Spillover Effect of Punishment for Violation of Regulations and Trade Credit—— An Empirical Evidence Based on Director Chain Companies in China

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Abstract: Based on the perspective of spillover effect of punishment for violation of regulations, this article investigates the impact and mechanism of chain companies punished for violation on the trade credit of target company. Taking all A-share listed companies in Shanghai and Shenzhen Stock Exchanges of China from 2008 to 2017 as the research objects, the results show that the punishment for violation of regulations of chain companies with interlocking directors will improve the trade credit of target companies, reflecting the spillover effect of punishment for violation of regulations. The further tests show that the quality of accounting information plays a mediating role in the impact of chain company punished for violation on the trade credit of target company, and the network centrality can adjust the impact of chain companies punished for violation on the trade credit of target company. This article provides some useful enlightenment for listed companies to recognize and avoid violations and punishment and improve access to trade credit. It not only helps to improve the quality of listed companies, but also promotes the healthy development of capital market.

Keywords: spillover effect, trade credit, punishment for violation of regulations, earnings quality, network centrality

Introduction

At present, under the financial system with bank credit as the core, listed companies in China are facing strong financing constraints. Unlike general equity financing and debt financing, the existence of commercial credit as a low-cost financing mode mainly depends on the degree of trust between the supplier and the user as well as the difficulty of company capital turnover (Raiser et al., 2007). With the improvement of supply chain trading mechanism and the establishment of market reputation system, trade credit financing has gradually become an important means for listed companies to alleviate financing difficulties, and is frequently used in the activities of large or small and medium-sized companies (Peterson and Rajan, 1997; Atanasova and Wilson, 2003; Horen, 2005). Therefore, it is of great practical significance to study the influencing factors of trade credit. Most of the existing studies have revealed the influencing factors of the company's trade credit financing ability from the perspectives of supplier relationship, internal control governance environment, information disclosure quality and external market environment (Fabbri and Menicini, 2010; Zheng Jun et al., 2013; Chen Sheng Lan and Liu Xiaoling, 2018). However, most of the above are based on the internal and external environment of the same company to study the ability of trade

credit financing, and few studies focus on whether the behavior of other companies will have an impact on the trade credit.

Nowadays, the phenomenon of interlocking directors is very prominent in the global capital market, especially in China. The proportion of listed companies with concurrent directors in all listed companies increased from more than 84% in 2008 to much more than 94% in 2017, which indicates that it is unique and urgent to study directors' network relationship in China's capital market. There has been a great deal of empirical evidence that interlocking directors can transmit information among listed companies (Battiston, 2003; Barnea, 2009; Liu Yongtao et al., 2015; Zhou Xiaosu et al., 2017), and generate convergence of financing decisions, investment decisions and M&A decisions (Engelberg et al., 2013; Fracassi and Tate, 2012; Chen Yunsen and Zheng Dengjin, 2017; Ishii and Xuan, 2014). Then, based on the information transmission between listed companies by interlocking directors, whether there is spillover effect between chain companies and target companies when chain companies are punished for violations?

Strengthening market supervision is the main theme of China's capital market in recent years. With the strengthening of law enforcement and the improvement of the regulatory system, more and more listed companies have been investigated for violations of laws and regulations. Violations of listed companies are subject to inspection and punishment by the regulatory authorities (this article calls listed companies punished for violations) will have a negative impact on the continuing operation of listed companies. Large amounts of compensation can easily lead to the rupture of the company's capital flow, causing financial risks. At the same time, violations of the rules and punishments are negative news for companies. The companies will face the pressure of public opinion, and the reputation of the companies will be damaged, which is very harmful to the sustainable development of the companies. Therefore, it is urgent to study the punishment of listed companies for violation of regulations. Based on the above analysis, if the punishment for violation of regulations has spillover effect, will the punishment of chain companies with interlocking directors affect the trade credit of the target companies[1]? And what is the mechanism of the trade credit of the target companies affected by the punishment of the violations by the chain companies?

This article tries to solve the above questions by taking the listed companies of Shanghai and Shenzhen A shares in China from 2008 to 2017. The results show that punishment for violation of regulations of chain companies can improve trade credit, which proves that punishment for violation

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[1] For the convenience of writing, we abbreviate " the trade credit of the target companies " as "trade credit" in the following article. This article studies trade credit from the perspective of the target companies.

has spillover effect. Further analysis of the mechanism of the chain companies' impact on trade credit due to the punishment for violation of regulations shows that when chain companies are punished for violations, the target companies can improve the quality of accounting information to reduce information asymmetry, and then increase the acquisition of trade credit. In addition, directors with high degree of network centrality can adjust the relationship between the punishment for violation of regulations of chain companies and trade credit because of the information and control advantages. When chain companies are punished for violations, the higher degree of directors' network centrality is, the more beneficial to the acquisition of trade credit.

The possible contributions of this article are as follows. Firstly, the spillover effect of punishment for violation of regulations is explored. Unlike the existing literature on the direct consequences of regulatory sanctions on the punished object, we examine the impact of punishment for violation of regulations on the related non-punished object from the perspective of spillover effect, and examines the impact between companies linked by interlocking directors, verifying the spillover effect of punishment for violation of regulations, which is helpful to understand and avoid the punishment of violations. Secondly, it enriches the literature on the economic consequences of punishment for violation of regulations and expands the research on the influencing factors of trade credit. The existing literature on the economic consequences of punishment for violation of regulations mainly includes stock price (Chen et al., 2013; Xu Nianhang et al., 2013), market value (Karpoff et al., 2008), debt financing (Dou Wei et al., 2018), investment level (Yuan and Zhang, 2016) and so on. A large number of studies have explored the impact of trade credit on the size of listed companies (Wu et al., 2012; Sun Puyang et al., 2014), cash level (Wu et al., 2012; Sun Puyang et al., 2014), property rights (Yu Minggui and Pan Hongbo, 2010), and social responsibility (Zhang et al., 2014). However, the existing research mainly focuses on the influence of the same company, and few studies focus on how the impact among companies, especially among companies associated with interlocking directors. This article considers the impact of punishment for violation of regulations of chain companies on trade credit, which is of great supplementary significance. Thirdly, it explores the mechanism of the impact of punishment for violation of regulations of chain companies on trade credit. From the perspective of mediating effect and moderating effect, we analyses how the punishment for violation of regulations of chain companies affects trade credit, which has important theoretical and practical significance. It not only enriches the literature of the accounting information quality and network centrality, but also has certain reference significance for listed companies. Listed companies can increase trade credit by improving the accounting information quality, and can also moderate the impact of punishment for violation of regulations of

chain companies on trade credit by hiring directors with high degree of network centrality. Similarly, it highlights the importance of the accounting information quality and network centrality.

There are still some shortcomings in this article, which deserve further study. Firstly, the measurement of director network composed of interlocking directors is relatively rough, including "directors-directors", as well as "directors-independent directors", "independent directors-directors" and "independent directors-independent directors". Future research can be more precise, such as considering only the network relationship formed by the interlocking directors of "director-director" or "independent director-independent director". Secondly, this article is limited to the relationship network formed by the interlocking directors, and the director network is only a part of the relationship network. Future research can be extended to the social network formed by other social relations such as hometown and educational background (such as fellow townsmen and alumni), and further explore the governance of punishment for violation of regulations.

The remainder of the article is structured as follows. Section 2 presents the literature review. Section 3 introduces the theoretical analysis and hypothesis. Section 4 describes the sample selection and data source, variable definition and research model construction. Section 5 presents the empirical results and analysis, including descriptive statistics, regression results and further analysis results. Section 6 concludes.

Literature Review

The Influencing Factors of Trade Credit

Trade credit refers to the credit service provided by a company in the process of purchasing and selling based on mutual trust between buyers and sellers, which is essentially a financing method of the company (Allen, Qian and Qian, 2005; Lu Zhengfei and Yang Deming, 2011).

The existing literature discusses the influencing factors of trade credit from many aspects. Among them, the size and cash level of the supervisor company have a significant positive impact on trade credit (Wu et al., 2012; Sun Puyang et al., 2014), and the level of bank debt is negatively correlated with trade credit (Sun Puyang et al., 2014). Compared with state-owned enterprises, non-state-owned enterprises will use trade credit as a means of product market competition (Yu Minggui and Pan Hongbo, 2010), and managers with research experience (Wu Haohong and Qiu Xia, 2019) and higher corporate social responsibility can enable listed companies to obtain more trade credit (Zhang et al., 2014). In addition, there is also the impact of accounting information quality on trade credit. Based on the high-quality accounting information disclosure as an important factor affecting the trust degree between stakeholders in supply chain transactions (Yuan Weiqiu and Wang Lijing, 2016), disclosure of high-quality accounting information can reduce financing costs (Dhaliwal,

2011; Kim, 2011), and then increase trade credit financing (Xu Zhiwei et al., 2017). Besides, some scholars have also studied the impact of external factors on the company's commercial credit financing capacity, such as monetary policy (Allen, Qian and Qian, 2005; Lu Zhengfei and Yang Deming, 2011; Li Laifang, Zhang Weihua and Lu Qirui, 2018), supplier relationship (Ma Lijun, Zhang Min and Yizhihong, 2016), and company market competitiveness (Yu Minggui and Pan Hongbo, 2010; Ying Qianwei and Jiang Tianjiao, 2012) and so on, and discussed the mechanism and path of influencing the company's trade credit financing ability.

The Economic Consequences of Punishment for Violation of Regulations

There are not many literatures on the economic consequences of punishment for violation of regulations, and there is no unified conclusion. There are three main types of literature as follows:

One focuses on the negative effect of punishment for violation of regulations. The punishment of violations by regulatory authorities is a major negative news for listed companies, which will produce significant negative market reaction in the short term, to some extent, demonstrating the effectiveness of government supervision behavior (Chen Gongmeng and Gao Ning, 2005). Punishment for violation of regulations will most directly lead to stock price drops (Xu Nianhang et al., 2013), market value losses and reputation losses (Karpoff et al., 2008; CuWeihua and Xia Yufeng, 2012), which will restrain the company's risk-taking behavior (Pan Min and Wei Hairui, 2015), reduce the level of investment (Yuan and Zhang, 2016). Giannetti et al. (2016) empirical research also shows that the punishment for violation of regulations of listed companies will reduce the market participation of investors. In addition, punishment for violation of regulations also impairs the value of the company's creditor's rights (Zhou and Reesor, 2015). Companies punished for violations can obtain fewer bank loans, higher interest rates, shorter maturity, higher guarantee requirements (Graham et al., 2008), higher debt financing costs (Dou Wei et al., 2018), and more difficult financing.

The other focuses on the positive consequences of punishment for violation of regulations. The listed companies will be motivated to improve their governance quality after their punishment for violation of regulations (Farber, 2005). Both Li Wenjing (2007) and Fisch (2009) found that punishment for violation of regulations can significantly improve the quality of accounting information and reduce the negative relationship between corporate opacity and stock price synchronization (Gu Xiaolong, Xinyu and Tengfei, 2016). It provides empirical evidence for the governance effect of punishment for violation of regulations in capital market.

The third kind of study pointed out that the impact of punishment for violation of regulations was not significant, and investors did not overreact to the company's violation announcements. Wu

and Gao (2002) took listed companies punished by the CSRC as samples, and found that CAR was significantly positive in the [0,10] time window, but not in the [-10,10] and [-10,1] window periods. There was no significant difference in the reactions of investors to different types of violations (Feroz et al., 1991; Yang Zhonglian and Xie Xiangbing, 2008). Song Yunling et al. (2011) also showed that the punishment of violations by regulators did not play a deterrent effect, did not reduce the probability of violations of future performance forecast, and the punishment effect was not ideal. Similarly, Hao Xuguang, Zhu Bing and Zhang Shiyu (2012) found that market participants had a low evaluation of the overall regulatory effect of the regulators, and that the regulators had poor foresight, strictness and comprehensiveness in formulating policies.

Spillover Effect of Punishment for Violation of Regulations

Spillover effect originally refers to the phenomenon that when a container is filled with a solution exceeding its capacity, the solution overflows and then affects other devices outside the container. That is, when an organization carries out an activity, it will not only produce the expected effect of the activity, but also have an impact on people or society outside the organization, and its essence is an externality effect (Wang Qin et al., 2015).

At present, only a few studies show that punishment for violations of regulations has spillover effects. The punishment for violation of regulations will significantly affect the capital market performance and investment and financing behavior of their peers (Durnev and Angeln, 2009; Beatty et al., 2013). The personal reputation of analysts will also be affected by their purchase or sale ratings (Lee and Lo, 2016). In addition, punishment for violation of regulations can also significantly affect the market reaction and performance of other non-punished members of the group (Xinyu, Tengfei and Gu Xiaolong, 2019). Other studies have found that punishment for violation of regulations will affect unpunished auditors, resulting in lower fees for subsequent audits (Qian Aimin, Zhu Dapeng and Yu Zhi, 2018).

By reviewing the above literature, we can see that there are few studies on the spillover effect of punishment for violation of regulations. Most of the existing literature pays attention to the influence of punishment for violation of regulations within companies on other behaviors, while little attention is paid to the interaction between chain companies. In addition, few scholars pay attention to the relationship between punishment for violation of regulations and trade credit, especially the impact of punishment for violation of regulations of chain companies on trade credit. Therefore, this paper puts the punishment for violation of regulations of chain companies and trade credit into a research framework to explore the impact of the punishment for violation of regulations

of chain companies on trade credit and to verify the spillover effect of punishment for violation of regulations.

Theoretical Analysis and Hypothesis Presentation

When bank loans become unavailable due to credit rationing and discrimination, trade credit will become an alternative financing method for bank loans (Meltzer, 1960; Petersen and Rajan, 1997; Coulibalyetal., 2013), potentially providing timely and necessary financial support for enterprises that are difficult to obtain bank loans (Chen Lihua and Zeng Fusheng, 2013).

With regard to the motivation of trade credit, the existing research mainly includes transaction motivation, which can explain the differential pricing viewpoint and product quality assurance viewpoint of supplier's trade credit providing behavior (Bougheas et al., 2009; Klapper et al., 2012; Lu Zhengfei and Yang Deming, 2011). The other is financing motivation, trade credit plays an alternative role in bank financing (Ge and Qiu, 2007; Yu Minggui and Pan Hongbo, 2010; Lu Zhengfei and Yang Deming, 2011). The subdivision also includes comparative advantage theory of financing (Petersen and Rajan, 1997) and credit rationing theory (Biais and Gollier, 1997), which also explains why many listed companies still adopt commercial credit financing in the presence of bank credit. So, how will the punishment for violation of regulations of chain companies affect trade credit? The following is mainly from two aspects:

On the one hand, according to the theory of information transmission, chain companies and target companies may have similar business behavior. As an important "node" of director network, interlocking directors are the media of information transmission in different companies. Previous studies have shown that the interlocking directors has an impact on the choice of accounting policies, which leads to the convergence of accounting policies (Liu Yongtao et al., 2015). When chain companies punished for violation of regulations, investors will show a short and weak negative market reaction to the company where the punished independent director is located and the company where the punished independent director concurrently serves (Zhou Zejiang and Liu Zhongyan, 2015), further affecting the financing situation of the target company. In the credit crunch period, small enterprises facing capital constraints will rely more on trade credit financing (Nilsen, 2002). At this time, based on the theory of comparative advantage of financing, trade credit financing is an important channel for target companies to carry out finance, and target companies will increase trade credit.

On the other hand, according to the theory of reputation mechanism, the target company may improve its trade credit through the following two ways. First of all, from the perspective of corporate reputation, good corporate reputation is usually regarded as a valuable intangible asset

(Benjamin and Keith, 1981; Machteld, 2014), that is, "reputation capital" (Benjamin and Keith, 1981). The listed companies not only suffer similar direct losses such as fines, but also have a negative impact on them because of reputation damage. The "bad news" that chains are punished for violating regulations will deter and warn the target company. The target company will take it as a warning and pay more attention to the maintenance of the company's reputation. Corporate reputation is also one of the conditions of trade credit financing. Companies with high reputation can send a good signal of its credit level to trade credit providers, which reduces the uncertainty and information asymmetry of transactions between stakeholders and companies, and is conducive to the target company to obtain trade credit. Secondly, from the perspective of directors' reputation, reputation mechanism can restrain directors' opportunistic behavior, promote them to serve the company more diligently, and play an important incentive role in the development of directors' functions (Huang Haijie et al., 2013). Fich et al. (2007) found that false statements of listed companies constitute a serious reputation loss for independent directors. Therefore, in order to maintain the reputation of interlocking directors in the chain companies and target companies, interlocking directors are more motivated to actively participate in corporate governance when the chain companies they work in are punished for irregularities. Interlocking directors with high reputation are more conscientious and stronger professional proficiency (Yan Guoying and Xie Guanghua, 2017), which can effectively improve the operation of the target company, thereby increasing the trade credit of the target company. The above analysis shows that the punishment of chain companies will increase the trade credit of the target company, which shows that the punishment of the regulatory authorities has played its effective role. It also reflects the positive impact of punishment for violation of regulations and shows the spillover effect of punishment for violation of regulations. Based on this analysis, we put forward the following hypothesis:

H1: The punishment for violation of regulations of chain companies can improve trade credit, which verifies the spillover effect of punishment for violation of regulations.

Research Design

Sample Selection and Data Sources

We takes the data of all A-share listed companies in Shanghai and Shenzhen Stock Exchanges from 2008 to 2017 as research samples, and screens them according to the following criteria: (1) Excluding ST companies; (2) Excluding listed companies in the financial industry; (3) Excluding samples with asset-liability ratios less than 0 and greater than 1; (4) Excluding samples with missing financial data; (5) Excluding samples where directors do not hold concurrent positions in other listed companies; (6) Excluding the sample observations which the punishment for violation of regulations

of the target company, in order to effectively prove the spillover effect of the punishment for violation of regulations. After the above treatment, a total of 8517 company annual observations were obtained.

The relevant data of the property nature, listing date, the proportion of the largest shareholder and the calculation of accrued earnings management in this article are from WIND database, and the other data are from CSMAR database. In order to control the influence of extreme values, Winsorize tailing was performed on 1% and 99% of all continuous variables. In addition, PAJEK is used to calculate the network centrality, STATA15.0 software is used for data processing, and Robust command is used to correct the standard errors in multivariate regression, so that the results are more robust.

Definition of Variables

Trade Credit

There are many methods to measure trade credit, and they are not uniform. For example, Chen Zhenglin (2017) use the definition of accounts receivable divided by total assets to measure trade credit; He Weifeng and Liu Wei (2018) use the ratio of accounts payable to total liabilities to measure trade credit; Chen Shenglan and Ma Hui (2018) use the ratio of the sum of accounts payable, notes payable and advance receivables to sales cost as trade credit. Based on the research of Liu Eping and Guan Jingyi (2016), Chen Shenglan and Liu Xiaoling (2018) and Liu Huan (2019), we use the sum of accounts payable, notes payable and accounts receivable divided by total assets to measure trade credit (TC).

Punishment for Violation of Regulations of Chain Companies

Listed companies are subject to regulatory punishments and announcements for violating relevant laws and regulations of the CSRC or other regulatory authorities. We choose the year of announcement of punishment for violation of regulations as the year of punishment for violation of regulations of listed companies.

According to the punishment information of Listed Companies in the information form of violations in CSMAR database, the punishment methods include criticism, warning, condemnation, fine, confiscation of illegal income, cancellation of business license (order to close), market prohibition and others. When listed companies are punished for many violations within one year, only one sample of punishment is retained.

According to the codes of listed companies with interlocking directors in CSMAR database, all listed companies in the same year are paired together, and then merged with the data of punishment for violation of regulations, that is, the punishment information of the chain company

of the target company. In this article, the punishment for violation of regulations of chain companies is set as a dummy variable P. When the target company has more than one chain company to be punished for violating in one year, as long as there is a chain company to be punished for violating, the value is 1, otherwise it is 0.

It is worth noting that the target company may be punished for violations for several years in the sample period, while the spillover effect of the punishment for violation of regulations may have a lagging effect in time. In order to better verify the long-term effect of the spillover effect of punishment for violation of regulations, we further set up virtual variables P_after to express chain company which is punished for violations after eliminating the sample observation of the punishment for violations target company. When the chain company is punished for violation of regulations for the first time, the value of P_after for all years after that year is 1, and the value of P_after for all years before that year is 0.

Control Variables

As for the control variables, according to the existing literature, we choose profitability (ROE), growth ($Grow$), the proportion of independent directors ($Independ$), duality ($Dual$), first largest shareholder shareholding ratio ($First$), the size of the company ($Size$), asset liability ratio (Lev), the age of the company (Age), and property nature ($State$). In addition, the industry ($Industry$) and annual ($Year$) fixed effects are also controlled. The specific variable definition is shown in Table 1.

Table 1 Definition variables

Variable	Definition
Dependent variable	
TC (Trade credit)	Ratio of the sum of accounts payable, notes payable and accounts receivable to total assets.
Independent variable	
P_after (Punishnment for violation of regulations of chain company)	The chain company is punished for violations for the first time, the value of P_after for all years after that year is 1, otherwise is 0.
Mediating variable	
DA (Accrued earnings management)	The residual of formula (2) $\varepsilon_{i,t}$.
Moderating variable	
Degree (Degree centrality)	Calculated by formula (5).
Betweenness (Betweenness centrality)	Calculated by formula (6).

Control variables	
ROE (Return on net assets)	Ratio of net profit to shareholder equity balance.
Grow (Gross revenue growth rate)	Ratio of total gross revenue at the end of the year minus total gross revenue at the end of last year to total gross revenue at the end of last year.
Independ (Proportion of independent directors)	Proportion of independent directors to the total number of directors.
Dual (Duality)	If the chairman and general manager are concurrently appointed, the value of A is 1, otherwise is 0.
First (First largest shareholder shareholding ratio)	Proportion of the number of shares held by the largest shareholder to the total number of shares in the company.
Size (Size of the company)	Natural logarithm of total assets.
Lev (Age of the company)	Ratio of total liabilities to total assets.
State (Property nature)	If it is a state-owned enterprise, the value of A is 1, otherwise it 0.
Industry (Industry characteristics)	Industry dummy variables
Year (Year characteristics)	Year dummy variables

Research Model Construction

In order to test H1, we construct the following regression model to test the impact of chain company which is punished for violation of regulations on trade credit after eliminating the sample observations which target company is punished for violations:

$$TC_{i,t} = \alpha_0 + \alpha_1 P_{after_{i,t}} + \alpha_2 Control_{i,t} + \varepsilon_{i,t} \tag{1}$$

Among them, TC is trade credit; P_after is the punishment for violation of regulations of chain company; Control is the relevant control variables; α_0 is the constant term; α_1 is the regression coefficient of the punishment for violation of regulations of chain company and commercial credit; α_2 is the regression coefficient of control variables. $\varepsilon_{i,t}$ is the residual term.

Empirical Results and Analysis

Descriptive Statistics

Table 2 shows the descriptive statistics of the variables after excluding the observations of punishment for violations of the target company. In Table 2, there are 8571 sample observations, the mean value of TC is 0.171, the minimum value is 0.005, and the maximum value is 0.557, which indicates that there are obvious differences in trade credit level between different companies. The average value of P_after is 0.519 and the median value is 1, which indicates that the phenomenon of chain companies being punished for violation of regulations is more common. The descriptive

statistical results of other variables are detailed in Table 2, which are basically consistent with the existing studies, and will not be repeated here.

Table 2 Descriptive statistics

Variable	N	Mean	SD	Min	Median	Max
TC	8517	0.171	0.126	0.005	0.138	0.557
P_after	8517	0.519	0.500	0.000	1.000	1.000
ROE	8517	0.081	0.088	-0.288	0.078	0.329
Grow	8517	0.180	0.423	-0.529	0.112	2.885
Independ	8517	0.371	0.053	0.308	0.333	0.571
Dual	8517	0.197	0.397	0.000	0.000	1.000
First	8517	0.374	0.156	0.096	0.361	0.758
Size	8517	22.345	1.360	19.748	22.148	26.487
Lev	8517	0.445	0.200	0.053	0.443	0.869
Age	8517	2.234	0.708	0.693	2.398	3.219
State	8517	0.518	0.500	0.000	1.000	1.000

The regression result between the punishment of chain companies for violating of regulations and the trade credit

The column (1) in Table 3 shows the regression results of the trade credit affected by the punishment for violation of regulations the chain company. From the column (1) in Table 3, we can see that the regression coefficient of the punishment for violation of regulations the chain company and trade credit is significantly positive at the level of 10%, which shows that the chain company punished for violations can significantly improve the trade credit of the target company, and further verifies the spillover effect of punishment for violation of regulations. That is, the punishment for violation of regulations by chain companies has a deterrent effect on target companies. Interlocking directors will pay more attention to improving credit level in target companies, which will help to obtain trade credit, and H1 is supported.

Further Analysis: The Mechanism of the Punishment for Violation of Regulations by Chain Companies Affecting Trade Credit

The above results show that when chains are punished for violation, the target company can increase the acquisition of trade credit, which verifies that the punishment for violations of the listed company has spillover effect. Then, we will further analyze the mechanism of the punishment for violations of chain companies affecting trade credit.

The Mediating effect of Accounting Information Quality

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Under the circumstance of imperfect capital market and asymmetric information, listed companies can transfer the operation status to capital market by disclosing appropriate information. High-quality earnings information can transfer positive signals to investors to good production and operation performance, thereby reducing financing risks and financing costs (Feng Zhanbin, 2017).

In the normal sales process, there is a closer contractual relationship between the supplier and the user of trade credit, and the long-term cooperation between them can promote mutual understanding. It is easier for trade credit providers to collect information, evaluate reputation, control actions (Emery, 1987), timely recover property (Petersen and Rajan, 1997), better understand the production and operation of users, and real-time grasp the repayment ability of users. However, the information held by the provider and the user will not be identical, and the problem of information asymmetry always exists. Previous studies have shown that high-quality accounting information is the most direct source of information for trade credit providers to judge the financial risk and solvency of trade credit users (Hui et al., 2012). High-quality earnings information can reduce information asymmetry between providers and companies (Li Laifang et al., 2018), and become an important factor affecting trust between them (Yuan Weiqiu and Wang Lijing, 2016). Academic circles generally believe that robust and reliable accounting information reduces the degree of information asymmetry between the two sides of supply chain transactions, reduces the cost of debt supervision, and is the fundamental path to achieve trade credit in supply chain transactions (Hui, Klasa and Yeung, 2012).

In view of the above analysis, when the chain companies are punished for violating the regulations, the target company will be punished, which will increase its financing cost and lead to financing difficulties. Then, when chain companies are punished for violation of regulations, in order to ease financing constraints, can target companies improve trade credit by improving the quality of accounting information. That is, will the quality of accounting information play an mediating role in the impact of the punishment for violation of regulations of chain companies on trade credit?

In order to explore the above problems, we use the revised Jones model to calculate the accrued earnings management to measure the quality of accounting information (Dechow et al., 1995; Li Laifang, Zhang Weihua and Lu Qirui, 2018) based on the research of Sun Jian et al. (2016) and Du Xingqiang et al. (2017). The specific calculations are as follows:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_0 \frac{1}{A_{i,t-1}} + \alpha_1 \frac{\Delta REV_{i,t} - \Delta REC_{i,t}}{A_{i,t-1}} + \alpha_2 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{i,t} \tag{2}$$

Among them, $TA_{i,t}$ is the total accrued profit of the company i in year t; $A_{i,t-1}$ is the total assets of the company i in year $t-1$; $\Delta REV_{i,t}$ is the increase of operating revenue of the company i

in year t; $\Delta REC_{i,t}$ is the increase of accounts receivable of the company i in year t; $PPE_{i,t}$ is the fixed assets of the company i in year t; DA is used to represent accrued earnings management as a measure of the accounting information quality.

In order to test the mediating effect of accounting information quality, according to the mediating effect test model, we construct the following regression model to test the mediating effect of accounting information quality between the punishment for violation of regulations of chain companies and trade credit, as follows:

$$DA_{i,t} = \alpha_0 + \alpha_1 P\_after_{i,t} + \alpha_2 Control_{i,t} + \varepsilon_{i,t} \tag{3}$$

$$TC_{i,t} = \beta_0 + \beta_1 DA_{i,t} + \beta_2 P\_after_{i,t} + \beta_3 Control_{i,t} + \varepsilon_{i,t} \tag{4}$$

Among them, $DA_{i,t}$ is the accrued earnings management; $P\_after_{i,t}$ is the chain company's punishment for violation of regulations; Control is the relevant control variable; α_0 and β are the constant term; α_1 is the regression coefficient of chain company's punishment for violation of regulations and accrued earnings management; β_1 is the regression coefficient of accrued earnings management and trade credit; β_2 is the regression coefficient of chain companies' punishment for violation of regulations and trade credit; α_2 and β_3 are the regression coefficients of control variables; $\varepsilon_{i,t}$ is the residual term. According to the mediating effect model, when α_1 is significant in formula (3) and formula (5), β_1 is significant in formula (6). Accounting information quality plays a complete mediating effect if β_2 is not significant in formula (6). However, if β_2 is significant in formula (6), accounting information quality plays a partial mediating effect.

The column (2) in Table 3 shows the regression results of the punishment for violation of regulations of the chain companies and earnings management level. The column (2) shows that the regression coefficient of the punishment for violation of regulations of the chain companies and accrued earnings management is significantly negative at the level of 10%, which indicates that the chain companies punished for violations can significantly reduce the level of accrued earnings management of target companies and improve the quality of accounting information.

The column (3) in Table 3 shows the regression results of the impact the punishment for violation of regulations of chain companies and earnings management level on trade credit. The column (3) shows that the regression coefficients of the punishment for violation of regulations of chain companies and trade credit are significant positive at the level of 10%, while the regression coefficients of accrued earnings management and trade credit are negative at the level of 1%. According to the mediating effect model, accrued earnings management plays a part mediating effect in the trade credit affected by chain companies' punishment for violation of regulations. That is to say, the punishment of chain companies for violation of regulations can significantly reduce

the level of accrued earnings management of target companies, improve the quality of financial reports of target companies, reduce the information asymmetry, make suppliers more aware of the company's production and operation situation, reduce the cost of supervision, and thus promote the company to obtain trade credit financing. It further validates the spillover effect of punishment for violation of regulations, and also shows that the quality of accounting information plays a mediating effect on the punishment of chain companies for violation of regulations and trade credit.

Table 3 Regression results of the punishment of chain companies for violation of regulations and trade credit and accounting information quality

	（1）	（2）	（3）
	TC	DA	TC
P_after	0.004*	-0.004*	0.004*
	(1.91)	(-1.88)	(1.67)
DA			-0.142***
			(-10.72)
ROE	0.243***	0.190***	0.270***
	(17.24)	(13.11)	(18.94)
Grow	-0.001	-0.006	-0.002
	(-0.24)	(-1.39)	(-0.56)
Independ	-0.079***	0.012	-0.077***
	(-4.25)	(0.66)	(-4.20)
Dual	0.003	-0.002	0.003
	(1.24)	(-0.68)	(1.16)
First	0.050***	-0.020***	0.047***
	(6.88)	(-2.82)	(6.57)
Size	-0.009***	0.004***	-0.008***
	(-7.78)	(3.81)	(-7.29)
Lev	0.347***	-0.052***	0.340***
	(46.93)	(-7.62)	(46.21)
Age	-0.010***	0.003	-0.009***
	(-5.75)	(1.58)	(-5.58)
State	0.014***	-0.002	0.014***
	(5.57)	(-1.03)	(5.50)

Constant	0.185***	-0.088***	0.173***
	(7.92)	(-4.00)	(7.48)
Industry	control	control	control
Year	control	control	control
N	8517	8517	8517
Adjusted R^2	0.470	0.065	0.479
F	160.242	14.841	162.711

Note: The data in parentheses are t value, * indicates significant at the level of 10%, ** indicates significant at the level of 5%, and *** indicates significant at the level of 1%, the same below.

The Moderating Effect of Network Centrality

Director network is a kind of relationship network connected by interlocking directors, which can play the role of information sharing and communication (Granovetter, 1985) and resource exchange (Lin Nan, 2002). It has been proved that interlocking directors can transmit information between the chain company and the target company, the punishment of the chain company for violations has spillover effect, which will significantly improve the trade credit. Since the interlocking directors play such an important role between the chain company and the target company, will the position of directors in the director network affect the relationship between the chain company's punishment for violation of regulations and trade credit?

In order to solve the above problems, we further examine the network centrality. Network centrality is an important variable to examine the whole director network. It is also an index to evaluate the importance of a director, the superiority or privilege of his position, and the social prestige. Regarding the moderating effect of network centrality on the punishment of chain companies for violations and trade credit, we mainly explain from the following three aspects: Firstly, the closer the directors are to the center of the network, the more information and professional knowledge they get, and the higher their decision-making influence (Chen Xu and Jin Yingzi, 2015). Moreover, the information exchange and sharing of director network will reduce the information asymmetry between companies. When the network centrality is high, it can make up for the deficiencies of the social credit system which is imperfect and difficult to obtain the credit status of trade credit users, and ensure the provision of trade credit. Secondly, the director network is actually an alternative mechanism for legal restraint and punishment of violations. When chain companies are punished, their target companies and interlocking directors may have to bear high reputation costs based on the information transmission effect. Directors in the center of network have a high reputation, and reputation mechanism has the greatest influence on directors. Therefore,

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the higher the degree of network centrality, the more attention the board attaches to maintaining its reputation, which in turn will promote trade credit providers to provide trade credit to companies with high degree of network centrality. Thirdly, the director network is easy to establish trust relationship between the two sides of the transaction, and trust will promote trade credit providers to provide trade credit to users (Liu Fengwei et al., 2009). The information advantage and control advantage of directors with high network centrality can make the company gain the trust of trade credit providers, reduce the uncertainty of transactions and increase the acquisition of trade credit. Therefore, we argue that network centrality can moderate the impact of the punishment for violation of regulations of chain companies and trade credit, and further verifies the spillover effect of punishment for violation of regulations.

Before measuring the degree of network centrality, we learn about the director network. Based on the existing research, this article uses the large scale social network data analysis software PAJEK to transform the "two mode" network of "directors - companies" into a "model" network of "directors - directors" with directors as the network nodes, and reflects the network structure by taking the median degree of network centrality of all interlocking directors of listed companies(Zhao Xin、Xu Jie and Ding Lili, 2018).

As for the measurement of network centrality, existing literature often use three indexes: degree centrality, betweenness centrality and closeness centrality (Chen Yunsen and Xie Deren, 2011). Since the closeness centrality is based on the sum of the distances between the vertex and all other vertices, it requires the network must be a fully connected graph, so the index is seldom used. Therefore, this paper chooses two indexes to measure the directors' network centrality of listed companies: degree centrality (Chen Yunsen and Xie Deren, 2012; Larcker and Wang, 2013; Lu Xianwei, 2013; Bao Fenghua, 2018) and betweenness centrality (Chen Yunsen and Xie Deren, 2012; Chen Yunsen, 2015; Zuo Xiaoyu and Sun Qian, 2018). The detailed calculation is as follows:

Degree centrality (Degree), which indicates the number of direct connections between a director and other directors, which reflects the activity of individuals in the network, and is also the most intuitive measurement of the centrality of the network position. The formula is:

$$Degree_i = \frac{\sum_j X_{ji}}{g-1} \tag{5}$$

Among them, i is a director, j is a director other than i, and X_{ji} is a network connection; If director i and director j are members of at least one company, the value is 1, and vice versa is 0; g is the total number of directors of a listed company in that year; (g-1) is used to eliminate the differences in the number of directors of listed companies in different years.

Betweenness centrality (Betweenness) reflects the ability to control the connections of other directors in the network. The formula is:

$$Betweenness_i = \frac{\frac{\sum_{j<k} g_{jk(n_i)}}{g_{jk}}}{\frac{(g-1)(g-2)}{2}} \tag{6}$$

Among them, g_{jk} is the number of non-repetitive and shortest paths that director j and director k must go through; $g_{jk(n_i)}$ is the number of directors i in the shortest path which director j and director k do not repeat; $\sum_{j<k} g_{jk(n_i)}/g_{jk}$ is the number of directors i in all other "directors-directors" links in the whole director network and the number of directors i in the shortest path. Similarly, g is the total number of directors of listed companies in the current year. Because the number of directors of listed companies is different in different years, we use (g-1) (g-2)/2 to eliminate the scale difference.

In order to test the moderating effect of network centrality, a regression model is constructed to test the moderating effect of network centrality the punishment for violation of regulations of chain companies and trade credit by introducing the interaction term of network centrality and the punishment for violation of regulations of chain companies.

$$TC_{i,t} = \alpha_0 + \alpha_1 P_{after_{i,t}} + \alpha_2 Center_{i,t} + \alpha_3 P_{after_{i,t}} * Degree_{i,t} + \alpha_4 Control_{i,t} + \varepsilon_{i,t} \tag{7}$$

Among them, $TC_{i,t}$ is trade credit; $P_{after_{i,t}}$ is the punishment for violation of regulations of chain companies; $Center_{i,t}$ is network centrality, which is represented by Degree centrality and Betweenness centrality; $Control_{i,t}$ is related control variables; α_0 is constant term; α_1 is regression coefficient of chain companies punished for violation of regulations; α_2 is regression coefficient of network centrality; α_3 is the regression coefficient of the interaction term between the network centrality and the punishment for violation of regulations of chain companies; α_4 is the regression coefficient of the control variables; $\varepsilon_{i,t}$ is the residual term.

Table 4 shows the regression results of the network centrality moderating the impact of the punishment for violation of regulations of chain companies on the trade credit. From Table 4, it can be seen that the interaction coefficient between degree centrality and the punishment for violation of regulations of chain companies is significant positive at 5% level, while that interaction coefficient between betweenness centrality and the punishment for violation of regulations of chain companies is significant positive at 1% level, which shows that the larger the degree of network centrality, the greater the punishment for violation of regulations of chain companies will significantly increase trade credit. The more directors are in the center position of the network, the more information and resources they have, the more effective they can adjust the impact between the punishment for violation of regulations of chain companies. and trade credit. It proves again that

punishment for violation of regulations has spillover effect, and the moderating effect of network centrality is supported.

Table 4 The regression results of the network centrality moderating the impact of the punishment for violation of regulations of chain companies on the trade credit

	TC	TC
P_after	-0.009	0.003
	(-1.35)	(1.40)
Degree	-0.001	
	(-1.56)	
Betweenness		-4.206
		(-0.59)
P_after*Degree	0.001**	
	(2.17)	
P_after*Betweenness		19.708*
		(1.88)
ROE	0.243***	0.243***
	(17.19)	(17.20)
Grow	-0.001	-0.001
	(-0.21)	(-0.24)
Independ	-0.080***	-0.081***
	(-4.27)	(-4.33)
Dual	0.003	0.003
	(1.21)	(1.17)
First	0.049***	0.049***
	(6.76)	(6.79)
Size	-0.009***	-0.009***
	(-7.61)	(-7.82)
Lev	0.347***	0.347***
	(46.91)	(46.87)
Age	-0.010***	-0.010***
	(-5.81)	(-5.83)
State	0.014***	0.014***

	(5.55)	(5.59)
Constant	0.193***	0.189***
	(8.16)	(8.02)
Industry	control	control
Year	control	control
N	8517	8517
Adjusted R^2	0.470	0.470
F	152.577	152.514

Robustness Test

Alternative Variable

Referring to Wang Juan's research (2019), we use the ratio of the sum of accounts payable, notes payable and accounts receivable to total liabilities to re-measure trade credit, which is expressed by TC1. Formulas (1), (3), (4) and (7) are regressed and the following table 5 is obtained in turn.

The column (1) in Table 5 shows the robustness test results of the trade credit affected by the punishment for violation of regulations of chain companies. From the column (1) in Table 5, we can see that the regression coefficient between the punishment for violation of regulations of chain companies and the trade credit is significant positive at the level of 10%, which shows that the punishment for violation of regulations of chain companies can significantly improve the trade credit of target companies, reflects the spillover effect of the punishment for violation of regulations, and also verifies H1 again.

The column (2) in Table 5 shows the robustness test results of earnings management level affected by the punishment for violation of regulations of the chain companies. The column (2) shows that the regression coefficient of the punishment for violation of regulations of the chain companies and accrued earnings management is significantly negative at the level of 10%, which shows that the punishment for violation of regulations of the chain companies can significantly reduce the level of accrued earnings management of target companies and improve the quality of accounting information.

The column (3) in Table 5 shows the results of the robustness test of the punishment for violation of regulations of chain companies and earnings management level on trade credit. The column (3) shows that the regression coefficients of the punishment for violation of regulations of chain companies and trade credit are not significant. The regression coefficients of accrued earnings management and trade credit are negatively significant at the level of 1%. According to the

mediating effect model, accounting information quality plays a full mediating role in the impact of the punishment for violation of regulations of chain companies on trade credit, which is in line with the previous article. The results of the study are generally consistent, which also illustrates the spillover effect of the punishment for violation of regulations, and verifies the mediating effect of accounting information quality again.

Table 5 The robustness test results of the punishment of chain companies for violation of regulations and trade credit and accounting information quality

	（1）	（2）	（3）
	TC	DA	TC
P_after	0.004*	-0.004*	0.004*
	(1.91)	(-1.88)	(1.67)
DA			-0.142***
			(-10.72)
ROE	0.243***	0.190***	0.270***
	(17.24)	(13.11)	(18.94)
Grow	-0.001	-0.006	-0.002
	(-0.24)	(-1.39)	(-0.56)
Independ	-0.079***	0.012	-0.077***
	(-4.25)	(0.66)	(-4.20)
Dual	0.003	-0.002	0.003
	(1.24)	(-0.68)	(1.16)
First	0.050***	-0.020***	0.047***
	(6.88)	(-2.82)	(6.57)
Size	-0.009***	0.004***	-0.008***
	(-7.78)	(3.81)	(-7.29)
Lev	0.347***	-0.052***	0.340***
	(46.93)	(-7.62)	(46.21)
Age	-0.010***	0.003	-0.009***
	(-5.75)	(1.58)	(-5.58)
State	0.014***	-0.002	0.014***
	(5.57)	(-1.03)	(5.50)
Constant	0.185***	-0.088***	0.173***

	(7.92)	(-4.00)	(7.48)
Industry	control	control	control
Year	control	control	control
N	8517	8517	8517
Adjusted R^2	0.470	0.065	0.479
F	160.242	14.841	162.711

Table 6 shows the results of the robustness test of the network centrality moderating the impact of the punishment for violation of regulations of chain companies on the trade credit. From Table 6, it can be seen that the interaction coefficient between degree centrality and the punishment for violation of regulations of chain companies is significant at 5% level, and the interaction coefficient between betweenness centrality and the punishment for violation of regulations of chain companies is also significant at 5% level, which shows that when the degree of network centrality is greater, the punishment for violation of regulations of chain companies will significantly increase business credit, as mentioned above. The results of the article are basically consistent, reflecting the spillover effect of the punishment for violation of regulations, and verifying the moderating effect of network centrality again.

Table 6 The robustness test results of the network centrality moderating the impact of the punishment for violation of regulations of chain companies on the trade credit

	TC1	TC1
P_after	-0.020	0.007
	(-1.43)	(1.24)
Degree	-0.002	
	(-1.57)	
Betweenness		-18.831
		(-1.17)
P_after*Degree	0.003**	
	(2.26)	
P_after *Betweenness		44.532**
		(2.08)
ROEa	0.404***	0.404***
	(15.16)	(15.19)
Trevenue	-0.002	-0.003

	(-0.42)	(-0.46)
Independ	-0.199***	-0.197***
	(-4.90)	(-4.91)
dual	0.007	0.007
	(1.26)	(1.24)
First	0.064***	0.064***
	(4.08)	(4.11)
Size	-0.018***	-0.018***
	(-8.56)	(-8.82)
Lev	-0.138***	-0.138***
	(-9.13)	(-9.15)
Age	-0.044***	-0.044***
	(-11.33)	(-11.31)
State	0.036***	0.036***
	(6.90)	(6.95)
Constant	0.863***	0.852***
	(17.34)	(17.20)
Industry	control	control
Year	control	control
N	8517	8517
Adjusted R^2	0.287	0.287
F	111.989	111.659

Propensity Score Matching (PSM)

We use the Propensity Score Matching (PSM) to reduce the sample selectivity error. In addition, PSM can also reduce the endogenous problems in corporate finance. The specific methods are as follows:

Firstly, the whole sample is divided into two groups according to whether all the chain companies are punished for violating of regulations during the sample period. If there are the samples which chain companies are punished for violating of regulations during the sample period, then P_all=1, constitutes the treatment group, otherwise P_all=0, constitutes the control group.

Secondly, the following model (8) is used for logit regression to estimate the propensity score (P-Score value) of all samples. It is worth pointing out that in order to ensure the accuracy of matching and avoid the control group sample being selected as the matching sample, in the treatment

group, we only select the annual observation value (P_once=1) of the company in the year when the chain company punished for violating of regulations for the first time, and then calculate P-Score value according to these observations and the observations of the control group. In addition, when a matching company whose P-Score value is closest to the chain company punished for violating of regulations and its target company is found, the processing year of the hypothesis is designated for the matching company. For example, the target company A had the observation of the chain company punished for violating of regulations in 2008. After finding the company B with the closest P-Score value in 2008, the target company A designated 2008 as the processing year of the company B hypothesis.

We use the Nearest Neighbor Matching method for 1:1 matching. Besides, the following conditions should be satisfied when matching: (1)Matching by year; (2) Matching by backtracking in the same year, which has been selected as the observation of paired samples in this year, and matching can also be taken in the same year. (3) There is no reset between years.

$$Logit_{i,t}\left(P_{all_{i,t}} = 1\right) = \alpha_0 + \alpha_1 Control_{i,t} + \varepsilon_{i,t} \tag{8}$$

$Control_{i,t}$ is a matching covariable, which is the same as the control variable above.

Finally, after the paired group is obtained, the results of the paired group and the treatment group are merged together. At this time, both the paired group and the treatment group have the processing year, and then merge with the data before the pairing to obtain the information of the relevant variables.

The matching results are as follows. Figures 1 and 2 show the density function graph of the treatment group and the control group before and after matching, respectively. The P-Score value of the control group was higher than that of the treatment group before the match, and the deviation between the two groups was larger. After matching, the P-Score values of the two groups were basically the same. The results show that the treatment group and the control group have reached the common support standard after propensity score matching, which again verifies the robustness of the conclusions in this article.
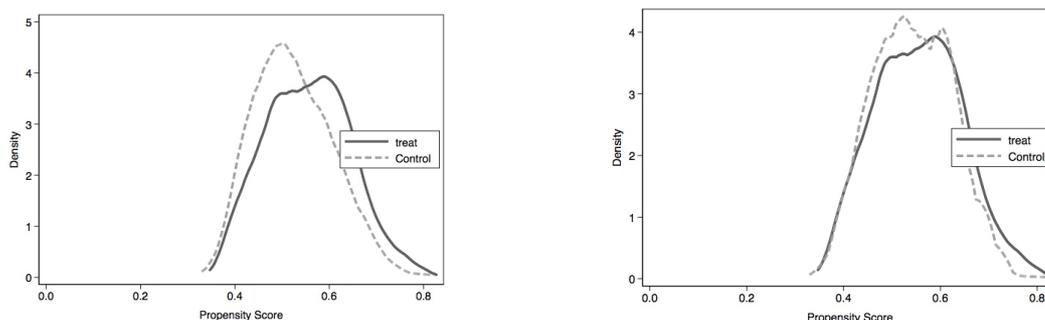
Figure 1 Density function graph before matching   **Figure 2 Density function graph before matching**

Conclusions

Using the data of Chinese A-share listed companies from 2008 to 2017 as research samples, we examine the spillover effect of the punishment for violation of regulations and empirically analyses the relationship between punishment for violation of regulations of chain companies and trade credit. The results present that the punishment for violation of regulations of chain companies can significantly increase trade credit, which verifies that punishment for violation of regulations has spillover effect. Further examining the mechanism of the punishment for violation of regulations of chain companies affecting the trade credit, we find that when chain companies are punished for violation of regulations, high-quality accounting information can reduce the information asymmetry between trade credit providers and companies, which makes it easier for providers to understand the company's production and operation conditions, thus promoting the company to obtain trade credit. Moreover, the higher the director network centrality is, the higher their reputation, and the more channels they have to obtain information and resources. The information advantages and control advantages generated by the central position can effectively reduce the information asymmetry, increase the trust of trade credit providers to the company, and then increase the acquisition of trade credit of listed companies. We also use the alternative variables of trade credit and the propensity score matching method to control sample selection bias to test the robustness, and finds that the conclusion of this article is still valid. Generally speaking, the punishment for violation of regulations has spillover effect, and it can significantly increase trade credit by improving network centrality.

Our research shows that regulatory authority is not a "vase". The punishment for violation of regulations is valid and has the spillover effect, which plays a certain role in deterring the listed companies with interlocking directors. Therefore, for listed companies, when chain companies with interlocking directors are punished for violation of regulations, other companies should "self-review", timely strengthen the governance, improve the quality of accounting information, and increase the trust of investors. Besides, the company can employ directors in the network center position to improve the ability to access information and resources, not only can help alleviate the financing problem, more conducive to the development of the company.

Main References

Allen, F., J. Qian, M. Qian. 2005. Law, finance, and economic growth in China. *Journal of Financial Economics* 77(1):57-116.

Battiston, S., G. Weisbuch, E. Bonabeau. 2003 Decision spread in the corporate board network. *Advances in Complex Systems* 6(4):631-644.

Beatty, A., S. Liao, J. J Yu. 2013. The spillover effect of fraudulent financial reporting on peer firms' investments. *Journal of Accounting & Economics* 55(2-3):183-205.

Benjamin, K.，B. L. Keith. 1981. The role of market forces in assuring contractual performance. *The Journal of Political Economy* 89(4):615-641.

Biais, B., C. Gollier. 1997. Trade credit and credit rationing. *Review of Financial Studies* 10:903-937.

Chen, S. L., X. L. Liu. 2018. Economic policy uncertainty and corporate trade credit extension. *Journal of Financial Research* (05):172-190.

Chen, Y. S. 2015. Director's structural hole' position and firm's policy efficiency. *Accounting Research* (01):48-55+97.

Chen, X., Q. Cheng, A. K. Lo. 2013. Accounting restatements and external financing choices. *Contemporary Accounting Research* 30(2):750-779.

Chen, Y. S., D. J. Deng. 2017. Board network, information bridge and corporate investment convergence. *Nankai Business Review* 20(03):159-171.

Chen, Y. S., D. R. Xie. 2011. Network location, independent director governance and investment efficiency. *Management Word* (07):113-127.

Coulibaly，B.，H. Sapriza, A. Zlate. 2013. Financial frictions, trade credit and the 2008-2009 Global Financial Crisis. *International Review of Economics & Finance* 26:25-38.

Engelberg, J., P. Gao, C. A. Parsons. 2013. The price of a CEO's rolodex. *Review of Financial Studies* 26(1):79-114.

Fabbri, D., A. M. C. Menichini. 2010. Trade credit, collateral liquidation, and borrowing constraints. *Journal of Financial Economics* 96(3):413-432.

Fracassi, C., G. Tate. 2012. External networking and internal firm governance. *The Journal of Finance* 67(1):153–194.

Giannetti, M, T. Y. Wang. 2016. Corporate scandals and house-hold stock market participation. *The Journal of Finance* 71(6):2591-2636.

Graham, J. R., S. Li, J. P. Qiu. 2008. Corporate misreporting and bank loan contracting. *Journal of Financial Economics* 89(1):44-61.

Gu, X. L., Y. Xin, F. Teng.2016. Do external enforcement actions have governance effect? Discussion on the duality of stock price synchronicity indicators. *Nankai Business Review* 19(5):41-54.

He, W. F., W. Liu. 2018. Managerial effects in business credit: from the perspectives of manager ability. *Accounting Research* (02):48-54.

Hui, K. W., S. Klasa, P. E. Yeung. 2012. Corporate suppliers and customers and accounting conservatism. *Journal of Accounting Economics* 53(2):115-135.

Ishii, J., Y. Xuan. 2014. Acquirer-target social ties and merger outcomes. *Journal of Financial Economics* 112(3):344-363.

Karpoff, J., D. S. Lee, and G. S. Martin. 2008. The consequences to managers for cooking the books. *Journal of Finance Economics* 8(2):193-215.

Kim, J.B., B. Y. Song., L. Zhang. 2011. Internal control weakness and bank loan contracting: evidence from SOX section 404 disclosures. *The Accounting Review* 86(4):1157-1188.

Klapper, L., L. Laeven, R. Rajan. 2012. Trade credit contracts. *Review of Financial Studies* 25(3):838-867.

Larcker, D.F., E. C. So, C. C. Wang. 2013. Boardroom centrality and firm performance. *Journal of Accounting and Economics* 55(2):225-250.

Lee, L. F., A. K. Lo. 2016. Do opinions on financial misstatement firms affect analysts' reputation with investors? Evidence from reputational spillovers. *Journal of Accounting Research* 54(4):1111-1148.

Li, L. F., W. H. Zhang, Q. R. Lu. 2018.How does quality of accounting information impact debt financing in private enterprises? The role of monetary policy. *Accounting Research* (04):66-72.

Lu, Z. F., D. M. Yang. 2011. Trade credit: Alternative financing or buyer's market. *Management World* (04):6-14+45.

Machteld, V. D. B., A. Walter. 2014 Media reputation of a firm and extent of trade credit supply. *Corporate Reputation Review* 17(1):28-45.

Petersen, M. A., R. G. Rajan. 1997. Trade credit: theories and evidence. *Review of Financial Studies* 10(3):661-691.

Qian, A. M., D. P. Zhu, Z. Yu. 2018. Do Regulatory Sanctions for listed companies implicate unpunished auditors? *Auditing Research* (03):63-70.

Raiser, M., A. Rouso, F. Steves, et al. 2007. Trust in transition:cross-country and firm evidence. *The Journal of Law, Economics & Organization* 24(2):407-433.

Wu, L., Q. Gao. 2002. A study of market reaction to the punishment bulletins. *Economic Science* (3):62-73.

Yu, M. G., H. B. Pan. 2010. Financial development, trade credit and product market competition. *Management World* (08):117-129.

Yuan, Q. B., Y. Y. Zhang. 2016. The real effects of corporate fraud: evidence from class action lawsuits. *Accounting & Finance* 56(3):879-911.

Zhang，M.，L. Ma，J. Su，and W. Zhang. 2014. Do suppliers applaud corporate social performance? *Journal of Business Ethics* 121(4):543-557.

Zhou, X. H., R. M. Reesor. 2015. Misrepresentation and capital structure: quantifying the impact on corporate debt value. *Journal of Corporate Finance* 34:293-310.