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Multiple Large Shareholders and Corporate Innovation: Evidence from Chinese Listed Company

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Abstract

Using a sample of Chinese listed companies from 2010 to 2015, this paper selects the large shareholder, a factor related to corporate governance, and uses the shareholders of the listed company's shareholders holding more than 10% as the measure of the major shareholder. The impact of shareholders and multiple large shareholders on the technological innovation of the company. Then we further studied the different effects of the nature of equity and the type of shareholder on this effect. The study found that largest controlling shareholder has a negative inhibitory effect on the technological innovation of the enterprise. On the contrary, multiple large shareholders have a significant positive role in promoting technological innovation. This article not only reveals the impact of multiple large shareholders on corporate technological innovation, but also promotes the corporate governance of the corporate shareholders in China, and then promotes technological innovation and provides empirical evidence.

Keywords

Multiple Large Shareholders; Corporate Innovation; R&D Investment.

1. INTRODUCTION

With the development of science and technology, "innovation" has become the main melody of national and enterprise development. People gradually realize the importance of technological innovation in strengthening national strength and increasing the competitiveness of enterprises. More and more scholars pay attention to corporate innovation. There are many factors that affect corporate innovation. In terms of the hold nation, influencing factors include legal policies, government spending and subsidies, social characteristics such as culture of corruption and gambling preference. In terms of market, the influencing factors include foreign import competition, bank regulation, tax, etc. In terms of enterprises, influencing factors include venture capital, whether the enterprise is listed, and the personal characteristics of the CEO, institutional investors, etc. The investment in innovation projects is one of the major decision-making activities of enterprises, and the subject of decision-making in this project is the actual controller of enterprises. Shareholders are one of the indispensable parts of enterprise R&D investment. Although many scholars have studied corporate R&D behavior from the perspectives of executive ownership, equity incentive and equity diversification, etc. However, there is still no consensus on how ownership structure affects enterprise technological innovation. Therefore, it is necessary to verify the relationship between shareholders and enterprise innovation from more perspectives.

The shareholding structure of Chinese enterprises is characterized by "one dominant share". The controlling shareholder grasps the operation and management power of the company by sending representatives or directly acting as the chairman of the board by himself. In addition to the shareholding structure in which the largest shareholder has absolute control, the shareholding structure of several major shareholders also exists widely in the world. Of

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multiple large shareholders and corporate governance, according to a study of multiple large shareholders of enterprises have a higher dividend payments (Faccio etal., 2001), lower connection transaction, lower earnings management, the existing investment efficiency behavior (Dou etc., 2011), a lower cost of debt financing (Wang and Jiang, 2017), and so on. With the continuous development of capital market, corporate governance of modern companies is mainly manifested as the conflict of interests between shareholders. This paper discusses the relationship between multiple large shareholders and enterprise technological innovation. It is of great significance to perfect the corporate governance structure of Chinese enterprises, improve the lack of innovation driving force and enhance the competitiveness of enterprises.

The contribution of this paper lies in the following aspects: Firstly, whether multiple major shareholders are conducive to corporate governance or not, there is no conclusion yet. From a new perspective, this paper is more concerned about the shareholding ratio of other major shareholders except the first major shareholder, combining with the frontier research field of enterprise technology innovation. Then, this paper supplements the ownership structure and enterprise technology innovation related theories. Previous paper found that the structure of multiple major shareholders has verified the firm value, dividend payment, earnings management, etc. However this paper has supplemented the theory of the influence of multiple large shareholders and firm innovation.

The rest of this paper is structured as follows: The second part is a research review and analysis and puts forward research hypotheses. The third part is the research design. The fourth part provides the results of empirical test and analysis, and the last part is the conclusion and inspiration of the article.

2. LITERATURE REVIEW AND HYPOTHESE

In recent years, many scholars have studied the relationship between ownership structure and enterprise innovation. (1) The influence of ownership concentration on corporate innovation. Some scholars believe that equity concentration can promote enterprise R&D investment. The existence of large shareholders will help to curb the behavior of managers seeking selfish interests (Corton & Schmid, 1999). Equity concentration can alleviate the problem of minority shareholders "voting with their feet" and the phenomenon of "free riding" under equity decentralization, and influence enterprise innovation through the mediating effect of management incentives (Francis & Smith, 1995; Yang et al., 2010). Some scholars also found that equity concentration has a negative impact on enterprise innovation. Using the SME board data of 2007 as the sample, Liu and Wang (2010) tested the influence of ownership concentration and the proportion of the largest shareholder on the driving force of technological innovation, and concluded that ownership concentration is significantly positively correlated with the driving force of technological innovation, while the proportion of the largest shareholder is negatively correlated with the driving force of technological innovation. This shows that a certain concentration of ownership is conducive to enterprise innovation. Once the phenomenon of "single dominant share" is achieved, shareholders with absolute control are more inclined to occupy the interests of minority shareholders, ignore the long-term interests of the enterprise and make inappropriate decisions on enterprise innovation activities. (2) The influence of ownership nature on enterprise innovation. Due to the different ownership nature of state-owned enterprises and private enterprises in China, there are many differences in operating objectives and operating environments. However, most studies believe that state-owned enterprises are not conducive to R&D investment, because the absence of effective shareholding subjects can not effectively supervise managers, at the same time, they will steal the company's interests and avoid high-risk projects such as innovation

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(Ren, 2010). Instead, Yu (2012) found that Chinese manufacturing enterprises is bigger than non-state-owned enterprise R&D investment intensity, this is due to the state-owned enterprises in such aspects as policy, market resources have more advantages than the non-state-owned enterprises, even though the non-state enterprise investment desire strong, but because of weak risk tolerance, insufficient resources, often lack of confidence to put money into a high-risk characteristics of innovation projects. (3) The influence of equity balance on enterprise innovation. Based on the event study, Jiang and Liu (2012) found that the equity balance mechanism of the company is conducive to promoting the diversification of the equity nature of major shareholders and to corporate governance. This paper holds that a single big shareholder of a company will induce the controlling shareholders to encroach on the interests, which will make the shareholders only care about the immediate interests and ignore the long-term interests, and will hinder the technological innovation of the enterprise. The existing literatures pay too much attention to the characteristics of highly concentrated ownership and the inefficient behavior under decentralized ownership, but ignore the characteristics of ownership structure of multiple large shareholders.

2.1. Corporate Innovation with A Single Large Shareholder

How large shareholders play a role in corporate governance has always been the focus of research. Cubbin & Leech (1983) put forward the concept of the minimum shareholding ratio that the controlling shareholder can effectively control the operation and management of the enterprise, and believed that the control power of the enterprise is related to the shareholding ratio. A single large shareholder is not conducive to the technological innovation of enterprises. First, a single large shareholder seeks private gains. When the shareholding ratio of a single major shareholder can form absolute control over the enterprise, the major shareholder will use the control right to seek private benefits. With the increase of power, the motive of rent-seeking of the largest shareholder will become stronger and stronger, and the enterprise will be hollowed out if it encroach on the interests of the enterprise (Zhu and Zhou, 2016). Therefore, the existence of a single large shareholder will reduce its investment that is beneficial to the long-term development of the enterprise and the investment in projects with a high degree of risk, which will have a negative impact on enterprise innovation (Boubaker etal., 2016). Second, a single large shareholder lacks diversification. When a shareholder has absolute control advantage, the shareholder tends to lack diversification (Dyck & Zingales, 2004). A single major shareholder who invests is able to bear lower risks than a large shareholder who holds diversified investments (Faccio, 2011). When a single large shareholder does not hold diversified investments, it is often not necessary for him to make risk investment, and innovation investment is no exception, thus he is short of technological innovation investment. Based on this, this paper proposes:

H1: A single large shareholder is associated with lower corporate innovation.

2.2. Corporate Innovation with Multiple Large Shareholders

With the reform of ownership of enterprises in China, the ownership structure of many large shareholders is playing an increasingly important role in China. Different from general business activities, innovation activities have the characteristics of large capital input, long investment cycle, high risk and uncertainty. Multiple large shareholders may promote the technological innovation of the enterprise. First, risk sharing. Due to the high shareholding ratio, the wealth of stakeholders is more concentrated, so it is difficult to effectively diversify the unique risks of high-risk projects (Fama & Jensen, 1983). Multiple large shareholders and the number of voting rights associated with higher risk bearing (Boubaker etal., 2016), more risk-taking (Mishra, 2011), shareholders prefer high-risk high-yield innovation projects, and the risk of innovation investment of R&D investment is an irreversible investment, so once the project fails, the money

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back, a single large shareholder will alone bear the huge risk. Therefore, when there are multiple large shareholders, the project risk can be spread among multiple shareholders, making it possible to participate in high-risk and uncertain innovative projects. Second, effective supervision. Multiple large shareholders can supervise managers' business activities more effectively than companies with a single major shareholder (Chen and Bian, 2015). In consideration of performance and salary, managers pay more attention to short-term profits rather than long-term returns, which forces managers to refrain from carrying out innovative activities that would erode short-term performance (He & Tian, 2013). However, the existence of multiple large shareholders can not only contain the controlling shareholders, but also effectively restrain the managers' short-sighted behavior and participate in the enterprise innovation activities with long-term characteristics. So the existence of multiple large shareholders can effectively contain the controlling shareholders, reduce a single large shareholder "empty" motives, avoid absolute controlling shareholders for their own interests to plunder company assets and profits. Based on this, this paper proposes:

H2: Multiple large shareholders are associated with higher corporate innovation.

3. DATA AND METHODOLOGY

3.1. Model

In order to investigate the impact of multiple large shareholders on corporate innovation, this paper uses R&D investment to measure corporate innovation behavior and uses OLS to estimate it. The model is as follows:

$$RD_{i,t} = \beta_0 + \beta_1 Multi_{i,t-1} + \beta_2 Size_{i,t-1} + \beta_3 Lev_{i,t-1} + \beta_4 ROA_{i,t-1} + \beta_5 \Pr ofit_{i,t-1} + \beta_6 Cash_{i,t-1} + \beta_7 Soe_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

RD is the intensity of R&D investment. Multi is the ownership structure of multiple large shareholders. Control variables include enterprise size, asset-liability ratio, profitability, development ability, cash flow, enterprise nature, etc. i is a public company. t is time. εi,t is the disturbance term.

3.2. Sample

In this paper, the data from the CSMAR and RESET. Considering the availability, completeness and convenience of data samples, this paper adopts the R&D input data of listed companies from 2010 to 2015, and conducts screening according to the following conditions: (1) Exclude financial listed companies; (2) Listed companies with listing time less than or equal to 1 year are excluded; (3) The listed companies that were ST and PT were excluded; (4) Listed companies without R&D input data for at least two consecutive years are excluded. Excel and Stata13 were used in this paper to integrate the data.

3.3. Measure and Determinants of Variables

3.3.1. Dependent variable

Corporate innovation (RD): At present, the theoretical circle measures the technological innovation of enterprises including innovation input and innovation output. Most of the literature uses R&D expenditure/total assets or R&D expenditure/income as the measure of firm's technological innovation. Since the investment in innovation is mainly decided by the managers and decision makers, the investment in R&D is a good reflection of the agent behavior of the managers. Considering the availability of enterprise innovation data, this paper selects

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R&D expenditure/income to measure enterprise technological innovation, denoted as RD. 3.3.2. Independent variable

Multiple large shareholders (Multi): According to the provisions of the Company Law of China, the shareholders holding more than 10% of the company's shares alone or in total have the right to request the board of directors to convene an extraordinary general meeting of shareholders. In addition, when holding more than 10% of the company's shares, it is generally allowed to send at least one director to the listed company, or require senior executives to be sent to the listed company to participate in the company's decision-making and operation management. So it makes sense to adopt 10% as the majority shareholder standard. In this paper, the company of two or more shareholders with shareholding ratio greater than 10% is an enterprise with multiple major shareholders, which is measured by the dummy variable Multi. If this satisfies the above definition, then Multi=1. Otherwise, Multi=0.

A single large shareholder (Sr 1): This paper adds a single large shareholder and corporate innovation results compared with multiple large shareholders.

When only one of the listed companies has a shareholding ratio greater than 10%, the shareholding ratio of the largest shareholder of the listed company is taken as the measurement index of a single major shareholder, which is denoted as SR1.

In addition, the independent variables also include enterprise size, asset-liability ratio, profitability, development ability, cash flow, equity nature, etc.

Table 1. Variable definitions

Variable name	Symbol	Variable definition
R&D investment	RD	Ratio of R&D investment in sales revenue(%)
The largest shareholder holds shares	Sr1	The shareholding ratio of a single major shareholder and the shareholding ratio of a listed company with a shareholding ratio of more than 10%
Multiple lager share-holder	Multi	For the dummy variable of the existence of multiple major shareholders, the value of multiple major shareholders of the listed company with two or more than two shareholders holding more than 10% shares is 1, or 0 if not
Firm size	Size	The natural log of the total assets at period t-1
Asset-liability ratio	Lev	Asset-liability ratio at period t-1
ROA	ROA	Rate of return on total assets at period t-1
Development ability	Profit	Net profit growth rate at period t-1
Cash flow	Cash	Cash recovery for all assets at period t-1
nature of listed com-panies	Soe	For the dummy variable of equity nature of listed companies, take 1 for state-owned enterprises, or 0 if not

4. EMPIRICAL RESULTS

4.1. Summary Statistics

Table 2 lists the descriptive statistical results of each variable. Panel A reports the descriptive statistical results of the whole sample in this paper. It can be seen that the average proportion

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of R&D investment in sales revenue is 3.647%, the average value of R&D investment is 173 million yuan, and the standard deviation is 4.4.

Table 2. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
RD	6562	3.647	4.4	0	137.45
Sr1	6944	36.494	15.394	3.39	99
Multi	6944	0.351	0.477	0	1
Size	6592	21.947	1.28	16.161	29.021
Lev	6944	0.427	0.211	0.008	2.861
ROA	6592	0.06	1.336	-2.555	108.366
Profit	6296	0.292	101.585	-4450.3	4254.92
Cash	5412	0.042	0.077	-1.938	0.379
Soe	6944	0.383	0.486	0	1

4.2. Correlation Test

Table 3 shows that a single large shareholder is negatively correlated with R&D investment, while multiple large shareholders are positively correlated with R&D investment. The correlation coefficients between some variables are significant, but the correlation coefficients are small, which means that multicollinearity problems are unlikely to be designed for multiple regression.

Table 3. Correlation Test

	RD	Sr1	Multi	Size	Lev	ROA	Profit	Cash	Soe
RD	1								
Sr1	-0.1230*	1							
Multi	0.0572*	-0.2934*	1						
Size	-0.1922*	0.2400*	-0.0987	1					
Lev	-0.2402	0.0479	-0.1308	0.4751	1				
ROA	-0.0002	-0.0081	0.0195	-0.0566*	0.0132	1			
Profit	-0.0126	0.0027	0.0167	-0.0165	-0.0009	-0.0004	1		
Cash	0.0277*	0.0794*	0.0089	0.0688*	-0.1505	0.0079	-0.0177	1	
Soe	-0.1068*	0.1708*	0.1575*	0.3712*	0.3195	0.016	0.0103	-0.0038	1

4.3. Empirical Results

Firstly, the relationship between single large shareholder and corporate innovation is verified. Model (1) is used to empirically test the effect of a single major shareholder on enterprise technological innovation, and the results are shown in Table 4.

Column (1) - (2) list the influence of a single large shareholder on corporate technological innovation. The coefficient of single large shareholder is significantly negative. After the addition of enterprise characteristic control, the coefficient of single major shareholder is -0.0139, and it is significant at the level of 5%. This result verifies H1.

Then, Model (1) is adopted to verify the influence of multiple large shareholders on corporate innovation. The empirical results are shown in Table 5. Among them, column (1) is the univariate regression result with R&D investment as the explained variable. The coefficient is 0.526 and is significantly positive at the 1% significance level. When the firm characteristics are

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added, the coefficient is still significantly positive. It shows that the existence of multiple major shareholders can promote the R&D investment of enterprises, which verifies Hypothesis 2.

Table 4. Influence of a single large shareholder on R&D

	(1) LCS RD	(2) LCS RD
Sr1	-0.0252***	-0.0139**
	(-6.25)	(-2.97)
Size		-0.307***
		(-4.19)
Lev		-4.305***
		(-10.45)
ROA		1.612
		(1.47)
Profit		-0.000554
		(-0.74)
Cash		0.304
		(0.33)
Soe		-0.171
		(-1.12)
_cons	4.48***	12.61***
	(26.16)	(8.53)
Year Dummies	YES	YES
Industry Dummies	YES	YES
Adj R-squared	0.0097	0.0972
N	3874	2731

Table 5. Influence of multiple large shareholders on R&D

	(1) Full sample RD	(2) Full sample RD
Multi	0.526***	0.308*
	(4.64)	(2.27)
Size		-0.326***
		(-5.35)
Lev		-4.369***
		(-12.16)
ROA		-0.0287
		(-0.73)
Profit		-0.000547
		(-0.84)
Cash		-0.797
		(-0.93)
Soe		-0.136
		(-0.96)
_cons	3.460***	12.62***
	(51.21)	(10.02)
Year Dummies	YES	YES
Industry Dummies	YES	YES
Adj R-squared	0.0031	0.0733
N	6562	4489

***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

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4.4. Sensitivity Tests

Since the relative shareholding power and shareholding dispersion degree can also reflect the influence of multiple large shareholders on the technological innovation of the enterprise from another perspective, this paper uses the method of substitution variables to conduct stability test.

First of all, the relative holding power of large shareholders is used to replace them. When multiple large shareholders hold more shares, they will have stronger power to contend with the largest shareholder, more motivation to participate in corporate governance and greater degree of risk sharing. Based on this sample, the vast majority of companies have only two large shareholders. Therefore, the relative holding power is measured by the shareholding ratio between the second largest shareholder and the first largest shareholder, which is denoted as Share2_val. Secondly, if the shareholding of more than 10% is considered as a major shareholder, the enterprise contains at most 5 major shareholders. Therefore, the ratio of the sum of the shares held by the second and fifth largest shareholders to the shares held by the first largest shareholder is used to consider the relative shareholding power of several large shareholders, and it is denoted as Share5_val. This paper also refers to the practice of Wang and Jiang (2017), using the sum of shares held by several large shareholders and the proportion of the first major shareholder, which is expressed as Multi_val. The larger the value of Share2_val, Share5_val and Multi_val, the stronger the relative holding power of multiple major shareholders.

Column (1) - (3) of Table 6 reports the results of the relative shareholding strength of multiple major shareholders when Model (1) is adopted. The results show that the coefficients of Share2_val, Share5_val and Multi_val are 1.165, 0.707 and 0.356, respectively, which are all significantly positive at the significance level of 1%. No matter which method is used to measure the relative shareholding power of multiple large shareholders, the R&D investment of enterprises is promoted.

Then, the shareholding dispersion degree of multiple major shareholders is used to replace. When multiple large shareholders hold shares evenly, it not only relieves the benefit encroachment of a single large shareholder, but also helps alleviate the "free riding" behavior among shareholders in the case of dispersed shareholders. In addition, Bennedsen & Wolfenzon (2000) found that when major shareholders hold even shares, the controlling alliance formed by major shareholders will have more cash flow rights. At this time, the synergistic effect of the controlling alliance is reduced, and the motivation of the embezzlement is reduced, which is conducive to promoting the investment efficiency. On the contrary, if multiple major shareholders form a controlling alliance with low cash flow rights, it will worsen corporate governance (Wang and Jiang, 2017). This paper uses the ratio of the difference between the shareholding of the largest shareholder and the second largest shareholder to the sum of the shareholding to measure the degree of equity diversification of major shareholders, which is denoted as Disper. The smaller the value is, the more evenly the equity distribution of multiple major shareholders is considered.

Column (4) in Table 6 reports the results of multiple large shareholders' equity diversification on enterprise R&D investment. Disper has a coefficient of -1.134 and is significant at the 1% significance level. It shows that when the major shareholders hold more evenly, the innovation investment of enterprises can be promoted.

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Table 6. Sensitivity tests

	(1) Full sample RD	(2) Full sample RD	(3) Full sample RD	(4) Full sample RD
Cont2	1.165***			
	(5.10)			
Cont5		0.707***		
		(6.15)		
Diff			0.356*	
			(2.35)	
Dis_Per				-1.134***
				(-5.19)
Size	-0.324***	-0.312***	-0.331***	-0.322***
	(-5.32)	(-5.14)	(-5.44)	(-5.29)
Lev	-4.333***	-4.284***	-4.352***	-4.333***
	(-12.09)	(-11.96)	(-12.09)	(-12.09)
ROA	-0.0300	-0.0312	-0.0285	-0.0301
	(-0.76)	(-0.80)	(-0.72)	(-0.77)
Profit	-0.000509	-0.000485	-0.000519	-0.000519
	(-0.79)	(-0.75)	(-0.80)	(-0.80)
Cash	-0.747	-0.702	-0.824	-0.731
	(-0.87)	(-0.82)	(-0.96)	(-0.85)
Soe	-0.0469	0.00825	-0.139	-0.0260
	(-0.33)	(0.06)	(-0.98)	(-0.18)
_cons	12.24***	11.88***	12.74***	13.22***
	(9.72)	(9.42)	(10.14)	(10.52)
Year Dummies	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES
Adj R-squared	0.0776	0.08	0.0734	0.0778
N	4489	4489	4489	4489

***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

5. CONCLUSION

With the reform of mixed ownership in China, shareholders are an important subject in corporate governance. Based on an empirical study of Chinese listed companies from 2010 to 2015, this paper makes a comparative analysis of the impact of a single large shareholder and multiple large shareholders on enterprise innovation. The conclusions are as follows:

1. A single large shareholder has a negative effect on the technological innovation of enterprises, which is related to the fact that enterprises of a single major shareholder will seek more private interests and lack of diversification.

2. Multiple large shareholders have a significant positive effect on technological innovation, which is because the ownership structure of multiple major shareholders is conducive to risk sharing of major shareholders, to effective supervision of managers, and the motive of the largest shareholder seeking private gains.

The research of this paper is of great significance to improve the corporate governance structure of Chinese enterprises, improve the lack of innovation driving force and provide the

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competitiveness of enterprises. First of all, multiple large shareholders not only alleviate the benefit encroachment behavior of a single large shareholder, but also alleviate the inefficient behavior under the equity decentralization. Secondly, in the process of deepening reform in China, we pay attention to improving the structure of shareholder participation and corporate governance in enterprises, and attach importance to the implementation of such policies. This is conducive to improving the development competitiveness of Chinese enterprises in the world and realizing the growth of national economic aggregate and the development of enterprises themselves.

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