

Research on the Impact of Equity Pledge by Controlling Shareholders on Innovation of A-share Listed Companies

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Abstract

This paper takes China A-share listed companies from 2013 to 2024 as the research object, and investigates the influence of the controlling shareholder's equity pledge on enterprise innovation. The empirical results show that the equity pledge of controlling shareholders can significantly inhibit enterprise innovation. Finally, based on the empirical analysis results, this paper puts forward targeted policy suggestions from the government, enterprises and other aspects to provide reference for promoting the innovative development of enterprises and the healthy operation of the capital market.

Keywords

Enterprise Innovation; Equity Pledge; Controlling Shareholders.

1. Introduction

Since the reform and opening up, China's economy has achieved rapid growth driven by factors and investment. However, with the decline of demographic dividend, the intensification of resource and environmental constraints and the evolution of international competition pattern, the traditional growth model is facing bottlenecks, and the transformation to innovation-driven high-quality development has become the core of national strategy. In this context, as the main body of innovation, the innovation ability of enterprises is directly related to the effectiveness of economic transformation and upgrading.

Innovation activities have the characteristics of long cycle, high uncertainty and large capital demand, which makes financing constraints a key bottleneck for enterprise innovation. As a flexible and convenient financing tool, equity pledge is increasingly favored by controlling shareholders in the capital market. Although it can meet the capital demand quickly without diluting the control right, it may also aggravate the agency problem, induce the short-term behavior of controlling shareholders, and then have a restraining effect on enterprise innovation.

Therefore, studying the influence of controlling shareholder's equity pledge on enterprise innovation can not only enrich the relevant theories in the field of corporate finance and corporate governance, but also provide empirical evidence for listed companies to optimize financing decisions and improve pledge rules for regulatory agencies, which is of great practical significance for promoting innovation-driven development strategy and promoting high-quality economic development.

2. Research Hypothesis

From the perspective of agency problem, equity pledge will significantly aggravate the interest differences between controlling shareholders and minority shareholders, leading to the deviation between the controlling shareholders' decision-making objectives and the long-term value maximization objectives of enterprises. During the pledge period, the separation of the control right of the pledged equity and the cash flow right makes the controlling shareholder

pay more attention to the short-term financial security and personal liquidity demand, and provides convenience for the controlling shareholder to empty the company assets [1]. And after the equity pledge, the controlling shareholders' meeting will urge enterprises to allocate short-term financial assets to transfer corporate profits [2].

From the perspective of short-sighted behavior and weakened governance efficiency, the risk of control transfer and short-term debt repayment pressure brought by equity pledge will extend from the controlling shareholder to the management, forming a short-sighted decision-making tendency of the whole chain [3]. For the controlling shareholder, after pledging the equity, it is necessary to face the repayment pressure and pledge terms. If the short-term performance of the enterprise leads to the stock price decline, it may not only trigger the risk of liquidation, lose control, but also affect the subsequent financing ability and reputation of the enterprise. Therefore, after the equity pledge, enterprises will adjust their behavior decisions, focusing on short-term performance improvement and market value stability, rather than focusing on innovative activities to enhance the core competitiveness of enterprises, and are no longer willing to invest in high-risk projects [4].

Based on the above theoretical analysis, this paper puts forward the following research hypotheses:

Hypothesis 1: the pledge of controlling shareholder's equity will inhibit the innovation of listed companies.

3. Research Design

3.1. Sample Selection and Data Source

Taking China A-share listed companies from 2013 to 2024 as the research sample. At the same time, the data are processed as follows: first, when selecting sample companies, according to the industry division method of CSRC, the relevant enterprises listed in the financial industry are excluded; And eliminate the listed companies that have been ST or PT in the sample interval; Secondly, the samples with serious data missing are eliminated and the observed values with missing research variables are deleted. Finally, the continuous variables in the sample are truncated by 1% to reduce the influence of extreme values on this study.

Data sources include CSMAR, China National Intellectual Property Administration and the annual reports of major listed companies. The empirical research is mainly completed by Stata15.0 software. After the above processing, this paper finally got 33515 research samples.

3.2. Definition of Variables

Explained variables. innovation output, referring to other scholars' measurement methods, are measured by adding 1 to the number of patent applications and taking natural logarithm [5,6]. Representing the intermediate stage of technological transformation of innovation activities, it embodies the direct knowledge output and intellectual property accumulation of innovation activities.

The explanatory variable is the share pledge rate of the controlling shareholder, which is measured by the ratio of the number of shares pledged by the controlling shareholder at the end of the year to the number of shares held by the controlling shareholder itself, reflecting the proportion of its shares pledged and quantifying the pledge degree [7].

Control variables, combined with the existing literature, the selected control variables are [8]: enterprise size (Size), debt-to-asset ratio (Lev), net cash flow (Cfo), revenue growth rate (Growth), company age (Age), property rights nature (Soe), dummy variable for whether the positions of chairman and CEO are combined (Dual), shareholding ratio of the controlling shareholder (Top1), institutional investor shareholding (Jgtz).

In addition, in order to eliminate the interference of time trend and industry characteristics, the influence of Year and industry (Ind) on the empirical results is also controlled.

3.3. Model Specification

This paper will follow the approach of Li Changqing (2018) et al. to establish the following regression model as the basic regression model to examine the impact of the equity pledge of controlling shareholders on corporate innovation [9]:

$$Innovation_{i,t+1} = \alpha_1 + \alpha_2 Pledge_{i,t} + \sum_m \alpha_m CV_{i,t} + \sum Ind + \sum Year + \varepsilon_{i,t} \quad (1)$$

In formula (1), *i* represents the individual listed company and *t* represents the year. Corporate innovation (Innovation) is the dependent variable, measured by the number of patent applications. The core explanatory variable is the equity pledge of controlling shareholders (Pledge), measured by the pledge ratio of controlling shareholders. CV represents control variables, including firm size, debt-to-asset ratio, net cash flow, revenue growth rate, company age, ownership nature, whether the positions of chairman and CEO are combined, the shareholding ratio of controlling shareholders, and institutional investor shareholding. α_1 represents the intercept term, and ε is the random disturbance term. To reduce the impact of endogeneity and reverse causality, all explanatory variables and control variables are lagged by one period. The model also controls for the influence of year (Year) and industry (Ind) on the empirical results.

4. Empirical Analysis

4.1. Descriptive Statistics

Table 1. Descriptive Statistic

Variable	Number	Mean	Standard Deviation	Minimum	Median	Maximum
Patent	33515	3.09	1.71	0.00	3.22	7.26
Pld_rate	33515	0.06	0.14	0.00	0.00	0.83
Size	33515	7.63	1.23	4.93	7.53	11.11
Lev	33515	0.41	0.20	0.05	0.39	0.88
Cfo	33515	0.05	0.07	-0.15	0.05	0.24
Growth	33515	0.15	0.37	-0.52	0.10	2.25
Age	33515	2.98	0.32	1.39	3.00	4.25
Soe	33515	0.31	0.46	0.00	0.00	1.00
Dual	33515	0.32	0.47	0.00	0.00	1.00
Top1	33515	34.10	14.52	9.20	31.90	74.30
Jgtz	33515	42.69	24.96	0.34	43.91	90.89

The descriptive statistics of the main variables involved in the study are presented in Table 1. According to the results of the descriptive statistics, the mean of the number of patent applications (Patent) is 3.09, with a median of 3.22, which is higher than the average. This indicates that the majority of enterprises have a higher number of patent applications than the average, while a few extremely low values have pulled down the overall average. The minimum and maximum values are 0 and 7.26 respectively, with a standard deviation of 1.71, suggesting that the patent layout among enterprises is highly uneven and the technological innovation capabilities are significantly differentiated. Some enterprises can efficiently convert R&D into technological achievements, while a large number of enterprises face bottlenecks in the

conversion process. The mean of the equity pledge ratio of the controlling shareholder (Pld_rate) is 0.06, with a median of 0. Most pledge ratios are relatively low, but a few enterprises have a pledge ratio of up to 83% for their controlling shareholders, which may face a high risk of control transfer or market concerns about the stability of equity. The differences in pledge intensity among different enterprises are significant. In addition, the statistical values of control variables such as enterprise size (Size) are similar to previous studies, with no significant differences, indicating that the samples selected in this paper have high representativeness and credibility.

4.2. Analysis of Basic Regression Results

In order to study the influence of controlling shareholder's equity pledge on enterprise's innovation output, an empirical regression was conducted on the whole sample, and the regression results are shown in Table 2. Whether the control variable is added or not, the regression coefficient of the equity pledge rate to the innovation output of the enterprise is significantly negative at the level of 1%, which indicates that the deepening of the equity pledge degree of the controlling shareholder will significantly aggravate the inhibition on innovation.

Table 2. Regression result

	(1)	(2)
	Patent	Patent
Pld_dum		
Pld_rate	-0.819*** (-14.286)	-0.279*** (-5.661)
Size		0.652*** (96.611)
Lev		-0.080* (-1.898)
Cfo		-0.183* (-1.710)
Growth		0.188*** (10.226)
Age		-0.248*** (-10.364)
Soe		0.169*** (9.457)
Dual		0.033** (2.133)
Top1		-0.002*** (-3.726)
Jgtz		0.002*** (5.734)
_cons	3.134*** (367.844)	-1.199*** (-14.308)
Year	Yes	Yes
Ind	Yes	Yes
N	33515	33515
R2	0.287	0.497

*** p<0.01, ** p<0.05, * p<0.1

5. Summary

This study examines the impact of equity pledges on corporate innovation by systematically analysing A-share listed companies from 2013 to 2024. Findings indicate that controlling shareholders' equity pledges significantly inhibit corporate innovation activities. Under high pledge ratios, intensified resource constraints and agency conflicts suppress patent applications.

To effectively regulate controlling shareholders' equity pledge practices, mitigate their inhibitory effect on corporate innovation, and foster innovative development, the following policy recommendations are proposed at both governmental and corporate levels:

Government level. Regulatory bodies should spearhead efforts to refine market-based constraint mechanisms for equity pledges. Additionally, multiple measures should be implemented to broaden corporate financing channels, thereby effectively alleviating financing constraints on innovation activities. Finally, targeted policy support should be implemented based on corporate property rights, equity structures, and industry characteristics. For non-state-owned enterprises, focus should be placed on addressing resource gaps through 'subsidies + interest subsidies'. For state-owned enterprises, reform assessment mechanisms to emphasise long-term innovation indicators. Diversified financing models such as 'equity + debt' can also provide enterprises with more stable sources of innovation funding.

At the enterprise level. Enterprises must strive to improve their internal governance systems and enhance their risk resilience. They should also strengthen talent development and management. High-calibre R&D personnel form the backbone of technological innovation in listed companies. Only by accelerating the cultivation of top-tier talent can enterprises effectively elevate their technological innovation capabilities.

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