Intermediary Organization Marketization, Corporate Governance, and Financing Efficiency

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Abstract. Based on the non-financial companies listed in Chinese A-share market from 2016 to 2020, this paper empirically analyzes the impact of intermediary organization marketization on financing efficiency, and utilizes corporate governance as an intermediary variable to test the underlying mechanisms. By using methods such as principal component analysis to construct key variables, we prove that the marketization of intermediary organizations, corporate governance and financing efficiency have significant positive correlations. Better internal and external supervision mechanisms will lead to higher financing efficiency in a company. Moreover, corporate governance shows the intermediary effect in the influence from the intermediary organization marketization to the financing efficiency, that is, the marketization of intermediary organizations indirectly affects the financing efficiency of companies through the quality of corporate governance.

Keywords: Market intermediary organization · Corporate governance · Financing efficiency

1 Introduction

The issue of corporate financing efficiency has drawn more and more attention from scholars, investors, managers, and so on. The researches on the financing efficiency of listed companies are mostly depended on the measurements based on DEA model, the entropy method and so on. In terms of its influencing factors, those factors are mostly analyzed from the aspect of companies' financial status. In recent years, some scholars started to study the relationship between corporate financing efficiency and corporate governance. They argue that the higher the quality of corporate governance, the lower the cost of equity capital and debt capital of the company, which leads to higher financing efficiency of the company. In addition to the relevant factors at the enterprise level, changes

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in the external governance environment of the enterprise are also important affecting factors of the efficiency of enterprise financing. With the frequent occurrence of financial fraud in listed companies, the responsibilities of market intermediary organizations such as accounting firms and auditing firms have attracted attention.

After the renewed China's Securities Law was implemented in 2020, the responsibilities and illegal norms of relevant intermediary organizations becomes clearer, which increases the status of intermediary organization. "The issues related to the government belongs to the government, while the issues related to the market cases belongs to the market." The full implementation of the registration system surrounding the key factor, information disclosure, depends on confirming the intermediary organization's crucial role as the "gatekeeper". However, limited literature focuses on the relation among the marketization of intermediary organizations, corporate governance and financing efficiency. Generally speaking, the higher the degree of marketization of intermediary organizations, the more effective the external supervision mechanism formed, which can restrain the agency cost of enterprises, alleviate the information asymmetry between enterprises and investors, and further affect the financing capacity and investment and financing decision-making behavior of enterprises. Therefore, we first study the impact of the marketization of intermediary organizations on financing efficiency of companies, and then explore whether intermediary organizations affect corporate financing efficiency through corporate governance. The innovation of this paper is the introduction of the representational variable of the marketization of intermediary organizations, studying its relationship with corporate financing efficiency and exploring its underlying mechanism, which fills the gap in related literature on intermediary organizations and corporate financing efficiency.

2 Theoretical Analysis and Research Hypotheses

2.1 Intermediary Organizations Marketization and Financing Efficiency

An intermediary organization is an intermediary institution that provides services such as agency, information technology to the clients with professional knowledge and skills. Wang and Lv (2013) [1] believe that the higher the degree of marketization of intermediary organizations, the better the external supervision mechanism of the capital market. Therefore, the information disclosure of the capital market will be more purified, and the healthy development of the capital market will be promoted, which leads to higher capital market financing efficiency. At present, Chinese marketization process is constantly advanced, especially in the deepening reform of the capital market. Chinese capital market reform has taken a crucial step based on the pilot study of the registration system for STAR Market (Sci-Tech innovAtion boaRd), the implementation of the renewed Securities Law in 2020, the establishment of Beijing Stock Exchange, and lastly, the comprehensive promotion of the registration system. However, to make sure that the resource allocation function of the capital market could work as designed, the intermediary organization needs to play its role. Therefore, Li and Li (2015) [2] pointed out that if the intermediary organization could accelerate the marketization and maintain its independence while developing the capital market, its regulating role between investors

and enterprise managers could be displayed, which further ensure that enterprises do make reasonable investment and financing decisions.

Previous literature shows that the marketization of intermediary organizations can alleviate the long-standing principal-agent problem of enterprises to a certain extent, in which affects the cost of equity capital and debt capital of enterprises to improve the efficiency of enterprise financing. The establishment of the registration system puts forward higher requirements on the independence and service quality of market intermediary organizations, and then the information output of intermediary organizations becomes an important basis for the market to measure whether enterprises are worthy of investment, which affects the investment and financing behavior of enterprises to a certain extent. Therefore, higher the marketization of intermediary organizations will alleviate the information asymmetry between external investors and internal management to a certain extent, which reduce the financing constraints of enterprises, and further improve the financing efficiency. Based on the previous analysis, this paper proposes Hypothesis 1.

Hypothesis 1: The marketization of intermediary organizations will help improve the efficiency of corporate financing.

2.2 Correlations Between Intermediary Organization, Corporate Governance, and Financing Efficiency

Scholars focus a lot on the role of intermediary organizations in corporate governance and corporate financing. They believe that the high cost of equity capital of enterprises is partly due to weak liquidity of stock caused by information asymmetry. With the continuous improvement of marketization, the information dissemination and supervision functions of intermediary organizations such as media and accountants can be effectively exerted, which reduces the high equity capital and agency problems of enterprises. Many scholars also carried out research on the improvement of corporate governance and market efficiency by intermediary organizations in China. Li (2005) [3] points out that the higher the degree of marketization is, the more independent the certified public accountants could maintain their business, so as to alleviate the problem of principal-agent of enterprises and alleviate financing constraints. Dong (2016) [4] believes that information intermediary organizations such as the media can transmit corporate information to uninformed people in the capital market, which affects the financing ability of enterprises. Xia and Fan (2019) [5] discuss the role of "gatekeeper" of intermediary organizations based on the implementation of the registration system on the Sci-Tech Innovation Board. They believe that to transparent the company information disclosure and speed up the developmental process of market intermediary organizations, the role and responsibility of intermediary organizations must be clarified.

Under the modern enterprise system, due to the separation of ownership and management rights, managers usually do not follow the wishes of shareholders, resulting in a typical principal-agent problem in economics. As an internal supervision with check and balance mechanism, corporate governance can effectively alleviate agency conflicts between shareholders and managers, which restrain agency costs. In fact, in order to reduce the principal-agent problem in enterprises, both internal governance and external

supervision are required to restrict the behavior of managers. As a "third-party organization" connecting the government, the market and enterprises, the marketization degree of intermediary organizations affects information disclosure, investment decisions, and capital structure of enterprises. The higher degree of marketization of intermediary organizations is, the more standardized their functions are, and more they act as an external supervision while maintaining business independence and improving service quality. As the previous process has been done, it helps enterprises to improve their ability to obtain funds while improving corporate governance and capital allocation efficiency. Therefore, this paper proposes Hypothesis 2.

Hypothesis 2: Corporate governance plays an intermediary role in the process of intermediary organizations affecting corporate financing efficiency.

3 Research Method and Design

3.1 Sample Selection and Data Sources

We take the non-financial companies listed in Chinese A-share market from 2016 to 2020 as the research subjects, and empirically test the correlations between the development and improvement of market intermediary organizations, corporate governance, and financing efficiency as external governance variables. In order to ensure the rationality of the empirical results, the sample data selected in this paper only include non-financial listed companies, which excludes the samples of listed companies with missing data, ST, ST* and listing time less than one year. At the same time, in order to exclude the influence of outliers on the empirical results, this paper performs a Winsorize processing of 1% on all continuous variables, and finally obtains 13043 sample observations. The data used are obtained from the Guotai'an database (CSMAR), the Ruisi database (RESSET), and the WIND database.

3.2 Definition of Variables

3.2.1 Financing Efficiency (Fe)

Existing literature mainly uses two kinds of methods to measure financing efficiency, one is using statistical methods such as data envelopment method (DEA) and entropy method to measure financing efficiency; and the other is constructing the calculation formula to derive the financing efficiency value after redefining it. Due to the intersection of the selected indicators and control variables in the measurement of the first method, the empirical results are unreasonable. Therefore, in recent years, most scholars have used the second type of methods to study financing efficiency. Based on that, this paper selects the second method and follows Zhang and Zhao (2015) [6] to define financing efficiency as a combination of financing income, financing risk and financing costs. The specific formula is as follows:

$$Fe = FI \times [1 - Fc \times (1 + Fr)] \tag{1}$$

where Fe is financing efficiency, FI is financing income, Fc is financing cost, and Fr is financing risk. Taking into account that the external financing sources and capital

Table 1. Measurement variables and definitions of financing efficiency.

Variables	Symbols	Measurement variables and calculation formula
Financing income	*FI*	Return on Total Assets (ROA) = Net Income before Interest and Taxes / Total Assets.
Financing costs	*Fc*	Weighted Average Cost of Capital (*wacc*) = [Interest Rate × (1-Tax Rate) × Debt Capital + Cost of Equity Capital Rate × Equity Capital]/Total Assets. The cost of equity capital is calculated using the CAPM model.
Financing risk	*Fr*	Combined Leverage = Financial Leverage × Operating Leverage.

Table 2. KMO and Bartlett sphericity test.

KMO Sampling Suitability Quantity		0.608
Bartlett Spherical Test	Approximate chi-square	13650.61
	Degrees of freedom	21
	Salience	0

use of enterprises, to fully reflect the financing efficiency, this paper uses ROA to measure financing income (*FI*), the weighted average cost of capital (*wacc*) to measure the financing cost (*Fc*), and the comprehensive leverage to measure the financing risk (*Fr*). The specific calculation formulas and variable definitions are shown in Table 1.

3.2.2 Internal Corporate Governance (G)

In order to reflect the internal governance of the company, this paper follows Zhou et al. (2020) [7] to select 7 indicators from three aspects of incentive, supervision and decision-making, and uses the principal component analysis method to construct the corporate governance index G. Among them, the incentive index is measured by ratio of executive compensation to executive shareholding. The supervision indicators include two kinds of measurements: one is the board supervision index, which is expressed by the proportion of independent directors and the size of the board of directors; the other is the equity structure index, which is expressed by the institutional shareholding ratio and the degree of equity balance. The decision-making index is measure by whether the chairman and the general manager are combined. As Table 2 shows, the results of KMO and Bartlett sphericity test show that the selected indicators are suitable for factor analysis.

Using stata16 to conduct factor analysis on the 7 indicators of the sample object, the results are shown in Table 3. According to the results, the first three variables in the table are the main component factors, the maximum variance is 0.303, the minimum is 0.146, and the cumulative variance contribution rate is 0.648, which can effectively explain the

Table 3. Results of principal component analysis.

Variable factor	Rotational load sum of squares			Composition matrix		
	Eigenvalue	Variance	Cumulative variance	1	2	3
X_1	2.12	0.303	0.303	−0.09	0.089	0.763
X_2	1.388	0.198	0.501	0.448	−0.028	0.018
X_3	1.025	0.146	0.648	−0.116	0.602	0.137
X_4				−0.008	−0.517	0.053
X_5				−0.433	0.06	0.14
X_6				0.333	−0.064	0.565
X_7				0.2	0.131	0.019

total variance of the original variables. Therefore, according to the composition matrix results, the following three equations can be obtained.

$$F_1 = -0.090X_1 + 0.448X_2 - 0.116X_3 - 0.0084X_4 - 0.433X_5 + 0.333X_6 + 0.200X_7 \tag{2}$$

$$F_2 = 0.089X_1 - 0.028X_2 + 0.602X_3 - 0.517X_4 + 0.060X_5 - 0.064X_6 + 0.131X_7 \tag{3}$$

$$F_3 = 0.763X_1 + 0.018X_2 + 0.137X_3 + 0.053X_4 + 0.140X_5 + 0.565X_6 + 0.019X_7 \tag{4}$$

Using the factor weighted score method, the corporate governance is comprehensively evaluated with the rotation load square sum variance in the principal component analysis result as the weight, and the score value of the comprehensive level of corporate governance is calculated by the linear combination of the above three factors.

$$G = (0.303F_1 + 0.198F_2 + 0.146F_3)/0.648 \tag{5}$$

3.2.3 Index of Intermediary Organizations Marketization (DMI)

This variable is represented by the developmental level of market intermediary organizations in three-level indicators under the marketization index of Chinese provinces proposed by Fan Gang and Wang Xiaolu. As well as the degree of perfection, this indicator refers to the changes in the number and service conditions of market intermediaries such as accountants, lawyers, auditors, credit rating agencies and various industry associations. Since this indicator is only updated to 2019, according to the current marketization situation in China, this paper follows Zhao et al. (2019) [8] and uses the average growth rate of previous years to predict the data in 2020.

3.2.4 Control Variables

In order to ensure the reliability of the results, this paper also introduces enterprise-level control variables, such as asset-liability ratio (*Lev*), operating income growth rate (*Grow*), degree of deleveraging (*Gong*), operating cash flow (*Cash*), book-to-market ratio (*MB*), nature of property rights (*Soe*), year (*Year*), and industry (*Industry*) dummy variables.

3.3 Model Construction

To test the hypotheses, this paper constructs the following models.

$$Fe = \beta_0 + \beta_1 DMI_{i,t} + \beta_i Control_{i,t} + \varepsilon_{i,t} \tag{6}$$

$$G = \beta_0 + \beta_1 DMI_{i,t} + \beta_i Control_{i,t} + \varepsilon_{i,t} \tag{7}$$

$$Fe = \beta_0 + \beta_1 G_{i,t} + \beta_2 DMI_{i,t} + \beta_i Control_{i,t} + \varepsilon_{i,t} \tag{8}$$

Equation (6) is the model equation corresponding to Hypothesis 1. Equation (7) and Eq. (8) are the model equations corresponding to Hypothesis 2.

4 Analysis of Empirical Results

4.1 Descriptive Statistics

Table 4 shows the descriptive statistics for the empirical variables in this paper. Specifically, financing efficiency (*Fe*) is all negative, with a maximum value of −0.030, a mean value of −0.270, and a median value of −0.230. The maximum value of internal corporate governance (*G*) is 2.460, the minimum value is −2.070, and the mean value is 0.040, which indicates that the quality of internal governance varies widely among companies. The maximum value of degree of development of market intermediary organization (*DMI*) is 10.000 and the minimum value is 1.410, indicating that there is a large difference in the degree of development of market intermediary organization in the regions where each company is located.

As for the control variables, the maximum and minimum values of asset-liability ratio (*Lev*) are 0.050 and 0.860, respectively, showing that there are differences in the capital structure of each company. The mean value of growth indicator of operating income growth (*Grow*) is 0.160; the mean values of deleveraging degree (*Gong*), operating cash flow (*Cash*), book-to-market ratio (*MB*) are 0.060, 0.050 and 0.350, respectively. The mean values of property rights (*Soe*) is 0.31, and the median value is 0, indicating that half of the sample companies are non-state enterprises.

Table 4. Descriptive statistics of variables.

Variable	Observations	Mean	P50	S.D.	Min	Max
Fe	13043	−0.270	−0.230	0.200	−1.690	−0.030
G	13043	0.040	−0.040	1.030	−2.070	2.460
DMI	13043	6.380	6.700	1.850	1.410	10.000
Lev	13043	0.410	0.400	0.190	0.050	0.860
Grow	13043	0.160	0.090	0.270	−0.190	1.790
Gong	13043	0.060	0.010	0.290	−0.570	1.600
Cash	13043	0.050	0.050	0.070	−0.160	0.250
MB	13043	0.350	0.340	0.150	0.070	0.780
Soe	13043	0.310	0	0.460	0	1

Table 5. Correlation analysis results of empirical variables.

	Fe	G	DMI	Lev	Grow	Gong	Cash	MB	Soe
Fe	1								
G	0.159***	1							
DMI	0.078***	0.084***	1						
Lev	−0.300***	−0.286***	−0.030***	1					
Grow	−0.040***	0.137***	0.009	0.043***	1				
Gong	0.055***	0.126***	0.000	0.024***	0.242***	1			
Cash	−0.257***	−0.056***	0.022**	−0.166***	−0.086***	−0.069***	1		
MB	0.135***	0.042***	−0.004	−0.410***	−0.100***	−0.060***	−0.003	1	
Soe	−0.102***	−0.523***	−0.079***	0.257***	−0.168***	−0.113***	−0.022**	0.020**	1

4.2 Correlation Analysis

In order to prevent the existence of serious multicollinearity relationships among the variables, correlation analysis was conducted before regressing, and the results are as follows. As shown in Table 5, the correlation coefficients of all variables are below 0.6, which indicates that there is no serious multicollinearity relationship between the variables. In addition, the *G* and *DMI* correlation coefficients were all significantly positively correlated at the 1% level, which initially verified the research hypothesis proposed in this paper.

4.3 Empirical Results

4.3.1 Intermediary Organization Development and Financing Efficiency

Hypothesis 1 is first tested by regressing Eq. (6) and the regression results are as follows. As shown in column (1) of Table 6, when excluding all control variables, intermediary

Table 6. Regression results of correlations between intermediary organizational development and financing efficiency.

Variables	(1) *Fe*	(2) *Fe*
DMI	0.0037*** (0.0009)	0.0034*** (0.0008)
Lev		−0.3186*** (0.0120)
Grow		−0.0626*** (0.0075)
Gong		0.0481*** (0.0052)
Cash		−0.7488*** (0.0275)
MB		0.0986*** (0.0117)
Soe		0.0209*** (0.0037)
Constant	−0.2151*** (0.0113)	−0.0800*** (0.0127)
Year effects	Control	Control
Industry effects	Control	Control
R-squared	0.1755	0.3214
Observations	13043	13043

organizational development and financing efficiency are significantly positively correlated at the 1% level. This indicates that the higher the level of corporate governance, the higher the efficiency of corporate financing. After the inclusion of control variables, the significant relationship between intermediary organizational development and financing efficiency does not change and the estimated coefficient is 0.0034, which is still positive. Therefore, Hypothesis 1 is verified.

4.3.2 Market Intermediary Organizations Development, Corporate Governance, and Financing Efficiency

We use corporate governance as a mediating variable to explore the underlying mechanism of intermediary organization development influencing financing efficiency. The regression models are Eq. (7) and Eq. (8) and the results are presented in Table 7. From columns (1) and (2) in Table 7, the estimated coefficients of *DMI* and *G* are positive and significant at the 1% level, which indicates that the higher the degree of marketization of market intermediary organizations, the higher the quality of intermediary organization services, and the stricter the external supervision mechanism constructed by these intermediary organizations, thus forcing enterprises to accelerate corporate governance and

Table 7. Regression results of intermediary effects.

Variables	(1) *G*	(2) *G*	(3) *Fe*
G			0.0030* (0.0017)
DMI	0.0230*** (0.0049)	0.0115*** (0.0043)	0.0034*** (0.0008)
Lev		−0.8822*** (0.0513)	−0.3160*** (0.0122)
Grow		0.1444*** (0.0287)	−0.0630*** (0.0075)
Gong		0.1962*** (0.0269)	0.0475*** (0.0052)
Cash		−1.0802*** (0.1206)	−0.7456*** (0.0276)
MB		0.0306 (0.0597)	0.0986*** (0.0117)
Soe		−0.9193*** (0.0162)	0.0236*** (0.0041)
Constant	0.0623 (0.0965)	0.6821*** (0.0903)	−0.0820*** (0.0128)
Year effects	Control	Control	Control
Industry effects	Control	Control	Control
R-squared	0.1648	0.3512	0.3215
Observations	13043	13043	13043

improve corporate governance. As shown in column (3), the coefficient of corporate governance is significant at the 10% level, indicating that corporate governance is positively related to financing efficiency; and under the control of corporate governance, *DMI* is still significantly positively related to financing efficiency. In summary, the results show that corporate governance plays a partial mediating effect in the influence marketization degree of intermediary organizations on financing efficiency.

5 Robustness Tests

Since the data of intermediary organizations marketization changed the calculation base period since 2017, to test the robustness of the empirical results, we consider the comparability and availability of the sample data and thus exclude the data from 2016 to 2020. At the same time, the return on invested capital (ROIC) was used as the substitute variable of ROA to recalculate the value of financing efficiency and perform regression according to the above process. The regression results are shown in Table 8. Columns (1)

Table 8. Results of robustness tests.

Variables	(1) *Fe*	(2) *Fe*	(3) *G*	(4) *G*	(5) *Fe*
G					0.0049** (0.0020)
DMI	0.0038*** (0.0011)	0.0030*** (0.0010)	0.0231*** (0.0064)	0.0113** (0.0056)	0.0029*** (0.0010)
Lev		−0.3929*** (0.0134)		−0.8930*** (0.0687)	−0.3885*** (0.0136)
Grow		−0.0027 (0.0083)		0.2412*** (0.0430)	−0.0039 (0.0084)
Gong		0.0507*** (0.0056)		0.1851*** (0.0358)	0.0498*** (0.0056)
Cash		−0.7723*** (0.0315)		−0.9835*** (0.1583)	−0.7674*** (0.0316)
MB		0.1420*** (0.0134)		0.1431* (0.0780)	0.1413*** (0.0134)
Soe		0.0157*** (0.0044)		−0.9241*** (0.0209)	0.0203*** (0.0048)
Constant	−0.2458*** (0.0133)	−0.1321*** (0.0155)	0.1030 (0.1172)	0.6042*** (0.1117)	−0.1351*** (0.0156)
Year effects	Control	Control	Control	Control	Control
Industry effects	Control	Control	Control	Control	Control
R-squared	0.1582	0.3839	0.1606	0.3514	0.3843
Observations	8000	8000	8000	8000	8000

and (2) show the regression results of the correlations between degree of intermediary organization development and financing efficiency. The DMI coefficient shows that it is still significantly positive with financing efficiency at the 1% level, which verifies hypothesis 1 and confirms the robustness of regression results. Columns (3), (4), and (5) are the tests of mediating effect, and corporate governance still plays partly mediating effect in the influence of the degree of intermediary organization development on financing efficiency, which verifies hypothesis 2 and confirms the robustness of the regression results.

6 Conclusion

This paper combines the current focus on corporate governance and the return of the role of 'gatekeeper' under the implementation of China's new Securities Law. Firstly, we study the influence of the degree of development of intermediary organizations on financing efficiency of companies. Secondly, we test whether the degree of development

of intermediary organizations affects corporate financing efficiency through corporate governance, by using corporate governance as a mediating variable.

The results show that, the quality of corporate governance affects its financing efficiency, and the higher the quality of corporate governance, the better the financing efficiency of companies. Besides, there is significantly positive relationships between the degree of marketization of intermediary organizations, the financing efficiency and governance level of enterprises. Moreover, the regression results show that the effects of corporate governance and the degree of development of intermediary organizations on financing efficiency are basically the same, which indicates that the external governance environment is as important as the internal governance mechanism for improving financing efficiency. What's more, the regression results of intermediation effect show that corporate governance plays an intermediary role in the influence of the development of intermediary organizations on the financing efficiency of enterprises, and the marketization of intermediary organizations can force enterprises to improve their own management and thus improve the financing efficiency. Therefore, as the current capital markets steps into the reformation called 'deep water zone', to improve the financing efficiency of external enterprises, the enterprises needed to continuously improve their internal governance structures while strengthen the external supervision mechanism.

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