Equity pledge of major shareholders, quality of information disclosure and synchronization of stock price

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Abstract. The synchronization of stock price is an important index to measure the information of stock price. Compared with the countries with mature capital market, the synchronization of stock price in China is on the high side, and the fluctuation of stock price often presents the phenomenon of "rising and falling together". This paper studies the impact of pledge of major shareholders' equity on the synchronization of stock price, and further explores the role of information disclosure quality. Based on the data of China's A-share listed companies in 2013-2019, the empirical study shows that: there is a large shareholder equity pledge in enterprises, and the synchronization of stock price is higher, and with the increase of the proportion of large shareholder equity pledge, the impact is more significant; the quality of information disclosure plays a significant negative role in the relationship between the synchronization of large shareholder equity pledge and stock price, easing the impact of large shareholder equity pledge the impact on stock price synchronization.

1 Introduction

Equity pledge refers to the behavior that the shareholders of an enterprise pledge their equity to the bank to obtain loans. The loan process of equity pledge is simple, and restricted shares are also within the scope of pledge. Equity pledge has become a common financing method. According to wind database statistics, 1781 shareholders of A-share listed companies had equity pledge behavior in 2019, among which 109 shareholders' equity pledge ratio reached 100%. Although the pledge of stock right is the financing behavior of shareholders themselves, the controlling position of large shareholders will bring great influence to the decision-making of enterprises. According to the system of stock pledge, when the stock price of an enterprise falls to the closing line of pledge, the pledgee has the right to close the position of the Pledged Shares, which may lead to the control crisis of the company. Equity pledge also leads to the separation of equity control and cash flow, which aggravates the agency problem and weakens shareholders' expectation of maximizing stock price. The existing research on equity pledge mainly focuses on the stock price crash, earnings management¹, and has not yet examined the impact of large shareholder equity pledge from the perspective of share price synchronization. The stock price synchronization measures the relationship between the stock price change of a company and the average stock price change of the stock market and the industry. The higher the synchronicity of stock price, the more similar the change of stock price is to the change of industry and market as a whole, which reduces the efficiency of resource allocation through stock price, and limits the

ability of investors to identify the value of companies based on stock price.

Although major shareholders do not directly participate in the disclosure of stock price information, because they have absolute control over the company, if there is a motivation to empty the listed company due to stock pledge, they do not want investors to know more about the company, and the synchronization of stock price will increase; on the contrary, because of the rules of stock pledge, when the stock price falls to the closing line of pledge, major shareholders will lose control. In order to maintain its control position, the crisis of power will take various measures to avoid the decline of stock price, and the synchronization of stock price will decline.

The possible contributions of this paper are as follows: first, the previous research mainly focused on the stock price crash, and this paper mainly expanded the research of large shareholders' equity pledge from the perspective of stock price synchronization. From the perspective of capital market, it is more direct and meaningful to study equity pledge. Second, the paper calculates the quality of information disclosure from the perspective of investors, and more comprehensively expands the factors that affect the synchronization of stock price.

2 Theoretical analysis and research hypothesis

2.1 Synchronization of stock pledge and stock price of major shareholders

Major shareholder's equity pledge is a financing method for major shareholders to obtain cash from equity pledge.

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When the equity value drops below the loan amount obtained by pledge financing, major shareholders can choose to give up this part of equity and transfer the depreciated equity to financial institutions such as creditor bank. However, once shareholders' tunneling behavior is found, other shareholders will take actions to reduce the occurrence of interest encroachment. Therefore, when the major shareholders try to empty the listed company after the pledge, in order to avoid its behavior being detected by the external investors, it may reduce the special information of the enterprise and improve the synchronization of the stock price of the enterprise. However, some scholars have put forward the opposite opinion: when the equity price of an enterprise falls to the closing line, the shareholders need to supplement the pledge. If the pledge cannot be added, the equity will be forcibly disposed and the shareholders will lose the control². Under the background of strict IPO control in China, the shell resources of listed companies are very precious, and shareholders do not want to lose the control of listed companies. In order to stabilize the stock price of the company, the board of shareholders strives to improve the operating performance of the listed company. Based on the above analysis, the relationship between the pledge of major shareholders' equity and the synchronization of stock price is an empirical problem to be tested. This paper proposes the following hypothesis H1.

H1: the pledge of major shareholders' equity will increase the synchronization of stock price.

2.2 The regulatory role of information disclosure quality

If the quality of information disclosure of listed companies is high, external investors can learn more about the actual operation of the company. After the major shareholders pledge their shares, even if they have the motivation to empty the listed companies, it is difficult to implement the hollowing behavior in a more transparent information environment. In this case, the controlling shareholder's equity pledge financing funds are more likely to be used to support the development of listed companies, promote the listed companies to disclose more information to retain existing investors and attract new investors to join, so it can reduce the synchronization of stock prices. On the contrary, if the quality of information disclosure of listed companies is low, it is difficult for external stakeholders to detect the self-interest behavior of the company's insiders in time, which will help the growing shareholders to empty the motivation and ability of listed companies. In this case, the majority shareholders tend to hinder the disclosure of the company's special information after pledging their shares, which results in a higher degree of stock price synchronization. Therefore, this paper proposes hypothesis H2.

H2: the higher the quality of information disclosure is, the stronger the inhibition of stock price synchronization is.

3 Research design

As the data of equity pledge in CSMAR database started in 2013, this paper takes A-share listed companies in China from 2013 to 2019 as a sample, and the financial indicators and annual report data are all from CSMAR database, Resset database and wind database. In order to ensure the reliability of the follow-up empirical study, the original data were screened; (1) ST, ST* and enterprises with missing values were eliminated; (2) the important continuous variables were tail reduced by 1%. Finally, the annual observations of 19214 enterprises were obtained.

3.1 Stock price synchronization (SYN)

Roll³ proposed that the macro environment, industry environment and internal characteristics of the company jointly affect the change of the company's stock price. The synchrony of stock price measures the relationship between the change of stock price and the change of average stock price in stock market and industry. The existing measurement of stock price synchronization is generally based on the market return model. Using the algorithm of Xu⁴ and Gu⁵ for reference, the stock price synchronization is calculated:

Return to market weekly yield:

$$R_{i,w,t} = \alpha_0 R_{m,w,t} + \alpha_1 R_{m,w-1,t} + \alpha_2 R_{i,w,t} + \alpha_3 R_{i,w-1,t} + \varepsilon_{i,w,t} \quad (1)$$

$R_{i,w,t}$ is the rate of return on investment of i stock's cash in w weeks of t year, $R_{m,w,t}$ is the weighted average return on the market value of all stocks in circulation in the w week of year t ; $R_{i,w,t}$ is the weighted average return on the market value of circulation of the industry where I stock is located (excluding i stock) in W weeks of t year, and the fitting coefficient R^2 is obtained

$$SYN_{i,t} = \ln(R_{i,t}^2 / (1 - R_{i,t})) \quad (2)$$

By logarithmic transformation of R^2 , we get the measurement index syn of stock price synchronization. The larger SYN is, the greater the correlation between the change of individual stock price and the change of market and industry average stock price is, and the higher the synchronization of stock price is.

3.2 Major shareholder equity pledge (PLED)

Through the collection of annual report data of listed companies, two methods are selected for measurement: first, if there is a major shareholder's equity pledge, the pled value is 1, otherwise it is 0; second, the proportion of the major shareholder's equity pledge is used to quantify the degree of equity pledge. The larger the pledge, the greater the degree of major shareholder's equity pledge.

3.3 Information disclosure quality (KV)

The existing literature for the measurement of information disclosure quality is mainly the rating of the regulatory agencies on the quality of enterprise information disclosure. This measurement method mainly focuses on the perspective of the regulatory agencies. Zhai⁶ believes that the KV index, the influence coefficient of trading

volume on the yield, can reflect the market information. The higher the quality of information disclosure of the company, the greater the dependence of investors on the information disclosure of the enterprise, and the less the impact of trading volume on the yield. This measurement method measures the degree of dependence on information disclosure from the perspective of investors, which is a variable that can comprehensively measure the quality of information disclosure of listed companies.

When using *KV* model, because of the different time span of the data used, different literature will use different proportion to enlarge λ value, and *kV* index is used to reflect the quality of information disclosure, which must follow the principle of the same market and the same period. Therefore, different researchers construct *KV* index by amplifying λ value completely according to the research needs and regression results. In this paper, $KV = \lambda \times 10^8$ is defined in accordance with Xu Shoufu7.

the following models are used for calculation:

$$\ln[(P_t - P_{t-1})/P_{t-1}] = \lambda_0 + \lambda(VOL_0 - VOL_0 - 1) + \varepsilon_i \quad (3)$$

3.4 Control variables

In order to control the impact of other factors on the empirical results, the following control variables are set. The larger the age of listed companies is, the higher the social awareness is. This paper uses the natural pairs of listed companies to measure it. The debt paying ability (*LEV*) is calculated by the asset liability ratio, which is the measurement of leverage ability. The return on net assets (*ROE*) is the financial index to analyze the efficiency of capital use. The ownership concentration (*TOP*) is expressed by the proportion of the largest shareholder; The annual average turnover rate (*TURN*) represents the liquidity of the stock; the nature of the company's equity (*SOE*), it is confirmed that the degree of earnings management of the listed company will be affected by the property rights of the enterprise. When the listed company is a state-owned enterprise, the *SOE* value is 1; the larger the size of the listed company is, the more scale economy it has, and the logarithm of the total assets of the company represents the size of the listed company.

3.5 Research model

This paper constructs a model (4) (5). The dependent variable *SYN* indicates the synchronization of stock price, the independent variable *PLEDD* in the model (4) indicates whether there is equity pledge for major shareholders, and *PLEDG* indicates the proportion of equity pledge for major shareholders. This model tests hypothesis 1. In model (5), *KV* represents the quality of information disclosure, which tests hypothesis 2.

$$SYN_{it} = \alpha_0 + \alpha_1 PLEDD_{it}/PLEDG_{it} + \alpha_2 AGE_{it} + \alpha_3 LEV_{it} + \alpha_4 ROE_{it} + \alpha_5 TOP_{it} + \alpha_6 TURN_{it} + \alpha_7 SOE_{it} + \alpha_8 SIZE_{it} + \alpha_9 KV_{it} + \varepsilon_{it} \quad (4)$$

$$SYN_{it} = \gamma_0 + \gamma_1 PLEDD_{it}/PLEDG_{it} + \gamma_2 PLEDD_{it}/PLEDG_{it} \times KV_{it} + \gamma_3 KV_{it} + \gamma_4 AGE_{it} + \gamma_5 LEV_{it} + \gamma_6 ROE_{it} + \gamma_7 TOP_{it} + \gamma_8 TURN_{it} + \gamma_9 SOE_{it} + \gamma_{10} SIZE_{it} + \varepsilon_{it} \quad (5)$$

4 Theoretical analysis and research hypothesis

4.1 Descriptive statistic

The descriptive statistics of relevant variables. The mean value of *SYN* is -0.284, and the standard deviation is 0.867, which indicates that there are great differences in equity synchronization. The mean value of *PLEDD* is 0.373, and 37.3% of enterprises have the situation of *PLEDD*. The mean value of *PLEDG* is 0.218, the average pledge proportion of major shareholders of the sample enterprise is 21.8%, and the maximum value of *PLEDG* is 1, indicating that there is a situation of 100% Pledged Shares of major shareholders. Among the control variables, *AGE* and *LEV* are 2 889,044; the mean value of *roe* is 0.0314; the mean value of *turn* is 2.777, which is relatively active; the mean value of *SOE* is 0.325, which indicates that there are more private listed companies than state-owned enterprises in this sample; the mean value of *size* is 22.22.

4.2 Correlation analysis

According to the test results of correlation analysis, *SYN*, *PLEDD* and The correlation coefficients of *PLEDG* are 0.039 and 0.055, which are significant at the level of 1%, which are in line with the expected assumption. In the test of correlation coefficient, the absolute value of the coefficient is relatively small, no more than 0.8 coefficient, the model does not have obvious multicollinearity problem.

4.3 Regression analysis

Based on the model (3), multiple regression tests the relationship between major shareholder equity pledge and stock price synchronization, as shown in columns 1 and 2 of Table 4. The first column in Table 1 describes *PLED* on stock price synchrony (*SYN*), with a regression coefficient of 0.152, which is significant at the level of 1%, indicating that enterprises with large shareholder equity pledge disclose less characteristic information and share price synchrony is higher; the second column describes the impact of large shareholder equity pledge ratio (*PLEDG*) on share price synchrony (*SYN*). The regression coefficient is 0.145 and the coefficient is significant at the level of 1%, which indicates that the larger the proportion of major shareholders' equity pledge, the higher the synchronization of stock price, and the serious homogenization of information disclosure. The above empirical results show that the higher the proportion of pledge, the more inclined to disclose homogeneous information, investors can not get sufficient information from the information disclosure, which makes the stock price change more inclined to the market information, that is to say, increase the stock price synchronization. This result verifies the hypothesis H1.

Table1. Multiple linear regression results

	(1) <i>SYN</i>	(2) <i>SYN</i>	(3) <i>SYN</i>	(4) <i>SYN</i>

<i>PLEDD</i>	0.152*** (7.91)			
<i>PLEDG</i>		0.145*** (5.10)		
<i>PLEDD</i> $\times KV$			0.486*** (5.20)	
<i>PLEDG</i> $\times KV$				0.354** (2.08)
<i>KV</i>	-0.83*** (-16.65)	-0.34*** (-6.78)	-1.01*** (-16.64)	-0.40*** (-5.49)
<i>AGE</i>	-0.10*** (-4.97)	-0.11*** (-5.34)	-0.10*** (-4.91)	-0.11*** (-4.91)
<i>LEV</i>	-0.00347 (-0.30)	-0.00691 (-0.59)	-0.00376 (-0.33)	-0.14*** (-3.68)
<i>ROE</i>	0.00248 (0.52)	0.00403 (0.85)	0.00244 (0.52)	0.00309 (0.65)
<i>TOP</i>	0.006*** (12.47)	0.007*** (13.87)	0.006*** (12.48)	0.007*** (13.88)
<i>TURN</i>	0.033*** (11.43)	0.026*** (8.82)	0.033*** (11.42)	0.026*** (8.58)
<i>SOE</i>	-0.0123 (-0.81)	-0.0281* (-1.83)	-0.0117 (-0.77)	-0.0235 (-1.52)
<i>SIZE</i>	0.040*** (6.65)	0.019*** (3.17)	0.040*** (6.69)	0.0263*** (4.03)
N	19214	19214	19214	19214
F	77.76***	47.25***	42.84***	70.19***
Adj- <i>R</i> ²	0.1791	0.1613	0.0866	0.0824

Based on hypothesis 2, the model (4) tests the regulatory effect of information disclosure quality on the synchronization of stock price by pledge of major shareholders' equity. The results in the third column of Table 1 show that the regression coefficient of the cross item (*PLEDD* $\times$ *KV*) between the pledge of major shareholders' equity and the quality of information disclosure is 0.486, and the significance level is 1%. Because the larger *KV* index is, the worse the quality of information disclosure is, the empirical results confirm that the lower the quality of information disclosure is, the more significant the positive relationship between the equity pledge of large shareholders and the synchronization of corporate stock price is; the results in column 4 of Table 1 show that the regression coefficient of the cross item (*PLEDG* $\times$ *KV*) between the proportion of equity pledge of large shareholders and the quality of information disclosure is 0.354, the significance level is 1%, and the quality of information disclosure is large. The negative relationship between shareholders' equity pledge and stock price synchronization verifies the expectation of hypothesis H2.

5 Conclusion and Enlightenment

This paper examines the relationship between the pledge of major shareholders' equity and the synchronization of stock price, and the regulatory role of information disclosure quality. The research shows that the greater the degree of pledge, the greater the synchronization of stock price; in addition, the quality of information disclosure plays a significant negative role in the relationship between the pledge process and the synchronization of stock price.

Based on the above research, we can get the following enlightenment for enterprise operation and capital market supervision: the pledge of major shareholders' equity will improve the synchronization of stock price and damage the information efficiency of capital market. Regulators

can strengthen the requirements of information disclosure laws and regulations of listed companies, improve the transparency of enterprise information, provide a good information environment for equity pledge to play a role in alleviating financing difficulties, and mitigate the damage of major shareholders' equity pledge to the information efficiency of the capital market. It provides a policy basis for creating a transparent market information environment and promoting listed companies to achieve long-term stable, sustained and healthy growth of market value by improving the quality of information disclosure.

References

1. Xie Deren, Liao Ke, Zheng Dengjin. Implicit choice of accounting policies for equity pledge and development expenditure of controlling shareholders [J]. Accounting research, 2017 (003): 30-38.
2. Li Zengquan, Ye Qing, he Hui. Enterprise Association, information transparency and stock price characteristics [J]. Accounting research, 2011 (01): 46-53 + 97.
3. Roll G R . The Fiscal and Monetary Linkage Between Stock Returns and Inflation[J]. The Journal of Finance, 1983, 38(1):1-33.
4. Xu N , Chan K C , Jiang X , et al. Do star analysts know more firm-specific information? Evidence from China[J]. Cfa Digest, 2013, 37(1):45-47.
5. Gul F A , Kim J B , Qiu A . Ownership Concentration, Foreign Shareholding, Audit Quality, and Stock Price Synchronicity: Evidence from China[J].Journal of Financial Economics,2014,114(2):239-255.
6. Zhai Guangyu, Wu Lichao, Tang Dapeng. Does the shareholding of the Secretary of the board of directors of China's listed banks reduce the quality of information disclosure? -- An Empirical Analysis Based on the quarterly data of 2007-2012 [J]. Economic review, 2014 (02): 127-138.
7. Xu Shoufu, Xu longbing. Information disclosure quality and capital market valuation bias [J]. Accounting research, 2015 (01): 42-49 + 98.