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Short-selling Mechanism Can Improve the Readability of Corporate Financial Statements

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ABSTRACT
In this paper, whether all listed companies are included in the short sellable list during the 12-year period from 2010, when the short selling mechanism was introduced in China, to 2022 is taken as the independent variable, the readability of corporate financial statements is taken as the dependent variable, and the size of the enterprise, etc. is taken as the control variable. Using the method of least squares regression, Stata is used to study whether the short selling mechanism can effectively improve the readability of corporate financial statements and further study the mechanism of its impact. After the study, it is found that whether it is on the short-selling list has a greater impact on the readability of the financial statements of the enterprise, i. e., the introduction of the short-selling mechanism can effectively enhance the readability of the financial statements of the enterprise and improve the quality of the enterprise's information disclosure.
KEYWORDS
Short selling; Short selling mechanism; Readability

1 Introductory

In recent years, the China Securities Regulatory Commission (CSRC) has earnestly implemented the requirements and deployments of the CPC Central Committee and the State Council on the reform and development of the capital market, done a good job of supervision and law enforcement according to the law, maintained a high-pressure law enforcement situation against listed companies for disclosure of information violations, and continued to strengthen the responsibilities of the directors, supervisors and senior management of listed companies, as well as the major shareholders and de facto controllers, and used the law in full to significantly increase the cost of violating the law and breaching the law, and forced listed companies to standardise governance During the period from 2016 to 2018, a total of 170 cases of information disclosure violations by listed companies were punished, with fines totalling RMB 200,161,000 yuan, market bans totalling 80 persons, and the targets of accountability involving directors, supervisors, major shareholders, and de facto controllers totalling more than 1,202 persons, with a total of 113 liable persons being punished by imposing maximum fines In addition, 19 cases of suspected crimes were referred to public security authorities, and the Company actively supported the People's Courts in hearing civil compensation cases for misrepresentation, thus creating a strong deterrent to illegal disclosure of information by listed companies. There are many ways to study the quality of information disclosure of listed companies, one of which is to study the readability of financial statements of listed companies.

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Referring to domestic and international literature, it is found that the short-selling system can improve the readability of corporate financial disclosure to a certain extent in stock markets with perfect systems such as the UK and the US. Therefore, this paper takes whether enterprises are included in the list of pilot enterprises of the shorting system as the independent variables during the 12-year period from 2010, when the shorting system was introduced into China's A-share market, to 2022, to explain whether the readability of enterprises' financial statements has been significantly improved and whether the disclosure of enterprises' information has been improved.

2 Literature review

In recent years, scholars at home and abroad have studied the readability of financial statements more and more deeply, for example, Feng Li[1] has studied current earnings and earnings persistence; Brian J. Bushee, Ian D. Gow and Daniel J. Taylor[2] believe that future research on linguistic complexity can construct a more powerful test by studying these two potential components of linguistic complexity separately; Mine Ertugrul et al.[3] scholars argue that hoarding of corporate management information affects the readability of corporate financial information; Peter M. Clarkson et al.[4] managers with higher risk incentives issue less readable disclosures.

However, most of the studies on readability in the literature use the readability of corporate financial statements as the independent variable and study its impact on other factors, and not many articles study what factors affect the readability of corporate financial statements. Most of the articles on the relationship between readability and short-selling mechanism use foreign markets, and there are fewer studies on the Chinese market. And the Chinese market has no perfect short-selling mechanism so far, so it is crucial to study the relationship between the two and think about whether to introduce a short-selling mechanism for China. Based on the above factors, this paper investigates whether a short-selling mechanism can enhance the readability of corporate financial statements and examines the mechanism of its impact.

3 Research hypotheses

Domestic and foreign scholars have likewise studied whether the introduction of a short-selling mechanism affects the readability of financial statements. Among them, Jonathan M. Karpoff and Xiaoxia Lou[5] argued that short sellers are more likely to detect financial misconduct of enterprises; Massimo Massa et al.[6] argued that short selling can be used as an external governance mechanism to restrain managers; Vivian W. Fang et al.[7] scholars argued that short selling or its prospect can inhibit surplus management, help to detect fraudulent behaviours and improve price efficiency. From the above studies, this paper proposes the following hypotheses:

H1: The short-selling mechanism can enhance the readability of corporate financial statements.

According to Xi Zhao et al.[8], managerial power and the degree of disclosure of internal information are closely related, and the more power managers have to manipulate the disclosure of information, the lower the quality of the disclosed information is likely to be. Therefore, this paper investigates whether corporate governance by corporate managers has an impact on the short-selling mechanism and the readability of financial statements from the aspect of corporate governance. As a result, the paper proposes the following hypothesis of moderating effect:

H2: The better the corporate governance, the weaker the relationship between the shorting mechanism and the readability of firms' financial statements.

At the same time, the most important thing for a business is whether it is profitable or not, which is one of the important factors for outside investors to decide whether to invest or not. While there is a tendency for enterprises to hide bad information, when there is a net income of less than 0, it is more likely that there is a possibility of ambiguity in the financial statements, which reduces the readability of the enterprise's financial statements. After a firm is included in the financing list, outside short sellers will pay more attention to the firm's profitability, causing the firm not to dare to hide the news that the net profit is 0. Therefore, we believe that whether the firms survive losses or not affects the relationship between the short-selling mechanism and the readability of the firms' financial statements. From the above study, the following hypothesis of moderating effect can be proposed:

H3: Loss-making firms weaken the relationship between the shorting mechanism and the readability of firms' financial statements more than non-loss-making firms.

4 Research design

4.1 Research data

Firms' financial information is obtained from the Wingo database, while the rest of the data on corporate governance, solvency, and external governance environment are obtained from the CSAMR database, which mainly contains information on firms' governance, such as the distribution of firms' management, financing and securities financing, and details of listed companies' trades, and other basic information on the short-selling mechanism. The data in the CSAMR database contain information on corporate governance, such as the distribution of corporate management, financing and securities financing, trading details of listed companies, and other basic information about the short-selling mechanism.

4.2 Research Modelling

To test the relationship between the shorting mechanism and the readability of corporate financial statements, this paper constructs the following least squares estimation model (1), drawing on Massimo Massa et al.'s[6] study of corporate financial statements and shorting, respectively:

$$Readability_{it} = \alpha_0 + \beta_1 Treat_{it} + \sum_{j=1}^{n} \theta_j Control_{it} + \mu_{i,Year} + \varepsilon_{it} \tag{1}$$

where the dependent variable is an indicator of the readability of firms' financial statements and the independent variable is the short-selling mechanism. Control is a set of control variables that may affect the readability of firms' financial reports. In addition, this paper controls for year-level fixed effects ($\mu_{i,year}$) and adjusts for the clustering of standard errors at the firm level.

4.3 Interpretation of variables

4.3.1 Explained variables

The dependent variable Readability in this paper is derived from the data on the readability of firms' financial statements for each year in the Wingo database, and the corresponding dependent variables are constructed.

4.3.2 Independent variables

The independent variable used in this paper is the short-selling mechanism. This paper refers to the study by Chuntao Li[9] and defines the independent variable Treat, which is 1 if the firm is included in the financing list in the current year and 0 if the firm is not included in the financing list in the current year.

Table 1 shows the explanations and definitions of all variables:

Table 1 Variable definitions

Variable type	Variable name	Notation	Variable definition
dependent variable	Report Readability	Readability	See instructions for constructing readability indicators
independent variable	Financing List	Treat	Listed companies are included in the financing list is Treat=1; listed companies are not included in the financing list Treat=0
moderator variable	capital expenditure	Occupy	Capital Misappropriation by Substantial Shareholders
	Is there a loss	Loss	Whether the enterprise is losing money in that year, the net profit of the enterprise in that year is less than 0 take 1, otherwise, it will take 0
control variable	Nature of ownership	SOE	Listed companies belonging to SOEs are SOE=0 and listed companies belonging to non-SOEs are SOE=1.
	Enterprise size	Size	Natural logarithm of total assets at the end of the period
	growth	TobinQ	The market capitalisation of the company / Total assets
	Book-to-market ratio	BM	Shareholders' equity/company market capitalisation
	current ratio	Liquid	Current assets/current replication
	Natural logarithm of total management remuneration	TMTPay2	Logarithmic sum of management remuneration
	Number of employees	Employee	Natural logarithm of the number of employees
	sector	Industry	Industry dummy variables
	vintages	Year	Year dummy variable

4.4 Descriptive statistics

Table 2 analyses the variables with descriptive statistics. From it, we can find that the mean of the dependent variables is less than 0, which means that most of the firms are not yet included in the list of securities financing, that is, most of the firms are not available for shorting at this time.

Table 2 Description of basic statistics

Variable	N	mean	p50	sd	min	max
Readability	40595,000	-19,266	-19,159	2,623	-106,285	-9,827
Treat	40595,000	0,169	0,000	0,375	0,000	1,000
SOE	39506,000	0,352	0,000	0,478	0,000	1,000
Size	40594,000	22,231	21,981	1,510	13,076	31,310
TobinQ	39891,000	2,216	1,591	10,603	0,609	1752,705
BM	39891,000	0,626	0,628	0,253	0,001	1,643
Liquid	39832,000	2,779	1,705	4,201	-5,132	204,742
Loss	40595,000	0,118	0,000	0,322	0,000	1,000
TMTPay2	40530,000	15,328	15,307	0,809	5,911	18,930
Occupy	40007,000	0,017	0,007	0,036	0,000	0,993
Employee	40576,000	7,605	7,528	1,346	0,000	13,253
Industry	40595,000	38,292	36,000	17,525	1,000	84,000

5 Empirical analyses

Table 3 Regression analyses of shorting mechanisms that can enhance the readability of corporate financial statements

	Readability			
		Corporate governance		Corporate losses
Treat	0.149***(3.75)	0.1494***(3.7459)	0.1498***(3.7574)	0.1494***(3.7459)
SOE	0.0706(1.14)	0.0706(1.1380)	0.0681(1.0979)	0.0706(1.1380)
Size	-0.689***(-24.67)	-0.6895***(-24.6741)	-0.6892***(-24.6650)	-0.6895***(-24.6741)
TobinQ	-0.00243**(-2.64)	-0.0024***(-2.6400)	-0.0024***(-2.6371)	-0.0024***(-2.6400)
BM	0.543***(7.98)	0.5428***(7.9832)	0.5386***(7.9187)	0.5428***(7.9832)
Liquid	0.0184***(6.33)	0.0184***(6.3311)	0.0183***(6.3049)	0.0184***(6.3311)
Loss	-0.173***(-5.64)	-0.1730***(-5.6402)	-0.1753***(-5.7113)	-0.1730***(-5.6402)
TMTPay2	-0.0997***(-3.96)	-0.0997***(-3.9600)	-0.0998***(-3.9653)	-0.0997***(-3.9600)
Occupy	-2.332***(-7.40)	-2.3325***(-7.4039)	-2.1979***(-6.8368)	-2.3325***(-7.4039)
Employee	-0.0552*(-2.32)	-0.0552**(-2.3204)	-0.0556**(-2.3380)	-0.0552**(-2.3204)
Industry	-0.00901***(-5.93)	-0.0090***(-5.9292)	-0.0090***(-5.8900)	-0.0090***(-5.9292)
2010	0(.)	0.0000(.)	0.0000(.)	0.0000(.)
2011	-0.165**(-3.07)	-0.1647***(-3.0738)	-0.1641***(-3.0629)	-0.1647***(-3.0738)
2012	1.183***(22.15)	1.1825***(22.1508)	1.1830***(22.1612)	1.1825***(22.1508)
2013	1.049***(19.68)	1.0490***(19.6776)	1.0492***(19.6823)	1.0490***(19.6776)
2014	1.153***(21.58)	1.1530***(21.5827)	1.1527***(21.5782)	1.1530***(21.5827)
2015	1.811***(33.46)	1.8109***(33.4550)	1.8102***(33.4435)	1.8109***(33.4550)
2016	2.321***(43.14)	2.3207***(43.1365)	2.3200***(43.1246)	2.3207***(43.1365)
2017	1.523***(28.31)	1.5225***(28.3124)	1.5218***(28.3004)	1.5225***(28.3124)
2018	0.395***(7.12)	0.3951***(7.1209)	0.3957***(7.1323)	0.3951***(7.1209)
2019	0.342***(6.10)	0.3416***(6.1039)	0.3417***(6.1062)	0.3416***(6.1039)
2020	-0.205***(-3.62)	-0.2046***(-3.6191)	-0.2041***(-3.6099)	-0.2046***(-3.6191)
202	-0.890***(-15.51)	-0.8902***(-15.5134)	-0.8897***(-15.5048)	-0.8902***(-15.5134)
2022	-0.312***(-5.26)	-0.3117***(-5.2630)	-0.3097***(-5.2298)	-0.3117***(-5.2630)
M			1.9987**(2.0979)	
_cons	-2.498***(-4.75)	-2.4976***(-4.7476)	-2.4991***(-4.7508)	-2.4976***(-4.7476)
N	38179	38179	38179	38179
R^2		0.3231	0.3232	0.3231

Note:t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Based on the above research and analysis, this paper conducts a series of sub-sample regressions from the perspective of the financing constraint index.

To verify that the shorting mechanism can enhance the readability of firms' financial statements, Table 2 is regressed according to Model 1, and the results after the regression are presented in the table below. Column 1 of the table introduces the dummy variable Treat, which indicates through 0 and 1 whether the firm is included in the shortable list for that year. Using the double fixed effects regression, we find that there is a significant positive correlation between the availability of shorting and the readability of the firm's financial statements (β=0.149), and the results are significant at the 1% level, which suggests that firms that are included in the shortlist have significantly more readable financial statements than firms that are not included in the shortlist.

Table 3 below examines whether corporate governance affects the relationship between the short-selling mechanism and the readability of firms' financial statements. We chose the shareholders' funds ratio to capture corporate governance; if the shareholders' funds ratio is lower, then it indicates that the firm has better governance. We regressed the moderating variables using interaction term regression. The results are shown in the table, according to the table, it can be concluded that the coefficient of the interaction term between the shareholders' capital ratio and the dependent variables is significantly positive and significant at the 10 per cent level. It can be concluded that the smaller the shareholders' share of the firm, the smaller the effect on the relationship between the short-selling mechanism and the readability of the firm's financial statements. In other words, the better the corporate governance, the smaller its effect on the dependent and interpreted variables.

At the same time, this paper has also produced the results in the table below after conducting an interaction term regression on the effect of whether a firm lost money in the year on the relationship between the independent variables and the explained variables. According to the results of the table, it can be seen that the interaction term between whether a firm is losing money and whether it is on the financing list shows a significant positive correlation. It indicates that when the company is losing money during the year, the greater the impact on the relationship between whether the company is on the financing list and the readability of the financial statements.

6 Robustness test

Table 4 Regression analyses of shorting mechanisms that can enhance the readability of corporate financial statements

	Readability	
AR/FK	3.222^{***}(312.58)	2.417^{***}(148.22)
SOE	0.0449(1.43)	0.240^{***}(4.98)
Size	-0.0849^{***}(-6.01)	-0.343^{***}(-15.84)
TobinQ	0.000237(0.51)	0.000161(0.23)
BM	-0.0516(-1.51)	0.102(1.94)
Liquid	0.000744(0.51)	0.00466^{*}(2.06)
Loss	-0.0809^{***}(-5.21)	-0.112^{***}(-4.70)
TMTPay2	-0.0523^{***}(-4.11)	-0.100^{***}(-5.12)
Occupy	-0.657^{***}(-4.12)	-1.190^{***}(-4.85)
Employee	0.00669(0.56)	-0.0199(-1.08)
Industry	-0.00622^{***}(-8.09)	-0.00842^{***}(-7.12)
2010.year	0(.)	0(.)
2011.year	0.107^{***}(3.95)	0.120^{**}(2.87)
2012.year	-0.475^{***}(-17.26)	0.0143(0.34)
2013.year	-0.475^{***}(-17.36)	-0.0457(-1.09)
2014.year	-1.016^{***}(-36.53)	-0.580^{***}(-13.48)
2015.year	-1.430^{***}(-48.86)	-0.847^{***}(-18.51)
2016.year	-1.768^{***}(-58.59)	-1.024^{***}(-21.56)
2017.year	-2.454^{***}(-81.81)	-1.937^{***}(-40.48)
2018.year	-2.395^{***}(-81.47)	-2.326^{***}(-49.67)
2019.year	-3.330^{***}(-109.39)	-3.244^{***}(-65.50)
2020.year	-4.020^{***}(-129.98)	-4.167^{***}(-81.30)
2021.year	-4.606^{***}(-147.49)	-4.860^{***}(-93.67)
2022.year	-3.815^{***}(-120.64)	-3.210^{***}(-64.81)
_cons	-33.00^{***}(-118.09)	32.01^{***}(68.59)
N	38179	38179

Note:t statistics in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In this paper, the model is tested for substitution of key variables using the alternative dependent variable Readability calculated in two different ways as shown below.

The AR indicator uses the calculation of average word length and average sentence length to measure readability; the larger the value of the AR indicator, the greater the comprehension required for reading and the worse the readability. In order to ensure that the size of the AR indicator is consistent in direction with the level of readability, the original formula is multiplied by

(-1), and the final formula adopted is as follows:

$$AR_{it} = [\,4.17 \times \left(\frac{num_{it}}{wd_{it}}\right) + .39 \times (\frac{wd_{it}}{sent_{it}}) - 21.43\,] \times (-1) \tag{3}$$

Based on the above formula, we arrive at the following results. According to Table 4, it can be concluded that there is a positive relationship between whether a firm is included in the financing list and the readability of the firm's financial statements, and it is significant at the 1% level. It is the same as the result derived from Hypothesis 1.

The FK metrics refer to the Flesch-Kincaid formula. The FK metrics represent the reading ability required of the reader. The larger the value of the FK metrics, the higher the required reading ability and the lower the level of readability. In order to ensure that the size of the FK indicator is highly consistent in direction with the readability level, the original formula was multiplied by (-1), and the final formula adopted is as follows:

$$FK\_it = [\,11.8 \times ((num\_it)/(wd\_it)) + 0.39 \times ((wd\_it)/(sent\_it)) - 15.9\,] \times (-1) \tag{4}$$

In the above two equations,wd_{it} is the number of words in the annual report of a listed company in year i year t,num_{it} is the number of words in the annual report of a listed company in year i year t, $sent_{it}$ is the number of sentences in the annual report of a listed company in year i year t.

The results obtained from the regression based on equation (4) are shown in Table 5. As the results show, the relationship between the short-selling mechanism and the financial statements of firms is positively correlated and significant at the 1 per cent level, which is the same as the results obtained from the two regression tests in the previous section.

7 Conclusions of the study

In this paper, we study whether listed companies are included in the shortable list as the independent variable and the readability of corporate financial statements as the dependent variable during the 12 years from the introduction of the shorting mechanism in China in 2010 to 2022, to examine whether the shorting mechanism can effectively enhance the readability of corporate financial statements, and to further study the mechanism of its impact. Its conclusion shows that the inclusion of firms in the shortable list leads to an increase in the readability of corporate financial statements. In terms of corporate governance, the better the corporate governance, the smaller the impact on the relationship between the two. In terms of whether or not the firm is losing money in the current year if the firm is not losing money in the current year, then it is beneficial to reduce its impact on the relationship between the independent variables and the explained variables. Further, to ensure the rigour of the research conclusions, this paper replaces the calculation of the readability index of financial statements, and adopts the new two approaches to measure the readability of financial statements, and after regression, it is found that the conclusions after replacing the variables are consistent with the previous conclusions.

The readability of corporate financial statements is now a major concern for investors and an issue of great interest to the current market. The Government hopes to enhance the transparency of enterprises by increasing the readability of their financial statements. To solve this problem, the government has adopted many methods, one of which is to set up a part of the enterprise as a shorting enterprise, through the research of this paper found that the enterprise will be added to the list of securities can effectively improve the readability of enterprise financial statements. The continued development of the short-selling mechanism in China may lead to new ways of monitoring corporate disclosure.

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