

Internal Control Information Disclosure and Debt Financing Efficiency

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Abstract. In this paper, we select the panel data of A-share listed companies on the main board of Shanghai and Shenzhen Stock Exchange from 2010 to 2020 as our research object, and empirically tests the significance and heterogeneity of the effect of internal control information disclosure on the improvement of debt financing efficiency. Our findings suggest that whether it is benchmark regression test or instrumental variable method test, the improvement of the quality of internal control information disclosure has a very significant positive effect on the efficiency of debt financing of listed companies. Further research found that compared with non-state-controlled listed companies, state-controlled listed companies can obtain higher positive effects. Therefore, our research suggests that listed companies should be gradually guided to pay more attention to improving the quality of their disclosure of internal control information. At the same time, government should speed up the perfection of regulations of corporate's internal control, and strengthen the supervision of corporate's internal control information disclosure, so as to ensure economic security and maintain the stability of capital market.

Keywords: Debt financing efficiency, Internal control, Information disclosure, Heterogeneity analysis.

1. Introduction

Financing efficiency is a reflection of the comprehensive ability of enterprises to raise funds and use funds to obtain income. Improving financing efficiency plays a vital role in maintaining the normal operation of enterprise management activities, improving market competitiveness and promoting sustainable development. Debt financing is one of the most important methods for external financing of the company, so the efficiency of debt financing also has a significant impact on improving company's operating performance and ensuring the company's sustainable development. Song and Zhang (2003) concluded through empirical research that although listed companies in China have significant advantages in financing efficiency, the allocation efficiency of financing funds is not ideal due to problems in corporate governance structure. As a crucial means for enterprise owners to govern the company, internal control system can effectively reduce enterprise management risks, improve the reliability of financial information and protect enterprise stakeholders. Therefore, the internal control information disclosed to the outside world is an important source of information for creditors, potential investors and other information users to know about corporate governance and make correct decisions on credit and investment (Cai, 2005). In July 2009, the "Basic Standard for Enterprise Internal Control" jointly formulated by the Ministry of Finance, the China Securities Regulatory Commission, the National Audit Office and other departments was officially implemented within the scope of listed companies in China. The release of the "Basic Standard for Enterprise Internal Control" has built a standardized framework for the problems of uneven internal control systems of domestic enterprises, which has effectively promoted the standardized development of enterprise internal control systems. In this context, studying the impact of internal control information disclosure on the debt financing efficiency of listed companies has key theoretical significance and practical value in promoting the development of corporate governance structure, improving corporate financing efficiency and further protecting the interests of creditors.

Based on the above-mentioned problems as our starting point, this study selects the panel data of the A-share listed companies on the main board of Shanghai and Shenzhen Stock Exchange from 2010 to 2020 as the research object, and uses methods such as the least squares method and the instrumental variable analysis to examine the effect of internal control information disclosure on the

debt financing efficiency of listed companies. The research results of this paper indicate that the quality improvement of company's internal control information disclosure can significantly boost its debt financing efficiency. Further research shows that compared with non-state-controlled companies, the internal control information disclosure of state-controlled companies has a more significant influence on their debt financing efficiency. Meanwhile, as a moderator variable, education background of company management can also greatly enhance the effect between internal control information disclosure and debt financing efficiency.

The marginal contribution of this paper mainly lies in the following points: (1) Debt financing efficiency is a widely concerned issue in both industry and academia, but there are few studies on the relationship between internal control information disclosure and debt financing efficiency. Our study provides experience for this area by empirically testing the impact of internal control information disclosure on the debt financing efficiency of listed companies. (2) This paper uses the method of variable substitution and the instrumental variable analysis to perform robustness tests, trying to overcome the endogeneity problem of the internal control information disclosure variables. (3) Our research applies the educational background of management as a moderator variable to study its moderating effect on the relationship between internal control information disclosure and debt financing efficiency. (4) From the perspective of corporate property rights, our paper discusses the heterogeneity of the impact of internal control information disclosure on the debt financing efficiency.

The rest of the paper proceeds as follows. Section 2 is the theoretical analysis and research hypothesis; Section 3 reports our study design of data, variables and models; Section 4 examines the impact of internal control information disclosure on the debt financing efficiency of listed companies and introduces the empirical results and analysis; Section 5 concludes and gives suggestions based on empirical results.

2. Theoretical Analysis and Research Hypothesis

2.1 Internal control information disclosure and debt financing efficiency

It is not difficult to see from the "Basic Standard of Enterprise Internal Control" that since its establishment, the internal control system has been committed to improving the business performance and competitiveness of enterprises, and its content covers all aspects of enterprise operation and management, including the investment and financing behavior. Enterprise's financing efficiency is affected by the cost of financing and the income of capital output. On the one hand, the disclosure of internal control information can effectively reduce the financing cost of enterprises. Shen et al. (2013) and Yang et al. (2018) found that the higher the quality of the internal control disclosure of listed companies, the lower the company's cost of debt capital, and the two have an inverse relationship. Ogneva and Raghunandan (2007) also found through empirical research that there is a correlation between the disclosure of internal control defects and the company's cost of capital. Meanwhile, high-quality internal control information disclosure can also convey a signal of good corporate governance and reliable solvency to banks and other creditors, and reduce the risk premium cost caused by creditors' misjudgment of corporate risks due to information asymmetry. Ashbaugh-Skaife et al. (2008) also believed that good internal control can improve the quality of corporate accounting information, thereby reducing corporate financing costs. On the other hand, high-quality internal control information disclosure is also conducive to improving the profitability of financing funds. Cheng and Wang (2005) provide evidence suggesting that the internal control system is mainly a governance mechanism for the business activities of enterprises. The internal and external supervision, incentive mechanism and efficient communication mechanism formed by high-quality internal control and related information disclosure can greatly promote the smooth progress of enterprise operation and investment and financing decisions, thereby increasing the allocation and utilization efficiency of financing funds. Based on the above analysis, this paper proposes the following hypothesis 1:

H1: High-quality internal control information disclosure can significantly improve the debt financing efficiency of listed companies.

2.2 The moderating effect of management's educational background

To a certain extent, the educational background of the management can reflect the professional technical background and behavioral ability level of the company's managers. And the educational background is also an important condition for the corporate governance layer to consider when hiring managers. The level of education has a vital influence on management's judgment ability and rational expectations (Wiersema and Bantel, 1992). Enterprise internal control and its information disclosure is a systematic work. Due to the fact that managers with higher education levels often have higher levels of internal control information identification and processing capabilities, they can make more scientific and reasonable decisions to guarantee the timeliness, authenticity and accuracy of internal control information disclosure, which in turn affects the relationship between internal control information disclosure and the debt financing efficiency of companies. Based on the above analysis, our study proposes Hypothesis 2:

H2: The educational background of management has a moderating effect on the influence of internal control information disclosure on debt financing efficiency of listed companies.

2.3 Heterogeneity analysis from the perspective of enterprise property rights

Under the special system background of economic transformation, state-owned enterprises and non-state-owned enterprises in China have great differences in the construction of internal control systems. State-owned enterprises took the lead in implementing the basic norms of the internal control system jointly launched by the Ministry of Finance and other five ministries and commissions, and quickly formed a relatively complete and effective system. However, the internal control system construction of non-state-owned enterprises lacks high-intensity government intervention, resulting in lower quality of internal control and information disclosure than state-owned enterprises (Zhang, 2017). Under the government's high-pressure supervision and strict requirements, state-owned enterprises confront with different economic tasks and stricter supervision than non-state-owned enterprises, so state-owned enterprises may have better quality of internal control and information disclosure. Due to different nature of property rights, the quality of internal control and its information disclosure will also have different emphasis on the efficiency of corporate debt financing. Based on the above analysis, our paper proposes Hypothesis 3:

H3: Compared with non-state-controlled listed companies, state-controlled listed companies' internal control information disclosure has a more significant effect on their debt financing efficiency.

3. Study Design

3.1 Data source and sample selection

The data of listed companies used in this paper mainly come from the CSMAR database. Our study mainly uses Excel2016 and StataMP15.0 statistical analysis software to process the data. Excel is basically responsible for data sorting and screening, while Stata is mainly responsible for data processing analysis and regression testing.

The essence of debt financing efficiency lies in the dynamic changes of the company's debt capital cost and financing income over time. Therefore, this paper collects the panel data of A-share listed companies on the main board of Shanghai and Shenzhen Stock Exchanges from 2010 to 2020 as the initial study sample. And in order to ensure the integrity and availability of the sample, the initial research sample is processed as follows: (1) Exclude listed companies in the financial and real estate industries; (2) Exclude listed companies with abnormal financial data and incomplete financial information disclosure; (3) Exclude listed companies in ST, SST, *ST, and S*ST; (4) Winsorize the principal continuous variables at 1% level. Finally, unbalanced panel data is obtained, with a total of 7707 observations.

3.2 Variable design

Explained Variable: DFE (Debt Financing Efficiency). Drawing on the research of Wu (2012), Cao and Liu (2013), we use the ratio of the company's expected return on financing to the cost of debt capital to measure the debt financing efficiency. Moreover, this paper adopts the return on total assets to represent company's expected return on financing. Since it is arduous to accurately obtain the various types of debt interest data such as bank loans, bonds and non-bank institution loans, we also learn from the measurement method of Zou and Adams (2008) on debt financing costs, using the ratio of interest expenses to the total liabilities represents the cost of debt financing.

Explanatory variable: ICIDID (Internal Control Information Disclosure Index). The principal explanatory variable of this paper reflects the actual quality of internal control information disclosure of listed companies, which is generated by using the internal control information disclosure data in the CSMAR database. Starting from the characteristics of internal control information disclosure in the existing literature, we selected the following five questions to score the quality of company's internal control information disclosure: "Is the internal control evaluation report disclosed?", "Is the conclusion of the internal control evaluation report issued?", "Is the internal control audit report disclosed?", "Is the disclosed internal control system effective?" and "Is the identification and rectification of defects in the internal control system disclosed?". If the answer to the question is "yes", mark "1", otherwise it is "0". Then, the scores of the five questions are aggregated to form the internal control information disclosure index of listed companies, with a full score of 5. The higher the total score, the better the quality of the company's internal control information disclosure.

Control variables: The control variables that we use as determinants of debt financing efficiency are all based on existing literature. Specifically, we use: (1) Size (Company size), which is represented by the natural logarithm of the company's total assets at the beginning of the year. Generally speaking, the larger the company is, the more information it needs to disclose to the outside world, and the public will pay more attention to it. Therefore, the public tends to expect higher quality of internal control information disclosure to reduce the potential investment risks from information asymmetry. (2) ROE (Return on equity). We use ROE to measure the profitability of listed companies. Lang and Lundholm (1993) believed that there is a correlation between the quality of corporate information disclosure and the company's profitability, and higher quality of information disclosure will bring a higher level of profitability. (3) CR (Current ratio). The current ratio is applied to represent the solvency of a listed company in this paper, which reflects the ability of the company's current assets to be realized to repay the debt before the short-term debt matures. And the current ratio at a reasonable level means that the company has enough realizable assets to repay its debts, which reduces the risks and uncertainties faced by creditors and promotes the efficiency of company's debt financing. (4) TAT (Total assets turnover). We use the total assets turnover ratio to reflect the operational efficiency of a company's assets. The higher the ratio, the better the operating efficiency of the assets, which will bring more benefits to the company. (5) GBGR (Growth rate of business revenue) to proxy for company's future development trends. The sustainable development of the company is inseparable from the steady growth of business revenue, so this ratio is used to evaluate the growth capacity of the company after financing. (6) REP, defined as the reputation level of the accounting firm entrusted by the company. (7) TRN, defined as the transparency of listed companies disclosed by Shenzhen and Shanghai Stock Exchange.

All variable definitions involved in this paper are summarized in Table 1:

Table 1. Variable Definition

Properties	Name	Symbol	Definition
Explained Variable	Debt financing efficiency	DFE	ROA divided by the ratio of interest expense to gross liability
Explanatory Variable	Internal control information disclosure index	ICIDID	Score on the quality of internal control information disclosure
	Company size	Size	Natural logarithm of total assets at the beginning of the year
	Return on equity	ROE	Net profit divided by shareholders' equity
	Current ratio	CR	Current assets divided by current liabilities
	Total assets turnover	TAT	Operating income divided by total assets
Control Variable	Growth rate of business revenue	GRBE	Change in operating income divided by last year's operating income
	Reputation	REP	Is the accounting firm entrusted by the company DTT, E&Y, PWC or KPMG? (Yes = 1, No = 0)
	Transparency	TRN	Transparency of listed companies disclosed by Shenzhen and Shanghai Stock Exchange (fail=1, pass=2, good=3, excellent=4)

3.3 Model Establishment

Considering that the debt financing efficiency of listed companies is a continuous variable, this paper primarily uses the ordinary least squares (OLS) method to study the impact of internal control information disclosure on the debt financing efficiency of listed companies. Referring to the research of Wu (2012), the econometric regression model is constructed as follows:

$$DFE_{i,t} = \alpha_0 + \beta_1 ICIDID_{i,t} + \beta_2 Controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

In the equation, the subscript *i* represents the *i*th listed company, the subscript *t* represents the year, $DFE_{i,t}$ represents the efficiency of debt financing, $ICIDID_{i,t}$ represents the internal control information disclosure index and $Controls_{i,t}$ represents the control variables. Summary statistics for all variables are shown in Table 2:

Table 2. Summary Statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
DFE	15, 373	6.67599	16.54802	0.00065	108.59620
ICIDID	13, 983	3.44955	0.55766	2	5
Size	15, 196	22.30018	1.38583	14.94164	28.63649
ROE	15, 307	0.09378	0.26911	-18.71884	21.34766
CR	18, 706	1.75657	1.692839	0.01453	68.96554
TAT	15, 365	0.75135	0.59457	0.00180	9.81275
GRBE	17, 664	0.19362	0.42766	-0.56876	2.88579
REP	15, 198	0.07093	0.25672	0	1
TRN	7, 792	3.03568	0.59239	1	4

4. Empirical Results and Analysis

4.1 Benchmark regression test

Table 3 reports the regression results of the OLS model on the impact of internal control information disclosure on the efficiency of debt financing of listed companies. From the regression results, it can be seen that the coefficient of the ICIDID is significantly positive at the 5% level, that is, the internal control information disclosure has significantly improved the debt financing efficiency of listed companies. Therefore, research hypothesis 1 is validated.

Table 3. Benchmark regression test

Variable	DFE
ICIDID	0.608** (2.06)
Size	-0.957*** (-5.51)
ROE	14.423** (2.47)
CR	0.573*** (3.55)
TAT	0.386 (1.58)
GRBR	1.781*** (3.03)
REP	3.787*** (3.30)
TRN	2.153*** (6.00)
Constant	14.969*** (3.77)
R-squared	0.038
Observations	7707

*** p<0.01, ** p<0.05, * p<0.1, t-statistics are presented in parentheses

As for control variables, Size is negatively correlated with debt financing efficiency at the 1% significance level. Although large-scale companies can have sufficient asset protection in the stage of raising debt funds, the efficiency of debt financing also depends on the allocation efficiency and utilization of the raised funds. The negative correlation between company size and debt financing efficiency shows that companies with too large scale are more likely to have idle financing funds and waste of resources, which will lead to increased financing costs and reduced financing efficiency. The transparency of listed companies and the reputation of the accounting firms entrusted by them are significantly positive at the 1% level, indicating that the transparent disclosure of information and the high-quality reputation of related accounting firms will promote the improvement of their debt financing efficiency. Finally, the ROE, CR and GBGR are all significantly positive at the level of 1%, showing that companies with more outstanding profitability, solvency and growth capacity can achieve higher debt financing efficiency.

4.2 Endogeneity

There are two reasons for the existence of endogeneity problems. The first reason is reverse causality. Higher quality of internal control information disclosure may promote the efficiency of debt financing of listed companies, but the company may also actively strengthen the information disclosure of internal control due to the improvement of debt financing efficiency. The second reason is the problem of missing variables. The omission of variables may have a decisive impact on the quality of internal control information disclosure, and may also be related to the efficiency of debt financing. In order to solve the endogeneity problem, this paper uses the lag one period of the internal control information disclosure index as an instrumental variable. Meanwhile, we use the two-stage least squares (2SLS) to test the validity of instrumental variables. And it can be seen from the results in Table 4 that after the processing of instrumental variables, the ICIDIDhat is still significantly positive at the 10% level, which proves that the model passes the endogeneity test.

Table 4. Endogeneity test

Variable	DFE
ICIDIDhat	4.66* (1.79)
Size	-1.044*** (-5.30)
ROE	13.749** (2.41)
CR	0.472*** (3.14)
TAT	0.301 (1.27)
GRBR	1.599*** (2.92)
REP	4.175*** (3.55)
TRN	1.665*** (3.52)
Constant	0.33 (0.04)
R-squared	0.036
Observations	7441

*** p<0.01, ** p<0.05, * p<0.1, t-statistics are presented in parentheses

4.3 Moderator variable

Table 5. Moderating effect

Variable	DFE
ICIDIDEL	1.032* (1.71)
ICIDID	-0.064 (-0.15)
EL	-3.983 (-1.47)
Size	-1.011*** (-5.40)
ROE	18.119*** (3.41)
CR	0.516*** (3.43)
TAT	0.289 (1.05)
GRBR	1.759*** (2.72)
REP	2.896*** (2.58)
TRN	2.095*** (5.42)
Constant	18.999*** (4.25)
R-squared	0.042
Observations	7241

*** p<0.01, ** p<0.05, * p<0.1, t-statistics are presented in parentheses

In order to study under what circumstances the relationship between internal control information disclosure and debt financing efficiency will be enhanced or weakened, this paper introduces the educational background (EL) of the management of listed companies as the moderator variable of the

model. Table 5 indicates that the interaction term between the moderator variable and the ICIDID is significantly positive at the 10% level, demonstrating that the educational background of the management will enhance the effect of internal control information disclosure on the debt financing efficiency of listed companies. Therefore, research hypothesis 2 was validated.

4.4 Robustness check

To ensure the reliability of the research conclusions, our paper conducts the following robustness test. The ratio of net profit and interest expenses is used to replace the measurement method of debt financing efficiency in the benchmark regression test. And the regression results are shown in Table 6. Our study found that after changing the measurement method of debt financing efficiency, the ICIDID is still significantly positive at the level of 1%, that is, the conclusion that internal control information disclosure can greatly promote the debt financing efficiency of listed companies is robust, and it does not depend on the selection of specific research methods.

Table 6. Robustness check

Variable	DFE
ICIDID	14.291*** (3.66)
Size	-11.414*** (-4.95)
ROE	85.311*** (2.98)
CR	6.434*** (3.22)
TAT	4.883* (1.88)
GRBR	-1.241 (-0.38)
REP	25.309 (1.56)
TRN	8.317** (2.39)
Constant	162.33*** (4.08)
R-squared	0.015
Observations	7568

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, t-statistics are presented in parentheses

5. Heterogeneity Analysis

In this part of the study, the samples are grouped according to the nature of property rights for regression analysis. Based on the ultimate controllers of companies, listed companies are divided into state-controlled companies and non-state-controlled companies.

Table 7 reports the regression results after grouping. The regression results for state-owned companies are shown in column (1), and the results for non-state-owned companies are organized in column (2). Among state-controlled listed companies, internal control information disclosure and debt financing efficiency are significantly correlated at the 1% level, while for non-state-controlled companies, although the sign of the regression coefficient of ICIDID is consistent with expectations, it fails the significance test. It means that for state-controlled listed companies, the higher the quality of internal control information disclosure, the higher the efficiency of debt financing. As the direct operating entity and investment entity of state-owned assets, state-owned companies will receive more attention and supervision from the government on the quality of their internal control information disclosure, which will also promote the company's internal control information disclosure.

Hence it should be noted that in state-owned companies, the relationship between internal control information disclosure and debt financing efficiency will be more significant. Therefore, research hypothesis 3 is verified.

Table 7. Heterogeneity Analysis

Variable	DFE	
	(1)	(2)
ICIDID	1.554** (1.98)	0.432 (1.37)
Size	-1.177*** (-3.02)	-0.775*** (-4.13)
ROE	18.686** (2.41)	14.237** (2.23)
CR	0.1 (0.60)	0.751*** (4.27)
TAT	0.107 (0.27)	0.409 (1.49)
GRBR	0.606 (0.60)	2.065*** (3.07)
REP	7.172** (2.40)	3.18** (2.51)
TRN	2.181* (1.70)	2.19*** (5.91)
Constant	15.939 (1.62)	11.31*** (2.64)
R-squared	0.050	0.038
Observations	958	6657

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$, t-statistics are presented in parentheses

6. Conclusion and Suggestion

This paper uses the data of listed companies in the CSMAR database from 2010 to 2020, and utilizes the least squares method, instrumental variable method and other methods to conduct an empirical study on the impact of internal control information disclosure on the debt financing efficiency of listed companies. Then, our study comes to the following conclusions. (1) The improvement of the quality of internal control information disclosure can greatly boost the efficiency of debt financing. After the robustness test and the use of instrumental variable to solve the endogeneity problem, the regression results are still significant, which confirms that the improvement of the quality of internal control information disclosure of listed companies is indeed conducive to increasing the efficiency of debt financing. (2) From the perspective of the company's property rights, the improvement of the quality of internal control information disclosure can remarkably promote the debt financing efficiency of state-controlled listed companies, while it has little effect on non-state-controlled companies. (3) A good educational background of the management can significantly enhance the promotion relationship of internal control information disclosure to the efficiency of debt financing.

Based on the above conclusions, we put forward the following suggestions: First, listed companies should pay attention to their own internal control information disclosure, and strive to improve the quality of internal control information disclosure. At present, the majority of listed companies are still passive in their internal control information disclosure, and most companies disclose their own internal control information only to meet the requirements of relevant policies and regulations, ignoring the positive role of internal control information disclosure in the development and management of contemporary enterprises. The empirical research of this paper finds that company's high-quality internal control information disclosure can effectively advance the debt financing efficiency. Thus, enterprises should focus on perfecting the internal control system and improving

the quality of internal control information disclosure, thereby elevating the efficiency of debt financing and realizing the optimization of capital cost and financing income. Second, related government departments should perfect the rules and regulations of the internal control information disclosure for enterprises, and strengthen the supervision of it. By clearly stipulating the scope, content and form of internal control information disclosure, government can further achieve the standardization of it. Then, governments are supposed to establish a reward and punishment system for corporate internal control by rewarding companies with standardized disclosure and good credit and intensifying the punishment on companies that commit financial fraud and violate regulations in information disclosure. It is obvious that strengthening the supervision of corporate internal control information disclosure and improving relevant systems can not only protect the interests of creditors, but also help to further ensure economic security and maintain the stability of capital market.

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