation, it is helpful to deepen the understanding of the relationship between government subsidies and corporate R & D investment by analyzing it in the same industry. The difference in the nature of property rights between enterprises is the unique institutional background of our country. The enterprises with different nature of property rights have significant differences in obtaining financial support and use efficiency. In terms of the relationship between the allocation of credit resources and the investment behavior of enterprises in China, bank loans are more inclined to state-owned enterprises (LIU Q, *et al.*, 2016<sup>[14]</sup>), but after obtaining credit funds, the degree of overinvestment of state-owned enterprises is higher than that of private enterprises, which also indirectly reflects the inefficiency of bank credit resource allocation (WU ZX and LI F, 2010<sup>[15]</sup>). Viewing from the social responsibilities of the enterprises with different nature of property rights, state-owned enterprises, since the founding of new China, do not simply serve the economic objectives, but also make up for the shortcomings of the market, carry out macro-control and optimize the allocation of resources, while the primary goal of private enterprises is to maximize benefits, basically with no additional policy burden. Therefore, based on the difference in the nature

property rights, it is of practical significance to analyze the different influences of government subsidies on R & D investment of state-owned enterprises and that of private enterprises. The existing research explores the motivations of enterprises with different nature of property rights to obtain government subsidies and the differences in their performance and profitability after obtaining government subsidies. An empirical study of WANG HJ, *et al.* (2014<sup>[16]</sup>) shows that state-owned enterprises are more likely to have the motive of deliberate earnings manipulation to obtain more government subsidies than private enterprises, thus greatly reducing the marginal value of government subsidies. Concerning the economic consequences to enterprises after obtaining government subsidies, government subsidies reduce the accounting conservatism of state-controlled companies (JIANG Y and TIAN KR, 2013<sup>[17]</sup>). Government subsidies can also be used as a positive signal to significantly increase the size of corporate credit funds, and this effect is more significant in private enterprises (SHEN XH, 2015<sup>[2]</sup>). However, while state-owned enterprises are more likely to receive government subsidies than private enterprises, government subsidies have a stronger negative impact on the return on assets and profitability of state-owned enterprises than non-state enterprises (HE HQ and LIU JZ, 2016<sup>[10]</sup>). In summary, in the absence of industry differences, the impact of government subsidies on R & D investment in agricultural listed companies will vary depending on the nature of property rights. Therefore, the second hypothesis of this paper is proposed:

**H2: The relationship between government subsidies and corporate R & D investment is different due to the difference in the nature of property rights**

### 3 Research design

**3.1 Sample selection and data sources** In this paper, China's A-share agricultural listed companies from 2010 to 2015 are selected as the research sample (SFC 2012 industry classification), and ST and \* ST companies and companies with incomplete data required are removed from the sample, and eventually 226 sample observation values of 46 companies are obtained. In order to reduce the influence of outliers, this paper uses the win-sorize method to process the extreme values of the variables at the 1% level. In this paper, the sample data is preprocessed using Excel2013, and a regression analysis is made on the sample data by Stata14.0. The data in this paper is derived from CSMAR Solu-

tion and Wind Financial Information Database.

### 3.2 Model construction and main variables

**3.2.1 Model construction.** In order to test the effect of government subsidies on corporate R & D investment (Hypothesis 1), this paper establishes Model (1). The significance of the coefficient  $\alpha_1$  of Sub in Model (1) is mainly validated.

$$R \& D = \alpha_0 + \alpha_1 Sub + \alpha_2 Owner + \alpha_3 Size + \alpha_4 Lev + \alpha_5 Herfindal\_5 + \sum YEAR + \sum REG + \varepsilon \quad (1)$$

In order to test the different influences of government subsidies on R & D investment of companies with different nature of property rights, this paper divides the sample into two groups: state-owned enterprises and private enterprises, and makes a comparative study on them, namely, Model (2) is used to validate Hypothesis 2. The significance of the coefficient  $\alpha_1$  of Sub in the two samples is mainly validated.

$$R \& D = \alpha_0 + \alpha_1 Sub + \alpha_2 Size + \alpha_3 Lev + \alpha_4 Herfindal\_5 + \sum YEAR + \sum REG + \varepsilon \quad (2)$$

**3.2.2 Variable selection.** Based on the above analysis, the explained variables, explanatory variables and control variables of this paper are set as follows:

Explained variables, intensity of R & D investment (R & D). This paper draws on the practice of HUANG JL, *et al.* (2014)<sup>[18]</sup>, selecting the sum of "intangible assets" and "development expenses" in the balance sheet, and dividing the above-mentioned R & D expenses by the current operating income, which indicates the intensity of R & D investment. Explanatory variables, government subsidies (Sub) and nature of property rights (Owner). In this paper, we draw on the practice of BU DL and WANG XY (2014)<sup>[19]</sup>, selecting the government subsidy data disclosed in the item "non-operating income" in the listed company's annual report, and taking its natural logarithm. With the nature of the ultimate controller as a standard of delimitation of property rights, the sample is divided into state-owned ones and private ones; when the listed companies are state-owned, Owner = 1, otherwise, Owner = 0. According to the existing research, the control variables influencing corporate R & D investment are selected: enterprise size (Size), capital structure (Lev), ownership concentration (Herfindahl\_5); in addition, the Year in the model refers to annual fixed effect, which is measured by introducing time dummy variables; Reg refers to regional fixed effect, which is measured by introducing province dummy variables. The specific variables are defined in Table 1.

**Table 1 Variable definition table**

Item	Variable name and symbol	Variable definition
Explained variable	Intensity of R & D (R & D)	Ratio of (Intangible assets + development expenses) to operating income
Explanatory variable	Government subsidies (Sub)	Natural logarithm value of "non-operating income—government subsidies"
	Nature of property rights (Owner)	As for state-owned enterprises, Owner = 1, otherwise, Owner = 0
Control variable	Enterprise size (Size)	Natural logarithm value of enterprise year-end total assets
	Capital structure (Lev)	Ratio of total liabilities to total assets
	Ownership concentration (Herfindahl_5)	Square sum of the shareholding ratio of the top five shareholders of an enterprise
	Region (Reg)	Regional dummy variable
	Year (Year)	Year dummy variable

**Table 2** Descriptive statistical results of variables

Variable	Number of samples	Mean	Standard deviation	Minimum value	Maximum value
<i>R &amp; D</i>	226	0.1920768	0.4871529	0	5.36232
<i>Sub</i>	226	16.32794	1.409238	9.98507	19.1626
<i>Owner</i>	226	0.3695652	0.4835638	0	1
<i>Size</i>	226	21.35835	0.9557991	18.8261	24.2198
<i>Lev</i>	226	41.63021	19.65187	2.8195	124.905
<i>Herfindahl_5</i>	226	0.1660824	0.1189006	0.004612	0.533349

## 4 Empirical results

**4.1 Descriptive statistical analysis** Table 2 reports the descriptive statistical results of the variables. It can be seen from the table that, in the sample of China's agricultural listed companies, some companies have not yet made R & D investment, resulting in the fact that the intensity of R & D investment index is 0, while in some enterprises, 5.36 yuan can be allocated for R & D investment from per unit of operating income, so there is a significant difference in the intensity of R & D investment between enterprises. And the difference in government subsidies is also quite sig-

nificant between different enterprises in the sample.

**4.2 Variable correlation analysis** Table 3 shows the results of the correlation analysis of variables. From the correlation coefficient, there is a significant correlation between the explained variable R & D and the explanatory variable Sub, which also preliminarily validates Hypothesis 1. And the correlation coefficient between the explanatory variable and the control variable is very small, indicating that there is no multi-collinearity between the variables.

**Table 3** Correlation coefficient matrix of the variables

Variable	R & D	Sub	Owner	Size	Lev	Herfindahl_5
<i>R &amp; D</i>	1.0000					
<i>Sub</i>	-0.1791 ***	1.0000				
<i>Owner</i>	-0.0546	0.2163 ***	1.0000			
<i>Size</i>	-0.0783	0.4941 ***	0.0278	1.0000		
<i>Lev</i>	0.0731	0.1465 *	0.0407	0.1767 ***	1.0000	
<i>Herfindahl_5</i>	-0.2383 ***	0.2149 ***	0.1201 *	0.3052 ***	0.1012	1.0000

Note: The data in the table is the correlation coefficient between the variables; \* and \*\*\* indicate the significance respectively at the level of 10% and 1%.

**4.3 Regression analysis** Table 4 lists the differences in the amount of government subsidies and R & D investment under different nature of property rights. It can be found that state-owned en-

terprises receive far more government subsidies than private enterprises, while the average level of R & D investment of private enterprises is higher than that of state-owned enterprises.

**Table 4** Differences in government subsidies and R & D investment under different nature of property rights (T test)

Variable	State-owned enterprise	Private enterprise	Difference
<i>Government subsidy</i>	16.7198 (0.1554)	16.0917 (0.1037)	0.6281 *** (0.1800)
<i>R &amp; D investment</i>	0.1576 (0.0280)	0.2125 (0.0438)	-0.0649 * (0.0609)

Note: The data in the table is the mean of the respective variables, and the contents bracketed are the standard errors; \*, \*\*\* indicate the significance respectively at the level of 10% and 1%.

Table 5 is the results of the regression analysis, examining the impact of government subsidies on intensity of R & D investment. In the whole sample, the coefficient (-0.0276) is significantly negative at the 5% level, indicating that the more government subsidies enterprises obtain, the lower the intensity of R & D investment is. The result gives us a suggestion that government subsidies are not omnipotent. We should analyze the impact of government subsidies respectively on corporate investment behavior and different capital investment, so as to maximize the effect of government subsidies. And we also find that the nature of property rights also affects the intensity of R & D investment, so we distinguish the nature of property rights to further refine the relationship between the two in depth. In Column (2), the group of state-

owned enterprises, government subsidies have a significant negative impact on the intensity of their R & D investment. There are two possible reasons. On the one hand, government subsidies to state-owned enterprises are more for policy objectives, that is, when the government increases subsidies to state-owned enterprises, it intends to give state-owned enterprises the political responsibility of promoting employment, enhancing infrastructure construction or increasing investment in fixed assets, etc. On the other hand, the existing research also shows that the willingness of state-owned enterprises to innovate is lower than that of private enterprises. Because of their natural advantages, the government has been showing "paternal love" on them, resulting in their weak demand for the innovation-driven impetus for sustainable develop-

ment. Instead, after gaining the favor of government subsidies, they want to give back to the government through better performance, so that they make more project decisions that produce short-term profits, and reduce long-term and high-risk investment projects like R & D investment, thus meeting the government's "goals of political achievements". To sum up, the more government subsidies state-owned enterprises receive, the weaker their intensity of R & D investment will be. In Column (3), the group of private enterprises, government subsidies have a significant positive impact on the intensity of their R & D investment. Corresponding to state-owned enterprises, there are also two possible reasons. On the one hand, the primary target of private enterprises is "benefit maximization", and they bear less policy burdens, so their investment decision-making is basically in line with their rational goals. Compared with state-owned enterprises, private enterprises are facing more serious financing constraints in R & D investment, such as credit funds. For risk considerations, banks are more inclined to support fixed asset investment projects of enterprises, so when private enterprises receive government subsidies, they will cherish the lower-cost funds, and put them into R & D investment projects with greater financing constraints. On the other hand, the policy background of the selected sample interval in this paper, namely,

the advocacy of "mass innovation and entrepreneurship", as well as the innovation-driven development strategy introduced by the 18<sup>th</sup> CPC National Congress, are also guiding the management and investment activities of private enterprises. Different from state-owned enterprises with natural advantages, private enterprises must follow the direction of government policies in order to keep a foothold in the increasingly fierce market competition. They must actively put government subsidies into R & D investment, so as to enhance their own development advantages and also release a positive signal to the government and leave a good "impression", which will help them to get more government funding or preferential policies. To sum up, the more government subsidies private enterprises receive, the stronger their intensity of R & D investment will be. For other control variables, the coefficient of enterprise size (Size) is significantly positive, indicating that larger enterprises have more motives and abilities to increase R & D investment; the coefficient of capital structure (Lev) is significantly negative in state-owned enterprises, indicating that enterprises facing high financing constraints are also restricted in R & D investment to a certain extent; the regression coefficient of ownership concentration (Herfindahl\_5) is significantly negative, indicating that high ownership concentration is not conducive to the innovation of enterprises.

**Table 5** Multiple regression analysis results

Variable	Full sample (1)	State-owned enterprise (2)	Private enterprise (3)
<i>Sub</i>	-0.0276 ** (-2.45)	-0.0565 ** (-3.2)	0.0255 * (1.9)
<i>Owner</i>	0.0493 * (1.78)	- -	- -
<i>Size</i>	0.0553 ** (2.98)	0.1288 *** (4.28)	-0.0520 * (-2.50)
<i>Lev</i>	-0.0012 (-1.52)	-0.0038 *** (-2.79)	0.0001 (1.16)
<i>Herfindahl_5</i>	-0.7422 *** (-6.49)	-0.8360 *** (-4.39)	-0.7380 *** (-5.71)
Constant term	-0.4294 (-1.21)	-1.3438 * (-2.15)	0.9334 * (2.55)
<i>Reg</i>	Control	Control	Control
<i>Year</i>	Control	Control	Control
<i>N</i>	226	92	134
<i>Adj. R<sup>2</sup></i>	0.1803	0.3165	0.2277
<i>F</i> value	10.89 ***	11.54 ***	10.80 ***

Note: The data in the table is the regression coefficient of the respective variables, and the contents bracketed are t value; \*, \*\*, \*\*\* indicate the significance respectively at the level of 10%, 5% and 1%.

**4.4 Robustness test** In order to ensure the robustness of the results of this paper, taking into account the hysteretic nature that enterprises may make investment decisions after obtaining government subsidies, this paper makes another regression analysis with the variable of intensity of R & D investment for the last period, finding that there is no substantial change in its symbol and significance degree, which further shows that the conclusion of this paper is robust.

## 5 Conclusions and recommendations

**5.1 Conclusions** In this paper, using China's A-share agricultural listed companies from 2010 to 2015 as research samples, we

discuss the influence of government subsidies on research and development investment, and the difference in the relationships between the two from the perspective of different nature of property rights. The results show that, on the whole, the increase in government subsidies does not promote the intensity of R & D investment of agricultural listed companies. And after distinguishing the nature of property rights, the results show that state-owned enterprises can get more government subsidies than private enterprises, and the increase in government subsidies boosts the increase in R & D investment in private enterprises, but there is a negative correlation between government subsidies and R & D investment of state-owned enterprises.

**5.2 Recommendations** Based on the conclusion of this paper, the following inspirations are obtained: (i) The government should promote the two-way communication with enterprises and reduce the information asymmetry between the government and enterprises, and the government should also further understand and objectively evaluate the needs of enterprises, so as to formulate supporting policies and determine the amount of subsidies. At the same time, government subsidies have some policy risks, and even lead to moral hazards, so the government should also strengthen the supervision on the use and flow of government subsidies to enterprises, in order to avoid the rent and rent-seeking behavior as far as possible, and improve the allocation efficiency of government subsidies. (ii) "Discrimination of ownership" should be minimized as far as possible in government subsidies, and classified policy implementation should be carried out according to the nature of property rights. The government should adhere to the principle of moderation, not "spoiling" state-owned enterprises, and not being "mean" to private enterprises as well. It should also release positive and correct signals, and lead the correct direction of development. Besides, it should also properly guide state-owned enterprises to increase the intensity of R & D investment and enhance the willingness to innovate, so as to release the vitality of business operation, and orderly realize the mixed ownership reform of state-owned enterprises. At the same time, the government should also pay attention to private enterprises as a gradually developing and expanding force, providing them with effective government support. (iii) Enterprises, especially private ones, should actively find and handle the internal control factors that affect R & D investment, such as ownership concentration and agency costs, etc., and strengthen the analysis of corporate governance environment and corporate R & D investment, which can not only improve their own business and investment efficiency, but also release a positive signal to the government, thus striving for more supporting policies. (iv) Further research direction: through empirical research we found that government subsidies can affect the R & D investment of agricultural listed companies, especially promote the increase in the intensity of R & D investment of private enterprises, then whether government subsidies can promote the sustainability of corporate R & D and whether they will be affected by the internal governance environment of enterprises or the adjustment of institutional environment, has become a focus. Because the R & D investment of the enterprises has the characteristics of long cycle and high risk, even if a project of R & D investment is successfully started, it is often faced with the risk of capital flow chain breaking in the process of R & D, which makes the R & D project die prematurely. If government subsidies can play a role in the sustainability of corporate R & D and innovation, they will help to reduce the worries of enterprises, enhance their willingness and ability of R & D and innovation, and also allow itself to actively play its regulatory role in market allocation of resources based on the innovation-driven strategy.

## References

- [1] LAI YL, LIN FJ, LIN YH. Factors affecting firm's R&D investment decisions[J]. *Journal of Business Research*, 2015, 68(4): 840–844.
- [2] SHEN XH. An empirical check of government subsidy, property right properties and debt financing effect[J]. *Economic Survey*, 2015(2): 138–143.
- [3] LU X, ZHENG YF, LI JM. Study on the effect of financing constraints on R&D investment[J]. *Accounting Research*, 2013(5): 51–58, 96. (in Chinese).
- [4] GU Q, ZHAI SP. Financial constraints, R&D investment and funding sources: The perspective of R&D heterogeneity[J]. *Science of Science and Management of S. & T.*, 2014, 35(3): 15–22. (in Chinese).
- [5] XIE JZ, LIU SY, LI HJ. Politics relevance, financing constraints and enterprise research and development investment[J]. *The Study of Finance and Economics*, 2014(8): 81–93. (in Chinese).
- [6] LUO CY, CHEN L. Whether FDI can alleviate financing constraints of Chinese enterprises[J]. *The Journal of World Economy*, 2011(4): 42–61. (in Chinese).
- [7] XIE WM, FANG HX. Financial development, financing constraints and enterprise research and development investment[J]. *Journal of Financial Research*, 2011(5): 171–183. (in Chinese).
- [8] GUO H, ZHANG BX, LI HJ. Legal institution environment, credit and loan allocation and enterprise research and development investment[J]. *Macroeconomics*, 2016(9): 118–129. (in Chinese).
- [9] CHEN W, WU SN, HUANG PP. Political relevance, government support and corporate performance[J]. *Economist*, 2015(9): 48–58. (in Chinese).
- [10] HE HQ, LIU JZ. Nature of property right, government subsidies and corporate profitability: Empirical study on listed companies in machinery, equipment and instrumentation[J]. *Journal of Central South University: Social Science*, 2016, 22(2): 76–83. (in Chinese).
- [11] XIE WM, TANG QQ, LU SS. Government R&D aid financially and enterprises R&D expenditure and autonomous innovation[J]. *Journal of Financial Research*, 2009(6): 86–99. (in Chinese).
- [12] LI J, YANG BB, PAN Z. Government subsidy, ownership intensity and the persistence of firm innovation[J]. *China Soft Science*, 2016(6): 180–192. (in Chinese).
- [13] XIAO XZ, WANG YP. Government subsidies and enterprise decision of social capital investment—Evidence from strategic emerging industries[J]. *China Industrial Economy*, 2014(9): 148–160. (in Chinese).
- [14] LIU QG, PAN XF, TIAN GG. To what extent did the economic stimulus package influence bank lending and corporate investment decisions Evidence from China[J]. *Journal of Banking & Finance*, 2016.
- [15] WU ZX, LI F. State holding, efficiency of investment and allocation of credit resources[J]. *Research on Financial and Economic Issues*, 2010(11): 50–55. (in Chinese).
- [16] WANG HJ, LI QY, XING P. Financial crisis, government subsidies and earnings manipulation: An empirical evidence from Chinese listed companies[J]. *Management World*, 2014(7): 157–167. (in Chinese).
- [17] JIANG Y, TIAN KR. Internal characteristics of state holding listed companies, government subsidies and accounting conservatism[J]. *Economy & Audit Study*, 2013(1): 77–86. (in Chinese).
- [18] HUANG JL, TANG P, JIANG ZH. The research and development investment, risk and benefit of agricultural enterprises under the preferential tax policy—Based on the empirical test of agricultural listed companies in China[J]. *Journal of Agrotechnical Economics*, 2014(2): 120–128. (in Chinese).
- [19] BU DL, WANG XY. Subsidy, soft constraint and pay gap[J]. *Nankai Business Review*, 2014, (2): 23–33. (in Chinese).