Financial development, internal control, and trade credit:Evidence from Chinese listed SMEs' empirical data

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Abstract. Trade credit, as a substitute for bank credit, can ease the financing difficulties of small and medium-sized firms to a certain extent. This paper empirically tests the effect of financial development and internal control on trade credit. Empirical results show that enterprises with high-quality internal control obtain more trade credit easily. Compared with the firms in the high level of financial development areas, in the lower-level areas, firms' internal control quality has a significant effect on trade credit. We also found that non-state owned firms have difficulty obtaining trade credit. This article not only verified the economic consequences of internal control but also elucidated financial development and trade credit factors.

1. Introduction

Firms' internal control can improve the reliability of accounting information (Doyle et al, 2007a,b). This study focuses on the economic consequences of internal control. In recent years, scholars have studied the economic consequences of internal control from the perspective of investment efficiency, cost of capital, and market reaction (Doyle et al., 2007a,b; Chen and Zhou, 2014). More perfect capital markets exist to protect investors in developed countries. The markets considered that internal control could improve the reliability of accounting information. Studies have found that internal control could help improve the quality of accounting information (Doyle et al., 2007b; Ashbaugh-Skaife, Collins, and Kinney 2008). In this manner, internal control could increase confidence between firms and stakeholders. Internal control can not only reduce the cost of equity capital but also reduce the cost of debt financing (Dhaliwal et al., 2011). However, we wonder whether internal control would affect trade credit, such as that for suppliers and customers. Zheng et al. (2013) found that listed companies with a higher quality of internal control are likely to obtain more trade credit. Only a small amount of research on small and medium enterprises (SMEs) exists. Trade credit is especially important for Chinese SMEs because, under the current circumstances, funds and equity are relatively difficult to obtain from banks. Yano and Shiraishi (2012) discovered that trade credit was more efficient than bank financing through the Chinese township enterprises' data for 1999–2006. Thus, trade credit is a useful way for SMEs to secure funds for their survival and development. Would improved quality of internal control ease the SMEs' financing difficulties? To address this issue, research on internal control and trade credit is valuable.

Whether or not financial development could promote economic growth, scholars emphasized that financial development had a positive role in economic growth (King and Levine, 1993a). A number of scholars posited that financial development had a limited, even negligible, role in economic growth. The relationship between financial development and macroeconomic growth has not been a definite conclusion. A number of studies have been conducted from a microeconomics view in developed countries. Studies have shown that financial development could reduce the cost of external financing in firms, which could promote the firms' growth (Laeven, 2003). Arellano et al. (2012) argued that small firms, especially new entrants, would experience slower growth rates, but their leverage ratio would increase with the improvement of financial development. However, Allen et al. (2005) found that although the formal Chinese financial system was still relatively

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backward, the economic growth rate of China was much faster than that of other countries. China is thus a special case compared with other countries. Furthermore, non-state sectors are the main driving force of economic growth in the entire economy compared with state sectors. SMEs have financing constraints in China. Moreover, financing problems commonly exist in SMEs. Improving financial development could reduce the reliance on internal cash flow in firms. Financing improvement could also ease the financing constraints of firms and reduce financial pressure, thereby promoting the development of the economy. With the use of 36 country-year data, Love (2003) also found that a significantly negative relation exists between financial development and investment cash flow sensitivity. This effect on financing constraints in lower financing development countries is particularly significant. Recent research on developing countries suggests that financing development can reduce dependence on internal cash flow. Financing development also alleviates the degree of external financing constraints (Ghosh, 2006).

Either way, this issue is important because trade credit would also be affected by financial policy. The effect of firms' internal control on trade credit lacks empirical testing. A lack of empirical testing in China or other emerging market countries should not exist because trade credit is important in these countries. Our research not only increases the literature on internal control but also provides empirical evidence to support the debate about forced internal control. The Chinese Ministry of Finance and other five ministries jointly issued "The basic standard of internal control" in 2008, which promulgated the guidelines for supporting the standard in 2010. This standard requires listed firms to self-evaluate the effectiveness of internal control. Then, listed firms should disclose their annual self-evaluation report. Listed firms could also employ accounting firms that specialize in securities and future goods qualification to audit the effectiveness of their internal control. The need for enforcement of internal controls is controversial because of cost issues. Internal control quality and trade credit problem belong to research on the economic consequences of internal control.

In this paper, we use the internal control quality index data of Chinese listed SMEs. We investigate the influence of internal control quality on trade credit financing. We also use fractional analysis according to financing development and nature of equity. This article may have certain contributions to the literature. First, the conclusions will help Chinese listed SMEs to be aware of the importance of internal control. Previous literature mainly focuses on the influence of internal control quality on debt financing on the basis of mature capital markets in developed countries. Articles on capital markets in developing countries, especially those of SEM listed firms, were few. Second, we consider the financing development factor into our research, thereby making our research different from previous research. We analyze the effects of internal control on trade credit on the basis of the degree of financial development. The analysis covers the characteristics of the difference in the development of Chinese regional practical financing. Our conclusion will be helpful in strengthening the construction of a trade credit environment according to actual circumstances in the local government.

2. Background and Hypotheses

2.1. Internal Control and Trade Credit

Trade credit is an alternative to bank loans. Trading partners supervise other firms by knowing about other firms' financial situation. Then, trade partners could adjust their business credit policy on the basis of other firms' financial information. Burkart and Ellingsen (2004) considered information of operation activities, financial situation, and competition in the industry as more advantageous to suppliers and other business partners compared with banks. Thus, trading partners will allow other partners to defer payment or give a higher discount except for the normal trading relationship based on superiority. Raman and Shahrur (2008) believed that firms are motivated by earnings management, which also affects the expectation of trading partners. Goh and Li (2011) thought that internal control quality would affect the quality of accounting information. More

internal control problems would lead to lower accounting information quality. Hui et al. (2012) argued that trading partners have quality requirements for an enterprise's robustness and reliability in accounting information in trade credit. Therefore, the quality of firms' financial information will affect the relationship between firms and their trading partners. It will also affect firms' trade credit. Elbannan (2009) argued that companies with lower quality of internal control were more likely to have a lower credit rating, which would make them have less income in the capital market and higher debt financing costs. The use of trade credit can transmit reputation signals. In particular, a greater scale of trade credit available to the firm corresponds to a better reputation that it will gain in the transaction with the supplier, and the firm will also gain increased trust from the supplier, which also reflects stronger solvency. At this point, trade credit has become banks' reference factor to decide whether or not to provide loans. An enterprise with a high level of trade credit also has more possibility of obtaining more bank loans.

On the one hand, high quality of internal control can alleviate agency problems. On the other hand, it can transmit agent problems to cooperative enterprises. Good internal control as a corporate internal system arrangement incentivizes and supervises managers, thus reducing agency problems. Agency problems mean that the executives will damage the interests of the company, including the interests of the stakeholders, such as trading partners. An internal control system, as a kind of internal institution, includes the internal control environment, risk control, stimulation, and monitoring. The internal control system helps a firm increase senior managers' decision making ability, which is also helpful in stimulating and supervising the staff. Thus, the internal control system will reduce the agency problem. Johnstone et al. (2011) argued that a high quality of the internal control system provided an effective means of solving agency problems. Zhou et al. (2016) argued that effective internal control can inhibit the corruption induced by management power and increase the value of a company. If a company's senior managers have serious agency problems, then they will be restricted by another company's high internal control system in the trade credit activities. Then, the senior managers will have a sense of crisis, which will push them to improve internal control and reduce agency costs. These pointers will increase the efficiency of a company. Lu et al. (2011) argued that effective internal control can restrain self-interest, and executives will make up their own interests by linking pay and performance.

Information on internal control can stabilize the relationship between firms and trading partners. Good communication about internal control can reduce information asymmetry. El-Mahdy and Park (2014) argued that deficiencies in internal control would increase information asymmetry in secondary lending markets. Sun and Yang (2013) studied the listed companies in Shanghai and found that a high quality of internal control could reduce operational accruals and improve the transparency of accounting information. Zhang (2014) argued that a higher quality of internal control could more easily gain the trust of trading partners and access to trade credit financing. Internal control could reduce the likelihood of corporate fraud and reduce information asymmetry between managers and shareholders. It allows firms to be more closely regulated to ensure that management is carried out properly and to ensure the company's value creation. The Shanghai and Shenzhen A-share listed companies' data of 2011–2012 indicate that the current Chinese internal control construction is still in the initial stages. Internal control significantly but weakly affected the value of a company. Internal control information and communication system can accurately disclosure information of the parties in a timely manner, thereby allowing trading partners to know more about the profitability and financial situation of the firms. Internal control can also enhance mutual trust and increase credit rationing. Thus, internal control quality can reduce the trade credit financing cost caused by adverse selection. Taken another way, risk identification and risk control system in internal control can effectively control and reduce operational risk. Reliability of information disclosure can also improve and reduce the financial risk of partners. Thus, lower credit compensates for information asymmetry. Sun et al. (2011) believed that internal control could improve the quality of accounting information and motivate a company to perform well in risk assessment, identification, analysis, and response.

Hypothesis1: Firms with a high quality of internal control are likely to obtain more trade credit.

2.2. Financial Development, Internal Control, and Trade Credit

The difference in regional financial development is important to the SME trade credit financing policy (Deloof and Rocca, 2015). When the financial market is imperfect, companies will be more dependent on business credit management growth. Thus, the overall conditions of the financial market are important for trade credit financing channels (Ferrando and Mulier, 2013). Economic development in different areas in China is relatively different. Financial development and credit environment are also different in certain areas. Adverse selection and moral hazard in debt contracts exist because of the information asymmetry between firms and creditors.

Existing research on trade credit financing in different financial development areas has not reached a consensus. Barclay and Smith (1995) found through empirical studies that in regions with low levels of financial development, suppliers were unable to assess the solvency of firms because of the severe information flow between firms and suppliers. Willingness to provide trade credit is reduced, and enterprises have difficulty acquiring trade credit. Demirguc-Kunt and Maksimovic (2001) also showed that a higher level of financial development in the region corresponds to increased dependence on trade credit for financing. However, Fisman (2001) argued that in areas where financial development is lagging, trade credit will be used more if firms have good prospects for growth. Ying et al. (2014) found that in areas with high levels of financial development, trade credit had a lower substitution effect on bank loans than in areas with lower levels of financial development. Cao (2007) pointed out that in areas with a low degree of financial market, companies choose trade credit for financing because of the high cost of bank credit financing. Zheng et al. (2013) found that in areas with lower marketization, a company's ability to negotiate with major suppliers is enhanced; thus, a company is more likely to obtain trade credit. However, some scholars hold the opposite view. Xiao (2008) and Cao and Kuang (2013) argued that the increased market-orientedness can help enterprises obtain more trade credit financing. Li. (2014) also pointed out that a good institutional environment can significantly reduce the cost of trade credit financing of listed companies. The cost of external financing is higher than the cost of internal financing because the capital market is not perfect. Thus, firms' external financing behavior will be constrained. Financial development will expand financial resources and products. Hence, a large number of financial liquidity and safety instruments for investors in areas with high financial development are provided. Transaction cost could be reduced, and financing channels for firms could be expanded. Hu et al. (2011) used panel data to analyze the trade credit financing of SMEs in the Guanzhong-Tianshui Economic Zone and the Pearl River Delta Economic Zone. They found that SME trade credit financing differed according to region. Jiang and Zeng (2013) found that in areas with high levels of financial development, firms were able to provide more net trade credit. Thus, obtaining bank loans is more convenient. Yano and Shiraishi (2016) found that Chinese coastal areas were more developed and active in credit financing in the form of bills and accounts payable. Trade credit was influenced by enterprises' trust and market competitiveness. For regions with a high level of financial development, the financing channels will be wider, and dependence on trade credit financing will be reduced.

The quality of internal control, which affects the quality of the financial report, will influence the information asymmetry between firms and creditors. Furthermore, the quality of internal control affects firms' performance by influencing agency conflicts and costs, thereby affecting debt risk. Many studies have found that firms with significant internal control deficiencies have worse operating performance and lower stock returns. Firms with a high quality of internal control could reduce the cost of trade credit. The relationship of high internal control quality with trade credit financing will be enhanced or weakened in districts with high financial development. Financial development is helpful in reducing information asymmetry in financial markets. Financial development provides funds for firms with high quality of information and reduces the distortion of credit allocation, thereby improving the efficiency of credit allocation. Underdeveloped districts lack financial persons, instruments, and technology innovation. Thus, firms' quality of internal control can be an effective evaluation tool that can be widely used in credit financing decisions. Therefore, the effect of the quality of internal control on trade credit financing may be more

significant in districts with lower financial development.

Hypothesis2.1: Under the same conditions, financial development has a significant effect on trade credit.

Hypothesis2.2: Under the same conditions, the influence of the quality of internal control on trade credit financing is more significant in districts with lower financial development than in districts with higher financial development.

2.3. Ownership Property, Internal Control Quality, and Trade Credit

Institutional environment can affect a firm's profit or loss in a certain manner and the firm's motivation and decision preference (North, 1991). From the perspective of ownership, the influence of quality of internal control on trade credit would be significantly different in different ownership property firms. Chinese financial market reform has made great progress, but differences in economic development still exist. The local government sometimes intervenes in financial marketing to a certain extent. The financing problem still exists in SMEs. State-owned firms are more likely to obtain financing than private firms because of their political connection. Financing cost is also relatively lower for state-owned firms. Non-state-owned firms have a limit in obtaining bank loans in China. In countries with underdeveloped financial institutions, enterprises develop mainly through informal financing channels (Ge and Qiu, 2007). Brandt and Li (2007) studied the financing of two developed Chinese provinces, namely, Jiangsu and Zhejiang, and found that banks had higher credit standards than private firms. Obtaining loans is significantly difficult for private firms. The number of loans granted to private firms is also smaller. These factors lead private banks to resort to the more costly trade credit financing. Cull and Xu (2005) found that political relationship is an important factor for Chinese state-owned bank loans. Obtaining loans from state-owned banks is more difficult for firms that lack the appropriate political relations. Hence, the influence of internal control quality on firms' trade credit financing may exist more in non-state holding firms' debt decision because non-state-owned holding firms depend more on trade credit than on bank financing. Ying and Jiang (2012) studied the data of Chinese listed SMEs and found that state-owned enterprises or enterprises with a high proportion of state ownership obtain more financing not only from banks but also from trade credit, and private enterprises need to do more on their own to obtain more financing. Ying et al. (2014) studied the data of listed companies in China from 1998 to 2009 and found that trade credit had a stronger substitution effect on bank loans for private enterprises than for non-state-owned enterprises. For private firms that obtain financing from banks, banks may pay more attention to the quality of their internal control to reduce information asymmetry. Private firms in financial difficulties have less possibility of being bailed out by the government than state-owned firms. The trade creditors will pay more attention to the debtor's quality of internal control to reduce the risk of debt financing.

Hypothesis3: The nature of property rights has a significant effect on trade credit financing.

Hypothesis3.1: When other conditions are the same, non-state-owned enterprises have more difficulty than state-owned enterprises in obtaining trade credit financing.

Hypothesis3.2: Under the same conditions, the quality of internal control of non-state-owned enterprises has a more significant effect on trade credit than that of state-owned enterprises.

3. Research Design

3.1. Sample Selection and Data Sources

This paper's sample is composed of the Shenzhen Chinese Stock Exchange GEM listed firms. The observation period is from 2011 to 2014. On this basis, we perform the following steps: First, we exclude firms' that lack financial data. Second, we exclude firms' merger and acquisition data. Third, delisted firms' data are removed from the sample. We obtained 1,064 research samples. Trade credit data use t + 1; thus, we obtained 794 groups. Another step is the standard treatment of all continuous variables in the sample. We use SPSS22.0 software to analyze the selected samples.

The listed firms' internal control index came from the Chinese Debo database, and other data came from the CSMAR and CCER databases.

3.2. Model Setting

In this paper, we set the following main models:

$$TC_{i,t+1} = a_o + a_1 IC_{i,t} + a_i Control_{i,t} + \varepsilon \quad (1)$$

$$TC_{i,t+1} = \beta_o + \beta_1 IC_{i,t} + \beta_2 FD_{i,t} + \beta_3 IC_{i,t} * FD_{i,t} + \beta_i Control_{i,t} + \varepsilon \quad (2)$$

$$TC_{i,t+1} = \chi_o + \chi_1 IC_{i,t} + \chi_2 State_{i,t} + \chi_3 IC_{i,t} * State_{i,t+} \chi_i Control_{i,t} + \varepsilon \quad (3)$$

In model 2, β_0 represents the equation intercept. β_1 and β_2 represent the internal control and endogenous variable coefficient of financial development, respectively. β_i (i = 4, 5, 6, 7, 8, 9, 10) are the control variable coefficients. ε is random, and so on for the other variables. Table 1 presents the variables and their definition.

Table 1. Variables and their definitions

Variables	Symbol	Definition
Trade credit	TC	t + 1 year accounts payable/t year total assets
Internal controls	IC	Internal Control Index of Listed Companies in China/1000
Financial development	FD	A value of 1 is assigned to a company in Shanghai, Guangdong, Zhejiang, and Jiangsu provinces; otherwise, 0.
Property rights	State	Dummy variable, according to the nature of the ultimate controller, state-owned 0, or 1
Size	Size	Natural logarithm of total assets
Growth ability	Growth	(Revenue of the current year − Revenue of the previous year)/revenue of the previous year
Mortgage ability	Capital	Fixed assets/total assets
Asset–liability ratio	Lev	Total debt/total assets
Classification of industry	Industry	Industry dummy variable
Year	Year	Annual dummy variable

4. Empirical Analysis

4.1. Descriptive Statistics

Table 2 shows the descriptive statistics results of the main variables. The minimum value of the trade credit financing scale is 0.0002, and the maximum value is 0.7966. The difference in firms' trade credit financing scale shows that the gap is larger. The minimum value of the internal control index is 0.4256, and the maximum value is 0.9215. We can see that firms' quality of internal control is uneven. Non-state-owned enterprises account for 78% of the SMEs.

Table 2. Descriptive statistics

	N	Min	Max	Mean	Sd
TC	794	0.0002	0.7966	0.1162	0.0915
IC	794	0.4256	0.9215	0.6853	0.0607
FD	794	0.0000	1.0000	0.5600	0.4970
State	794	0.0000	1.0000	0.7800	0.4160
Size	794	2.9600	3.2112	3.0706	0.0393
Growth	794	-1.0000	8.0941	0.1784	0.4456
Capital	794	0.0000	0.8846	0.2397	0.1426
Lev	794	0.0103	0.9444	0.4003	0.1977
Industry	794	0.0000	12.0000	2.9509	2.3542
Year	794	0.0000	2.0000	1.0000	0.8180

4.2. Correlation Analysis

Table 3 shows the correlation of the main variables. The correlation coefficient matrix shows that the quality of internal control of small and medium-sized board enterprises is positively correlated with trade credit financing at the 1% level (0.106***, 0.003). Financial development and trade credit financing have a significantly positive correlation at the 5% level (0.077**, 0.031). Property rights and trade credit financing have a significantly negative correlation at the 1% level (−0.160***, 0.000). The correlation coefficient analysis can reflect only the independent correlation between the two variables to obtain more realistic results. Further regression estimation is needed to verify the quality of internal control and trade credit financing, and the relationship between financial development, property rights, and the two abovementioned variables.

Table 3. Correlation matrix.

	TC	IC	FD	State	Size	Growth	Capital	Lev	Industry	Year
TC	1									
IC	.106*** (.003)	1								
FD	.077** (.031)	−.012 (.730)	1							
State	−.160*** (.000)	.093*** (.009)	.274*** (.000)	1						
Size	.188*** (.000)	.214*** (.000)	−.087** (.015)	−.134*** (.000)	1					
Growth	.095*** (.007)	.178*** (.000)	−.067* (.061)	−.081** (.023)	.152*** (.000)	1				
Capital	−.152*** (.000)	−.203*** (.000)	−.148*** (.000)	−.225*** (.000)	−.049 (.170)	−.085** (.016)	1			
Lev	.330*** (.000)	−.081** (.022)	−.046 (.198)	−.159*** (.000)	.541*** (.000)	.071** (.044)	.042 (.236)	1		
Industry	.007 (.853)	.081** (.023)	−.041 (.246)	−.159*** (.000)	.085** (.017)	.072** (.042)	−.311*** (.000)	.121*** (.001)	1	
Year	.016 (.643)	−.167*** (.000)	−.003 (.922)	−.009 (.790)	.134*** (.000)	−.124*** (.000)	.031 (.388)	.060* (.090)	.002 (.954)	1

Note:***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

4.3. Regression Analysis

Table 4 shows the regression results of the internal control quality and trade credit financing using the basic model (1). The regression results of quality of internal control and trade credit financing show that after controlling for other relevant factors, quality of internal control and trade credit financing scale have a significantly positive correlation at the 1% significance level(0.118***, T = 3.272). The result indicates that firms with a high quality of internal control obtain more trade credit financing. Thus, Hypothesis 1 is verified.

Table 4. Regression results of internal control and trade credit financing

Variable	Coefficient	t-Value
IC	0.118***	3.272
Size	−0.058	−1.392
Growth	0.052	1.545
Capital	−0.176***	−5.000
Lev	0.385***	9.514
Industry	Yes	
Year	Yes	
Cons	0.376	1.319
Adj. R^2	0.153	
F	21.418***	

Note: ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

and trade credit have a significantly positive correlation at the 1% level. The result indicates that firms with a high quality of internal control can obtain more trade credit financing. Column (2) shows that after controlling for other relevant factors, financial development has a significantly positive correlation with trade credit. Hypothesis 2.1 is verified. Column (3) shows that after controlling for other relevant factors, quality of internal control and financial development are significantly positively correlated with the level of trade credit financing. In columns (4) and (5), two groups were assigned according to the degree of financial development: FD = 0 and FD = 1. In FD = 0, the quality of internal control is significantly positively correlated with trade credit financing (0.175 ***, T = 3.178), while in FD = 1, the quality of internal control is positively correlated with trade credit financing but not significant (0.075, t = 1.556). The influence of quality of internal control on the level of trade credit is more obvious in the region with lower financial development, which proves Hypothesis 2.2. The results are similar to the conclusions of Ying (2013). (In areas with low level of financial development, trade credit has a significantly positive effect on the growth of private enterprises, and the contribution range is far greater than the overall sample.) In areas with high levels of financial development, first, enterprises can easily obtain bank credit and other financial resources and rely less on trade credit. Second, enterprises have a high degree of marketization, and suppliers and other creditors can obtain more credit information from outside sources, thereby reducing dependence on internal information.

Table 5. Regression results of internal control, financial development, and trade credit

Variable	(1) Total samples	(2) Total samples	(3) Total samples	(4) FD = 0	(5) FD = 1
IC	0.118*** 3.272		0.288*** (3.90)	0.175*** (3.178)	0.075 (1.556)
FD		0.066** (1.959)	0.123* (1.91)		
IC*FD			-0.056* (-1.75)		
Size	−0.058 (−1.392)	−0.010 (−0.239)	-0.164* (-1.82)	−0.040 (−0.587)	−0.052 (−0.963)
Growth	0.052 (1.545)	0.069** (2.036)	0.0128 (1.22)	0.070 (1.367)	0.059 (1.284)
Capital	−0.176*** (−5.000)	−0.181*** (−5.116)	-0.099*** (-4.59)	−0.177*** (−3.396)	−0.158*** (−3.241)

Lev	0.385*** (9.514)	0.352*** (8.902	0.174*** (10.15)	0.384*** (5.925)	0.400*** (7.547)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Cons	(1.319)	(0.535)	0.315 (1.15)	(0.365)	(1.035)
Adj. R^2	0.153	0.145	0.168	0.169	0.140
F	21.418***	20.266***	18.830***	11.110***	11.281***

Note: ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

To further verify Hypothesis 3, regression using model 3 is performed. Table 6 shows the results. Column (2) shows that after controlling for other factors, the nature of property rights and trade credit financing level has a significantly negative correlation at the 1% level, thereby indicating that compared with state-owned enterprises, non-state-owned enterprises have more difficulty winning the trust of suppliers, thus obtaining less trade credit. Moreover, obtaining an implicit guarantee of trade credit by the government is possible for state-owned enterprises, and they are also more likely to obtain trade credit. Hypothesis 3.1 is verified. Columns (4) and (5) show the results of group regression analysis according to different property rights. For state-owned enterprises, after controlling for other factors, the quality of internal control is significantly positive at the 5% level (0.175**, t = 2.345). For non-state-owned enterprises, after controlling for other factors, the quality of internal control is significantly positive at the 1% level (0.108***, t = 2.623). The quality of internal control has a significantly positive effect on trade credit for state-owned and non-state-owned enterprises, that is, a high quality of internal control ensures that more trade credit can be obtained. Quality of internal control and trade credit for non-state-owned enterprises are significantly positive at the 1% level. Thus, hypothesis 3.2 is verified to some degree.

Table 6. Ownership, internal control, and trade credit

Variable	(1) Total samples	(2) Total samples	(3) Total samples	(4) State = 0	(5) State = 1
IC	0.118*** (3.272)		0.375*** (3.92)	0.175** (2.345)	0.108*** (2.623)
State		−0.185*** (−5.316)	0.095 (1.30)		
IC*State			-0.059* (-1.89)		
Size	−0.058 (−1.392)	−0.031 (−0.781)	-0.227** (-2.56)	−0.137 (−1.566)	−0.035 (−0.750)
Growth	0.052 (1.545)	.051 (1.543)	0.008 (0.82)	0.025 (0.350)	0.064* (1.670)
Capital	−0.176*** (−5.000)	−0.250*** (−6.953)	-0.141*** (-6.56)	−0.333*** (−4.663)	−0.183*** (−4.423)
Lev	0.385***	0.341***	0.171*** (10.14)	0.357***	0.376***

	(9.514)	(8.743)		(4.311)	(8.280)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Cons	(1.319)	(1.297)	0.464 (1.62)	(1.537)	(0.756)
Adj. R^2	0.153	0.171	0.203	0.208	0.157
F	21.418***	24.364***	23.430***	7.594***	17.423***
N	794	794	794	177	617

Note: ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

Table 7. Quality of internal control and trade credit group regression structure

Variable	Total samples		State = 0		State = 1	
	(1)	(2)	(3)	(4)	(5)	(6)
	FD = 0	FD = 1	FD = 0	FD = 1	FD = 0	FD = 1
IC	0.175***	0.075	0.209**	0.171	0.224***	0.044
	(3.178)	(1.556)	(2.435)	(0.176)	(3.162)	(0.864)
Size	−0.040	−0.052	0.017	−0.309	−0.054	−0.008
	(−0.587)	(−0.963)	(0.142)	(−2.193**)	(−0.642)	(−0.147)
Growth	0.070	0.059	0.029	−0.073	0.031	0.103
	(1.367)	(1.284)	(0.343)	(−0.533)	(0.482)	(2.127**)
Capital	−0.177***	−0.158***	−0.394***	−0.133	−0.127*	−0.222***
	(−3.396)	(−3.241)	(−4.725)	(−0.876)	(−1.863)	(−4.233)
Lev	0.384***	0.400***	0.229**	0.397**	0.424***	0.390***
	(5.925)	(7.547)	(2.080)	(2.642)	(5.413)	(6.870)
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Cons	(0.365)	(1.035)	(−.256)	(2.201)	(0.394)	(0.343)
Adj. R^2	0.169	0.140	0.237	0.143	0.173	0.172
F	11.110***	11.281***	6.417***	2.260**	7.776***	12.569***
N	350	444	123	54	227	390

Note: ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

On the basis of further analysis of the role of financial development and the nature of property rights in the quality of internal control and trade credit, the overall samples are divided according to financial development and equity nature. Table 7 shows four sets of results. In columns (1) and (2), the overall samples are grouped according to the level of financial development, consistent with the results in Table 5. In columns (3) and (4), state-owned enterprises are divided according to the level of financial development. In the FD = 0 group, quality of internal control and trade credit have a significantly positive correlation (0.209**, t = 2.435) at the 5% level. In the FD = 1 group, the quality of internal control is positively correlated with trade credit but is not significant. In columns (4) and (5), non-state-owned enterprises are divided according to the degree of financial development. The quality of internal control and trade credit are significantly positive at the 1%

level in the FD = 0 group (0.224***, t = 3.162). In the FD = 1 group, quality of internal control is positively correlated with trade credit but is not significant (0.044, t = 0.864). The results in Tables 5 and 6 are validated.

4.4. Robustness test

Firstly, considering the abnormal fluctuation caused by heteroscedasticity, T values all of above were adjusted by heteroscedasticity test. This is the Stock and Watson (2011) recommended practice.

Secondly, We lagged trade credit financing methods. In addition, we chosen ICt-1 as the instrumental variable, whether OLS or instrumental variable, we use the Housman test and DWH test to endogeneity of explanatory variables IC. In basic model 2, Hausman test p=0.9419, DWH test p=0.9420, which show the original hypothesis that all the explanatory variables are exogenous. In basic model 3, Hausman test p=0.4948, DWH test p=0.4953, which explains the original hypothesis that all explanatory variables are exogenous.

Thirdly, to enhance the robustness of the empirical results, this paper attempted to replace trade credit, quality of internal control, and financial development. We found that the results of the regression of the basic form have not changed. We adopted (payables + advance receipts)/total assets as a substitute for trade credit financing for the robustness test and found that the results remained consistent with those of the previous test.

Table 8. Robustness test results of internal control, financial development, and trade credit

	(1)	(2)	(3)
IC	0.320***		0.478***
	(4.59)		(4.81)
FD		0.0028	0.196*
		(0.37)	(2.26)
IC*FD			-0.0967*
			(-2.23)
	(-0.11)	(0.59)	(-0.09)
Capital	-0.217***	-0.235***	-0.217***
	(-7.61)	(-8.08)	(-7.50)
Lev	0.259***	0.232***	0.259***
	(11.20)	(10.24)	(11.24)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Cons	-0.483	-0.784*	-0.694
	(-1.36)	(-2.21)	(-1.89)
Adj. R2	0.2911	0.2723 6	0.1683
F	47.53***	43.39***	18.83***
N	794	794	794

Note: ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

Table 9. Robustness test results of Ownership, internal control, and trade credit

	(1)	(2)	(3)
IC	0.320***		0.591***
	(4.59)		(4.60)
State		-0.0526***	0.155
		(-5.59)	(1.58)
IC*State			-0.0907*

			(-2.16)
Size	0.114	0.231*	0.0437
	(0.94)	(2.01)	(0.37)
Growth	-0.0016	0.0059	-0.0056
	(-0.11)	(0.42)	(-0.41)
Capital	-0.217***	-0.284***	-0.266***
	(-7.61)	(-9.70)	(-9.18)
Lev	0.259***	0.225***	0.253***
	(11.20)	(10.09)	(11.24)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Cons	-0.483	-0.542	-0.549
	(-1.36)	(-1.55)	(-1.43)
Adj. R2	0.2974	0.3000	0.3332
F-value	47.53***	49.54***	43.53***
N	794	794	794

Note: ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

Additional, financial development as FD was replaced by Process of Marketization in the province where the enterprise is located by Gang Fan (2011). The conclusions of this paper remain unchanged.

Table 10 . Robustness test results financial development's regulating effect

	(1)	(2)	(3)
IC	0.320***		0.748**
	(4.59)		(2.97)
FD		0.0009	0.0439*
		(0.42)	(2.29)
IC*FD			-0.0820*
			(-2.25)
	(-0.11)	(0.58)	(1.11)
Capital	-0.217***	-0.234***	-0.104***
	(-7.61)	(-7.98)	(-4.80)
Lev	0.259***	0.233***	0.176***
	(11.20)	(10.26)	(10.23)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Cons	-0.483	-0.793*	-0.291
	(-1.36)	(-2.22)	(-0.68)
Adj. R2	0.2911	0.2723	0.1669
F	47.53***	43.39***	18.65***
N	794	794	794

Note: ***Significant at the 1% level, **significant at the 5% level, *significant at the 10% level.

5. Conclusions

From the perspective of trade credit financing, this paper analyzes the economic consequences of information disclosure of internal control of listed companies in China by examining the effect of financial environment, internal control quality, and trade credit financing. On the basis of our understanding of the existing literature, the possible contributions of this paper are as follows: First, this paper introduces financial environment, internal control quality, and trade credit financing into the research framework. The introduction provides a feasible means to further understand the influence of factors of trade credit financing and the inherent relationship between the three. Our research, which discusses the important influence of internal information system (internal control quality) and external mechanism (financial environment) on enterprises' trade credit financing, provides a new perspective. Second, our research is helpful in evaluating the economic consequences of disclosing the internal control information of listed companies in China. Third, research on the influencing factors of trade credit financing is enriched, thereby providing references for solving the financing problems of SMEs.

The results of this study show that financial environment and quality of internal control significantly affect users of financial reports (creditors). Under different external mechanisms, the influence of quality of internal control on trade credit financing is different. Quality of internal control has a different influence on trade credit financing in different financial development areas. The implication of this paper is that the improvement of the trade credit financing environment requires the facilitating role of internal and external information mechanisms. Through continuous improvement of the internal control system and the internal control information disclosure system, the information environment of listed companies can be optimized, thereby strengthening the protection of investors and creditors. Speeding up the process of marketization and improving the financial environment are effective means to optimize the information environment, which will help enrich enterprise financing and address the financing dilemma of SMEs.

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