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Capital market liberalization and corporate debt maturity structure: evidence from the Shanghai-Shenzhen-Hong Kong Stock connect

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Abstract

Purpose – This paper takes the Shanghai-Shenzhen-Hong Kong Stock Connect as a quasi-natural experiment and investigates the impact of capital market liberalization on the corporate debt maturity structure. It also aims to provide some policy implications for corporate debt financing and further liberalization of the capital market in China.

Design/methodology/approach – Employing the exogenous event of Shanghai-Shenzhen-Hong Kong Stock Connect and using the data of Chinese A-share firms from 2010 to 2020, this study constructs a difference-in-differences model to examine the relationship between capital market liberalization and corporate debt maturity structure. To validate the results, this study performed several robustness tests, including the parallel test, the placebo test, the Heckman two-stage regression and the propensity score matching.

Findings – This paper finds that capital market liberalization has significantly increased the proportion of long-term debt of target firms. Further analyses suggest that the impact of capital market liberalization on the debt maturity structure is more pronounced for firms with lower management ownership and non-Big 4 audit. Channel tests show that capital market liberalization improves firms' information environment and curbs self-interested management behavior.

Originality/value – This research provides empirical evidence for the consequences of capital market liberalization and enriches the literature on the determinants of corporate debt maturity structure. Further this study makes a reference for regulators and financial institutions to improve corporate financing through the governance role of capital market liberalization.

Keywords Capital market liberalization, Information environment, Self-interested management behavior, Corporate debt maturity structure

Paper type Research paper

JEL Classification — G32, D53

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1. Introduction

In the 1970s, developed countries began opening their capital markets, which accelerated the process of economic globalization by introducing international capital. By the 1980s, developing countries also liberalized their capital markets. China's capital market has gradually opened since 2002. The programs of Qualified Foreign Institutional Investor (QFII), Qualified Domestic Institutional Investor (QDII) and Renminbi Qualified Foreign International Investor (RQFII) have been adopted sequentially. The Shanghai-Hong Kong Stock Connect (SHHC) was launched in 2014. Linking the Shanghai Stock Exchange and the Hong Kong Stock Exchange allows investors from both markets to trade stocks in the counterpart exchanges. This policy achieved the two-way opening of the Chinese capital market. The Shenzhen-Hong Kong Stock Connect (SZHC) was subsequently established in 2016. As a milestone in the internationalization of the Chinese capital market, the SHHC and SZHC aim to promote interconnections between the mainland and Hong Kong capital markets.

The extant literature has provided some evidence of the impact of capital market liberalization on firm operation and stock market. Capital market liberalization, as an important external governance mechanism, can strengthen the effectiveness of corporate governance. For example, it enhances the liquidity of stock market (Li, Liu, Chen, & Wang, 2022; Li, Chen, Lian, & Li, 2022) increases the information content of stock prices (Ji & Zang, 2019; Ren, Guo, & Tian, 2021), restrains insider selling by corporate managers (Qi & Sun, 2023), constrains earnings management (Ma & Wang, 2021; Jiang, Zhang, & Mu, 2022), and improves internal control quality (Tian, Xu, & Tian, 2021). However, whether capital market liberalization affects the corporate debt maturity structure has not yet been examined.

Debt financing is an important financing channel in China (Allen, Qian, & Qian, 2005). According to statistics from the People's Bank of China, debt financing accounted for 87.65% of the total financing of firms in 2020, including 75.3% bank loans and 12.35% corporate bonds. However, in China's economic transition, its legal system is not mature and its financial market is not well developed, which has exacerbated financing problems for firms (Tan & Shao, 2021). The cost-benefit trade-off makes banks unwilling to provide long-term loans to firms to avoid risk. As a result, firms must use short-term loans to support long-term investments, leading to a short debt maturity structure (Ling, Li, & Pan, 2023; Liu, Wang, & Dai, 2023). Short debt maturity may increase firms' financial risk, endanger the financial system's stability, and hinder the high-quality development of the economy (Wang, Wang, & Xu, 2022; Li, Liu *et al.*, 2022; Li, Chen *et al.*, 2022). Thus, extending the corporate debt maturity structure has become an essential issue in both academic research and economic practice.

China's capital market liberalization, represented by the Shanghai-Shenzhen-Hong Kong Stock Connect (SHZHC), as an important external governance mechanism, has brought in more experienced foreign investors and analysts. It can not only improve firms' information environment but also become a new force to curb self-interested management behavior, which may increase creditors' confidence. Thus, creditors are willing to provide long-term loans to firms. Can capital market liberalization affect the corporate debt maturity structure? What is the impact? How does it vary for different firms? What are the influencing mechanisms? The answers to these questions can help us understand the role of capital market liberalization in firms' debt financing and provide a reference for further opening the capital market in China.

The SHZHC has operated smoothly since it was launched. By selecting a number of stocks as pilots, the SHZHC provides a natural experiment to test the consequences of capital market liberalization. Employing Chinese A-share firms from 2010 to 2020 as samples, we construct a difference-in-differences model to examine the impact of capital market liberalization on the corporate debt maturity structure. We find that the SHZHC increases the proportion of long-term debt of target firms. Furthermore, the effect of capital market liberalization on the corporate debt maturity structure is more significant for firms with lower management

ownership and non-Big 4 audit. Channel analyses reveal that the SHZHC extends the corporate debt maturity structure by improving firms' information environment and curbing self-interested management behavior.

This study makes several contributions to the literature. First, we provide empirical evidence for the consequences of capital market liberalization by examining the corporate debt maturity structure. The literature has explored the influence of the SHZHC. For example, studies find that the SHZHC enhances the information content of stock prices (Zhong & Lu, 2018), lowers firm risk-taking behavior (Wu, Zhou, & Li, 2022; Wu, Huang, & Du, 2022), restrains insider trading (Wan, Zhu, & Yu, 2022), improves firms' investment efficiency (Liu & Wang, 2019), and encourages private disclosure by firms (Yoon, 2021). However, no studies have investigated the impact of the SHZHC on the debt maturity structure.

Second, our research enriches the literature on the determinants of corporate debt maturity structure. Various factors of corporate debt maturity structure, such as financial market development, industry characteristics, corporate governance, and executive personality, have been studied (Datta, Iskandar-Datta, & Raman, 2005; Erhemjamts, Raman, & Shahrur, 2010; Stephan, Talavera, & Tsapin, 2011; Kirch & Terra, 2012; Huang, Tan, & Faff, 2016; Freund, Kovacs, Nguyen, & Phan, 2023; Gao, Jiang, & Jin, 2023). This paper aims to research the determinants of the corporate debt maturity structure from the perspective of capital market liberalization.

Third, our findings have some implications for improving the corporate debt maturity structure of firms and further liberalizing the Chinese capital market. The SHZHC has attracted a substantial number of foreign investors, improved the information quality of firms, and discouraged self-interested management behavior, all generating positive effects. In addition to providing evidence for further capital market liberalization, this study provides a reference for regulators and financial institutions to improve corporate financing through the governance role of capital market liberalization.

The remainder of this paper is structured as follows. Section 2 introduces the institutional background and reviews the literature. Section 3 develops the hypotheses. Section 4 describes the sample, the regression model, and variables. The empirical results are reported in Section 5, with additional analyses presented in Section 6. Finally, we conclude in Section 7.

2. Institutional background and literature review

2.1 Institutional background

The Chinese capital market has gradually opened since 2002. The programs of QFII, QDII and RQFII were adopted sequentially from 2002 to 2011. Afterward, the China Securities Regulatory Commission (CSRC) sped up capital market liberalization. The SHHC was approved by the CSRC on April 10, 2014. The first trade of the SHHC was launched on November 17, 2014. Initially, there were a total of 568 tradable stocks in the Shanghai Stock Exchange, including stocks of the SSE 180 Index, the SSE 380 Index, and companies listed on both the Shanghai and the Hong Kong Stock Exchanges. After the successful pilot of the SHHC, the CSRC announced the launch of the SZHC on December 5, 2016. The initial 882 tradable stocks in the Shenzhen Stock Exchange included stocks of the SZSE Component Index, the SZSE SME Innovation Index, and companies listed on both the Shenzhen and the Hong Kong Stock Exchanges.

The SHZHC is an interconnection mechanism for trading stocks between the Shanghai, Shenzhen and Hong Kong stock markets. It allows investors from mainland China and Hong Kong to buy or sell stocks of companies listed on counterpart exchanges. Appendix 1 presents the annual trading volume of the SHZHC from 2014 to 2020, showing a significant increase in trading volume since 2014 [1]. As a milestone in the internationalization of the Chinese capital market, the SHZHC has greatly stimulated the investment of overseas investors in the Chinese stock exchanges, propelling the Chinese capital market toward a new stage of opening in two directions.

2.2 Literature review

2.2.1 Corporate debt maturity structure. The debt maturity structure is a compromise between managers, shareholders and creditors. As an important corporate financing decision, debt maturity structure is a hot topic in academic research.

From the macro perspective, Fan, Titman, and Twite (2012) employ data from 39 countries and document that banks are more likely to provide short-term loans to firms when government intervention is more severe and legal protection is poorer. Aarstol (2000) argues that the inflation rate is negatively correlated with the proportion of long-term debt. González and González (2014) find that bank liberalization increases debt availability, resulting in a longer debt maturity structure. Kirch and Terra (2012) examine the effect of country-level financial development on the corporate debt maturity structure. Stephan *et al.* (2011) explore the determinants of liability maturity choice in emerging markets. Erhemjamts *et al.* (2010) find that fierce industry competition reduces firms' short-term debt.

From the micro perspective, Ahmadi and Gerayli (2018) find that high-quality auditors can reduce agency costs and improve the debt maturity structure. Datta *et al.* (2005) show that management shareholding is negatively correlated with firms' long-term debt. Barclay and Smith (1995) confirm that firms facing more regulation have a greater proportion of long-term debt. Gao *et al.* (2023) suggest that corporate debt maturity increases with insiders' disproportional control rights. Freund *et al.* (2023) indicate that CEOs with sensation-seeking personality prefer long-term debt financing to avoid liquidity risk. Furthermore, the literature shows that voluntary disclosure, cash flow volatility, corporate tax rate and asset maturity affect the debt maturity structure (Ozkan, 2000; Keefe & Yaghoubi, 2016; Pour & Lasfer, 2019; Allaya, Derouiche, & Muessig, 2022).

The literature explores the debt maturity structure of Chinese firms. Owing to the underdeveloped capital market and the dominance of the bank system, Chinese firms have a short debt maturity structure (Bai, Qiu, & Li, 2016). Ye, Li, and Tao (2022) provide evidence that financial institutions prefer to provide short-term debt to avoid high information search costs and subsequent default risks. Examining tax-cutting policies, Zhou, Shen, and Liu (2022) suggest that an increase in corporate earnings positively impacts creditor confidence, effectively extending the corporate debt maturity structure. Zhang, Cai, and Wu (2016) find that the proportion of short-term debt is higher under looser monetary policies. In addition, cooperation between the government and firms is related to the corporate debt maturity structure (Huang & Wu, 2014; Wu, Liu, & Zhong, 2020).

In summary, the extant literature has explored the determinants of corporate debt maturity structure, such as financial market development, industry characteristics, corporate governance and executive personality. However, no research has investigated the role of capital market liberalization. This paper examines the impact of capital market liberalization on the corporate debt maturity structure by employing the SHZHC as an exogenous shock.

2.2.2 Capital market liberalization. The SHZHC has attracted more foreign investors with higher information requirements, more professional knowledge and better information processing ability. Their participation in corporate governance can play a monitoring role, which alleviates agency problems for firms. The literature has studied the consequences of capital market liberalization.

First, capital market liberalization improves stock liquidity (Liu, Wang, & Wei, 2021), which positively affects the development of capital markets. Li, Liu, *et al.* (2022) and Li, Chen *et al.* (2022) claim that the SHHC has significantly reduced the stock price synchronicity of target firms. Li and Xu (2019) prove that capital market liberalization decreases stock price crash risk because of lower information asymmetry and less noise trading. Zhong, Sun, and Wang (2018) confirm that the SHHC not only strengthens the governance role of foreign investors but also forces firms to improve information disclosure quality, which reduces stock price fluctuations. Zhong and Lu (2018) argue that capital market liberalization helps incorporate firm-specific information into stock prices through informed trading and enhances the information content of stock prices. However, other studies have shown that the

interconnection of the mainland and overseas capital markets under the SHHC has increased the risk to the mainland stock market (Huo & Ahmed, 2017). In the short term, the SHHC increases the volatility of stock prices, resulting in a reduction of liquidity in the mainland stock market (Xu & Chen, 2016). International capital also threatens the development of the Chinese capital market (Li & Li, 2017).

Second, using China's capital market liberalization as a shock, Yoon (2021) finds that firms with the need for capital are more likely to host private disclosure activities. Deng, Hope, Wang, and Zhang (2022) show that the SHHC introduces greater reputation and litigation risks to auditors, which affects auditors' professional judgment and audit adjustment. Peng, Zhang, and Chen (2021) reveal that capital market liberalization significantly increases corporate investment efficiency by improving information disclosure and corporate governance. Moreover, the SHZHC deters insider trading by managers (Liu *et al.*, 2023), alleviates financing constraints (Chen, Zhang, & Dong, 2012), and improves the quality of internal control (Tian *et al.*, 2021).

The extant literature has provided some evidence of the positive role of capital market liberalization in firm operation. However, whether capital market liberalization affects the corporate debt maturity structure has not yet been examined. Therefore, employing the quasi-natural experiment of the SHZHC, this paper investigates the economic consequences of capital market liberalization from the perspective of the corporate debt maturity structure.

3. Hypothesis development

Owing to the underdevelopment of the legal system in China, firm managers may infringe on creditors' interests through their information advantage (Huang & Song, 2006; Fan *et al.*, 2012). Thus, creditors prefer to provide short-term loans to alleviate agency problems and reduce credit risk. As a result, Chinese firms have a short debt maturity structure, resulting in a mismatch between assets and debts, which in turn creates liquidity problems, increases financial risk, and negatively impacts firms' long-term investment and sustainable development (Bai *et al.*, 2016; Wang *et al.*, 2022; Li, Liu, *et al.*, 2022; Li, Chen *et al.*, 2022). Our study examines how capital market liberalization influences the corporate debt maturity structure.

Since establishing the SHZHC, the mainland capital market has attracted more foreign investors with better information search and data analysis capabilities (Bae, Chan, & Ng, 2004; Lian, Zhu, & Chen, 2019; Li, Xu, Si, & Lv, 2021). These foreign investors demand greater information disclosure, tolerate less fraud and violation, and more actively protect their interests through litigation, which may promote target firms to improve information disclosure and curb self-interested management behavior. Under the monitoring of foreign investors, firms may adopt high-quality accounting policies. It also increases firms' voluntary information disclosure by issuing more accurate earnings forecasts, which enhances information transparency and improves the overall information environment of target firms (Sun, Sun, & Dong, 2022). When the firm's information transparency is high, it is difficult for insiders to conceal the firm's operating conditions from outsiders, which helps alleviate information asymmetry, reduce agency costs and increase creditors' confidence, enabling firms to obtain more long-term debt (Leland, 1998; Gopalan & Jayaraman, 2012).

Furthermore, the SHZHC has led to strict information disclosure regulations. The Shanghai and Shenzhen Stock Exchanges issue regulations on information disclosure after the SHZHC, which further improves the information disclosure of target firms. Moreover, more overseas analysts have begun following A-share firms, particularly target firms, after capital market liberalization (Li *et al.*, 2021). The coverage of overseas analysts can improve the firm information environment and play a monitoring role in firm behavior (Du, 2021). Thus, creditors are more likely to provide long-term debt to target firms after the SHZHC.

Also, investors from mature markets are more proactive in defending their rights. When they find out that management is hiding bad news or engaging in misconduct, they are more

inclined to protect their interests through legal proceedings (Fernandes, Lel, & Miller, 2010). In addition, foreign investors can use market transactions to exert pressure on management by selling shares (Lian *et al.*, 2019). Driven by the motivation to maintain share prices and avoid dismissal, management will constrain behaviors that harm corporate value. As the target company is subject to stricter supervision and discipline by foreign investors, the risk of management self-interest and misconduct may be reduced. The supervisory environment is likely to form a discipline effect on managers, which encourages them to perform their duties diligently and reduces self-interested behaviors (Zhong *et al.*, 2018; Li & Xu, 2019). Thus, capital market openness can be effective in protecting the interests of creditors and preserving the security of credit capital, increasing the confidence and willingness of creditors to provide long-term loans to firms.

In summary, we argue that capital market liberalization can increase the corporate debt maturity structure by improving information disclosure and curbing self-interested management behavior. Thus, we propose the following hypothesis.

H1-a. The SHZHC lengthens the debt maturity structure of target firms.

Although the SHZHC might have positive effects on firms' corporate governance by introducing foreign investors, it may be a double-edged sword. After capital market liberalization, the mainland capital market faces more serious threats of risk contagion (Giannetti, 2007). For example, Xu and Chen (2016) find that the SHZHC increases the stock price volatility of target firms. Huo and Ahmed (2017) document the increased overall risk of the mainland stock market after the SHZHC. Furthermore, the shocks from overseas markets can adversely affect target firms after the SHZHC, which may increase their financial risk (Tian *et al.*, 2021). Short-term loans, which must be repaid in a timely manner or renewed frequently, play a governance role in credit contracts. Thus, risk-averse creditors are more inclined to provide short-term debt to firms to control credit risk after the SHZHC, which might shorten the corporate debt maturity structure (Stulz, 1999). Based on this argument, we propose the following alternative hypothesis.

H1-b. The SHZHC shortens the debt maturity structure of target firms.

4. Research design

4.1 Sample and data

Our research employs Chinese A-share listed firms from 2010 to 2020 as samples. We exclude firms in the financial industry and ST/*ST firms. We drop companies issuing B shares or H shares. In addition, we exclude companies that have been removed from the SHZHC list during the sample period. The sample also drops companies with abnormal financial data (equity less than 0 and leverage greater than 1) or missing variables in the regression. Finally, we obtain 10,351 firm-year observations.

Our data are retrieved from the China Stock Market and Accounting Research database. To eliminate the effect of outliers, we winsorize the continuous variables at the 1st and 99th percentiles.

4.2 Variable definition

The study employs corporate debt maturity (*DM*) as the dependent variable. Following the literature (Wu *et al.*, 2020; Ye *et al.*, 2022), it is calculated as the proportion of long-term debt to total debt.

We employ capital market liberalization (*Open*) as the independent variable. We include both the SHHC and SZHC in our study to comprehensively examine the impact of capital market liberalization on the corporate debt maturity structure. Based on the multiple inclusions of target firms under the SHZHC, we construct the dummy variable *Open*, which indicates

whether the firm enters the trading list of the SHZHC. *Open* takes a value of one if the firm enters the trading list of the SHZHC and zero otherwise.

4.3 Regression model

Following Bertrand and Mullainathan (2003), Ma and Wang (2021), and Wu, Zhou *et al.* (2022) and Wu, Huang *et al*. (2022), we construct the following difference-in-differences model:

$$DM_{i,t} = \beta_0 + \beta_1 Open_{i,t} + \sum Controls + \sum Firm + \sum Year + \delta_{i,t} \quad (1)$$

where i represents the firm, t represents the year, $\sum Firm$ indicates firm fixed effects, and $\sum Year$ indicates year fixed effects. *Open* denotes whether the firm enters the trading list of SHZHC in year *t*. If the coefficient on *Open* is significantly positive, Hypothesis 1-a proves that capital market liberalization increases the proportion of long-term debt and extends the corporate debt maturity structure. Conversely, if the coefficient of *Open* is significantly negative, Hypothesis 1-b is valid in that capital market liberalization decreases the proportion of long-term debt and shortens the corporate debt maturity structure.

Referring to the literature (Wu *et al*., 2020; Du, 2021; Zhou *et al*., 2022), the regression includes some control variables, such as firm size, return on assets, growth, leverage, asset duration, cash flows, large shareholder shareholding, duality of chairperson and CEO, and QFII ownership. The definitions of variables are presented in Appendix 2.

5. Empirical results

5.1 Descriptive statistics

Table 1 reports the descriptive statistics of variables. The mean value of *DM* is 0.3775, indicating that, on average, Chinese firms have a short debt maturity structure. Moreover, the maximum value of *DM* is 1.00, and the minimum value is 0.00, suggesting a significant difference in the debt maturity structure of sample firms. The mean value of *Open* reveals that 4.48% of observations are affected by the SHZHC.

The mean value of firm size (*Size*) is 22.3708, and the mean value of return on assets (*ROA*) is 0.0342. The average growth rate (*Growth*) is 0.2126. On average, liabilities account for 51.79% of total assets. The mean value of asset duration (*AM*) is 0.2478, and the mean value of cash flows (*CFO*) is 0.0365. The average ownership of the largest shareholder is 35.50%, and the average QFII ownership is 0.08%. Finally, 22.44% of firms have the duality structure of chairperson and CEO.

Table 1. Summary statistics

Variable	Obs.	Mean	Median	Std. Dev.	Min	Max
DM	10,351	0.3775	0.3196	0.3466	0.0000	1.0000
Open	10,351	0.0448	0.0000	0.2069	0.0000	1.0000
Size	10,351	22.3708	22.1946	1.3652	19.6255	26.3050
ROA	10,351	0.0342	0.0309	0.0542	−0.1857	0.1949
Growth	10,351	0.2126	0.1123	0.5837	−0.5672	4.3304
Lev	10,351	0.5179	0.5195	0.1999	0.1051	0.9934
AM	10,351	0.2478	0.2172	0.1806	0.0016	0.7499
CFO	10,351	0.0365	0.0380	0.0710	−0.1952	0.2223
Top1	10,351	0.3550	0.3335	0.1532	0.0863	0.7613
Dual	10,351	0.2244	0.0000	0.4172	0.0000	1.0000
QFII	10,351	0.0008	0.0000	0.0035	0.0000	0.0235

Note(s): This table presents the summary statistics of variables. Variable definitions are available in Appendix 2
Source(s): Table by authors

Table 2. Correlation matrix

Variable	DM	Open	Size	ROA	Growth	Lev	AM	CFO	Top1	Dual	QFII
DM	1.000										
Open	0.108***	1.000									
Size	0.452***	0.195***	1.000								
ROA	0.016	0.074***	0.030***	1.000							
Growth	0.015	0.016	0.030***	0.244***	1.000						
Lev	0.212***	0.020**	0.414***	−0.397***	0.026***	1.000					
AM	0.022**	−0.028***	0.003	−0.129***	−0.072***	0.007	1.000				
CFO	0.057***	0.070***	0.059***	0.307***	0.007	−0.158***	0.292***	1.000			
Top1	0.124***	0.006	0.261***	0.107***	0.039***	0.057***	0.064***	0.061***	1.000		
Dual	−0.082***	0.071***	−0.104***	0.022**	0.016	−0.078***	−0.077***	−0.027***	−0.055***	1.000	
QFII	0.029***	0.067***	0.077***	0.103***	0.001	−0.023**	0.007	0.097***	−0.002	0.002	1.000

Note(s): This table presents the correlation matrix of variables. Variable definitions are available in Appendix 2. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively
Source(s): Table by authors

Table 3. Capital market liberalization and corporate debt maturity structure

Variable	DM (1)	(2)
Open	0.0953***	0.0631***
	(4.46)	(2.95)
Size		0.0893***
		(8.77)
ROA		−0.0210
		(−0.24)
Growth		−0.0087**
		(−2.05)
Lev		0.0760*
		(1.92)
AM		0.0176
		(0.35)
CFO		0.1546***
		(3.63)
Top1		0.0015***
		(2.64)
Dual		−0.0111
		(−1.14)
QFII		−0.0257
		(−0.03)
Constant	0.3399***	−1.7060***
	(48.41)	(−7.73)
Firm FE	Control	Control
Year FE	Control	Control
R^2	0.1001	0.2180
N	10,351	10,351

Note(s): This table presents the regression results of the impact of capital market liberation on the corporate debt maturity structure. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively
Source(s): Table by authors

Table 2 provides the correlation matrix of variables. It shows that the correlation between capital market liberalization and corporate debt maturity is positive and significant at the 1% level, lending the initial support to Hypothesis 1-a. The evidence implies that the SHZHC increases the proportion of long-term debt for target firms and extends their corporate debt

Table 4. Parallel trend test

Variable	DM
Pre3	−0.0057
	(−0.35)
Pre2	0.0042
	(0.28)
Post0	0.0502*
	(1.95)
Post1	0.0610***
	(2.71)
Post2	0.0503**
	(2.15)
Size	0.0904***
	(8.96)
ROA	−0.0216
	(−0.24)
Growth	−0.0089**
	(−2.09)
Lev	0.0774*
	(1.96)
AM	0.0192
	(0.39)
CFO	0.1585***
	(3.72)
Top1	0.0014**
	(2.45)
Dual	−0.0110
	(−1.14)
QFII	0.0085
	(0.01)
Constant	−1.7278***
	(−7.88)
Firm FE	Control
Year FE	Control
R^2	0.2213
N	10,351

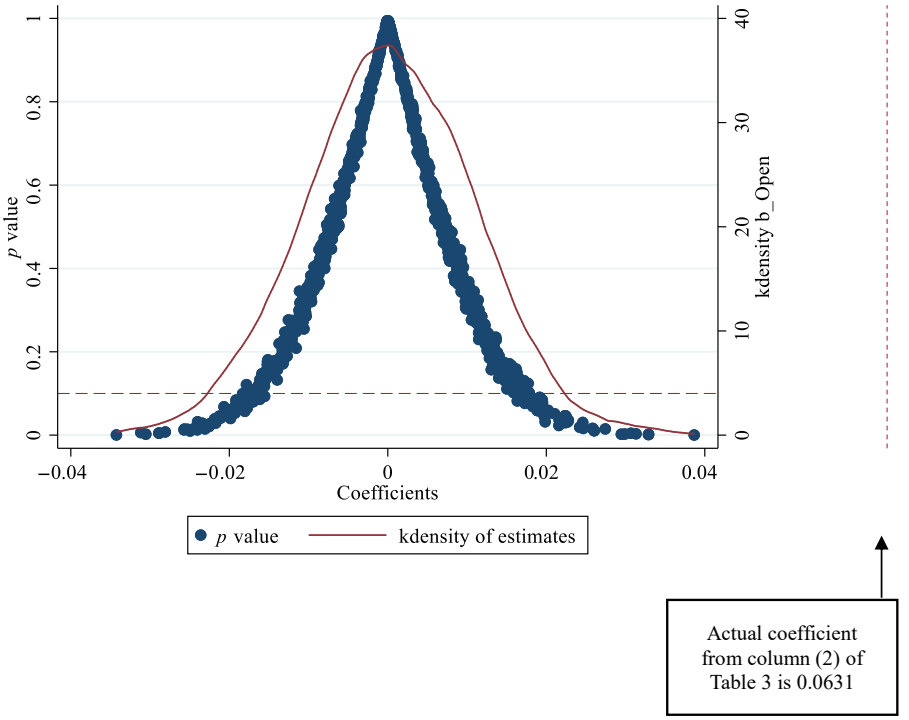
Note(s): This table presents the regression results of parallel trend test. We employ the first year before firms entering the trading list of the SHZHC as the benchmark. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Table by authors

maturity structure. In addition, the correlations between independent variables are less than 0.5, suggesting minimal multicollinearity concerns.

5.2 Baseline regression

Table 3 reports the regression results of Model (1). In Column (1), the coefficient of *Open* is 0.0953 and significant at the 1% level, indicating that the SHZHC increases the proportion of long-term debt of target firms. We further include control variables in Column (2), and the coefficient on *Open* is 0.0631 and significant at the 1% level. The results verify the positive effect of capital market liberalization on the corporate debt maturity structure. The impact is also economically significant. Compared with nontarget firms, the SHZHC generates a 6.31% increase in the proportion of long-term debt for target firms.



Note(s): This figure presents the kernel density estimates of coefficients and *P* values of Open based on 1000 simulation regressions

Source(s): Figure by authors

Figure 1. Placebo test

Table 5. Goodman-Bacon decomposition

DD comparison	Avg DD estimate	Weight
Earlier treatment vs latter comparison	−0.024	0.011
Latter treatment vs earlier comparison	0.099	0.007
Treatment vs never treated	0.097	0.971
Treatment vs already treated	−0.089	0.011

Note(s): This table presents the results of the Goodman-Bacon decomposition. The average difference-in-differences estimation of *Open* is 0.094

Source(s): Table by authors

Regarding control variables, there is a positive relationship between firm size and debt maturity structure. The growth rate has a significantly negative effect on corporate debt maturity. The higher a firm's financial leverage is, the greater the proportion of long-term debt. The coefficient of cash flows is positive and significant, implying that creditors are more likely to provide long-term loans to firms with more cash flows. Finally, the largest shareholder ownership is positively correlated with corporate debt maturity.

5.3 Robustness analyses

5.3.1 Parallel trend test. A prerequisite for the difference-in-differences model is to meet the parallel trend assumption. That is, the treatment and control firms have similar trends of the debt maturity structure before the SHZHC. Following Bertrand and Mullainathan (1999) and Mao, Li, and Jin (2021), we use the first year before firms enter the trading list of the SHZHC as the benchmark and construct several indicator variables. *Pre2* and *Pre3* indicate two years and three years before firms enter the trading list of the SHZHC, respectively. Meanwhile, *Post0*, *Post1* and *Post2* indicate the current year, the first year, and the second or more years after firms enter the trading list of the SHZHC, respectively.

Table 6. Heckman two-stage regression

Variable	(1) Open	(2) DM
Dfn	0.6207***	
	(5.54)	
Open		0.0586**
		(2.45)
IMR		0.0527**
		(2.27)
Size	0.0825*	0.0963***
	(1.76)	(8.27)
ROA	5.0524***	0.2828*
	(5.13)	(1.86)
Growth	−0.0849	−0.0148**
	(−1.48)	(−1.98)
CFO	1.3855**	0.2090***
	(2.26)	(3.09)
Top1	0.0012	0.0014**
	(0.32)	(2.15)
Dual	0.1563	0.0015
	(1.41)	(0.11)
QFII		1.0872
		(0.91)
Lev		0.0194
		(0.38)
AM		−0.0059
		(−0.09)
Big4	0.4119*	
	(1.95)	
Mshr	0.0086***	
	(4.24)	
Turnover	0.1871	
	(1.63)	
Constant	−8.9567***	−2.1737***
	(−8.49)	(−6.67)
Firm FE	Control	Control
Year FE	Control	Control
R^2	0.3212	0.2259
N	6,198	6,198

Note(s): This table presents the regression results of the Heckman two-stage regression. Variable definitions are available in Appendix 2. The dummy variable *Dfn* indicates whether the firm has overseas branches. The inverse Mills ratio (IMR) is estimated from the first stage regression. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Table by authors

Table 4 reports the regression results. The coefficients of *Pre3* and *Pre2* are insignificant, suggesting that there is no significant difference in debt maturity structure between the treatment and control firms before the SHZHC. In contrast, the coefficients of *Post0*, *Post1* and *Post2* are significantly positive, indicating that the debt maturity of treatment firms increases significantly compared with that of control firms after the SHZHC. The results are consistent with the parallel trend assumption, further supporting our conclusion.

5.3.2 Placebo test. To address the issue that the increase in corporate debt maturity may be caused by other events, we perform a placebo test. Specifically, we follow Li, Lu, and Wang (2016) and randomly assign the treatment status to firms. It artificially specifies whether firms are designated SHZHC target companies and the years when they enter the list of SHZHC. Based on 1,000 regressions conducted on randomly manipulated samples, the coefficients and P values of *Open* are presented in Figure 1.

The coefficients obtained from random simulation regressions are significantly different from the true value of *Open* (0.0631) reported in Table 3. Moreover, the *p*-values for most of the estimated coefficients are above 0.1. Generally, the results reaffirm our conclusions.

5.3.3 Goodman–Bacon decomposition. The literature has discussed the bias in estimating the multiperiod difference-in-differences model (Baker, Larcker, & Wang, 2022). According to Goodman-Bacon (2021), the estimate of two-way fixed effects equals the weighted average of all possible two-period difference-in-differences estimates. However, treatment effects in two-way fixed effects regressions typically exhibit heterogeneity across different treatment groups or different treatment periods, which may lead to incorrect estimation owing to heterogeneous treatment effects. Therefore, we refer to the method of Goodman-Bacon (2021) to examine the extent of bias in the multiperiod difference-in-differences model. We decompose the estimate of two-way fixed effects into several 2×2 difference-in-differences combinations and then assess the severity of heterogeneity in treatment effects. To ensure that the decomposition is effective, we do not include covariates.

Table 7. PSM balance test of matching variables

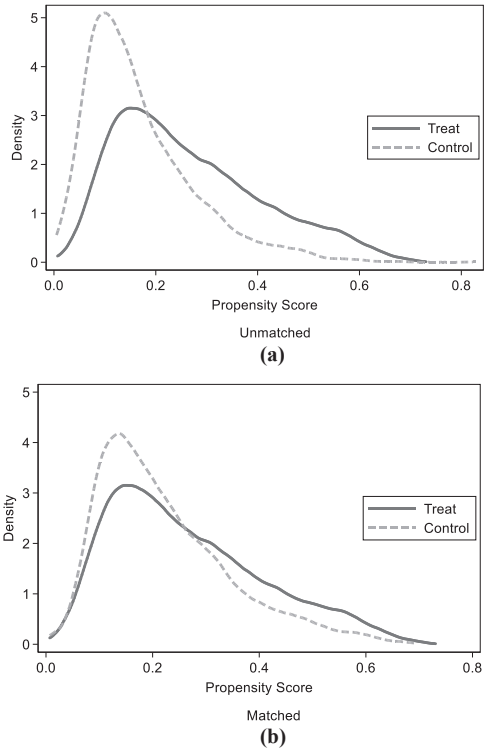
Variable	Sample	Average value Treatment	Control	%bias	%reduce |bias|	*T*-test *T*-value	*p*>|*t*|
Size	Unmatched	22.299	22.387	−6.7	68.9	−2.57	0.010
	Matched	22.299	22.326	−2.1		−0.65	0.513
ROA	Unmatched	0.056	0.029	50.1	98.1	19.68	0.000
	Matched	0.056	0.056	−0.9		−0.29	0.772
Growth	Unmatched	0.284	0.196	15.9	80.9	5.92	0.000
	Matched	0.284	0.300	−3.0		−0.79	0.429
Lev	Unmatched	0.427	0.539	−58.6	99.4	−22.75	0.000
	Matched	0.427	0.426	0.3		0.11	0.914
AM	Unmatched	0.226	0.253	−16.2	84.6	−5.89	0.000
	Matched	0.226	0.230	−2.5		−0.83	0.409
CFO	Unmatched	0.456	0.034	16.0	96.4	6.20	0.000
	Matched	0.456	0.046	−0.6		−0.18	0.859
Top1	Unmatched	0.363	0.353	6.2	70.1	2.46	0.014
	Matched	0.363	0.366	−1.9		−0.57	0.570
Dual	Unmatched	0.363	0.193	38.7	92.9	16.36	0.000
	Matched	0.363	0.351	2.7		−0.78	0.434
QFII	Unmatched	0.001	0.001	7.2	90.8	2.97	0.003
	Matched	0.001	0.001	0.7		0.19	0.847

Note(s): This table presents the results of the PSM balance test of matching variables. Variable definitions are available in Appendix 2
Source(s): Table by authors

According to the decomposition results reported in Table 5, the average difference-in-differences (DID) estimation of *Open* is 0.094, which is close to the coefficient of *Open* in the first column of Table 3 (0.0953). The overall DID results in our research mainly stem from the estimation employing never-treated firms as the control group, with the weight as high as 97.1%. The potential bias introduced by using early-treated firms as the control group comprises only 0.7%, while always-treated firms account for 1.1%. Both groups have minimal impacts on the overall estimation. Therefore, the multiperiod difference-in-differences estimations in our paper are reliable.

5.3.4 Heckman two-stage regression. Our analysis faces the self-selection problem. For example, firms with longer debt maturity structures may be more likely to be selected for the SHZHC trading list since extended debt maturity structures imply better creditworthiness, which can be a signal of high-quality firms. Therefore, we use the Heckman two-stage regression to address the self-selection bias.

In the first stage, a probit model is employed to estimate the probability of a company entering the SHZHC list. Following Sun and Sun (2021), we employ the presence of overseas branches as the instrument variable. We construct the dummy variable *Dfn*, which indicates whether the firm has overseas branches. Following Zhong and Lu (2018), the control variables in the first stage include *Size*, *ROA*, *Growth*, *CFO*, *Top1*, *Dual*, *Big4*, *Mshr* and *Turnover.*



Note(s): This figure presents the kernel density estimates before and after propensity score matching

Source(s): Figure by authors

Figure 2. Kernel density estimate

Variable definitions are presented in Appendix 2. In the second stage, the inverse Mills ratio (IMR) estimated in the first stage is included in the regression.

Table 6 reports the results of the Heckman two-stage regression. In Column (1), the coefficient of *Dfn* is 0.6207 and significant at the 1% level, indicating that firms with overseas branches are more likely to enter the SHZHC list. In Column (2), after IMR is added, the estimate of *Open* remains significantly positive at the 5% level, suggesting that the SHZHC increases the debt maturity structure of target firms. The results further validate the robustness of our conclusion after controlling for the sample selection bias.

5.3.5 Propensity score matching (PSM). Considering that there are significant differences between firms entering and not entering the trading list of the SHZHC, we apply propensity score matching (PSM) to mitigate this problem. We use control variables in Model (1) as the covariates of PSM and conduct 1:4 nearest-neighbor matching between the treatment and control firms.

Table 7 shows significant differences between the treatment and control firms in the matching variables before matching. However, after matching, we find no significant difference with respect to the matching variables between the two groups of firms, and the absolute value of the standardized difference remains within 10%. Furthermore, the kernel density estimates before and after matching are shown in Figure 2. The probability densities of the treatment and control firms are significantly different before matching. However, the probability densities are close after matching. The results suggest the effectiveness of our matching.

Table 8. Propensity score matching

Variable	DM
Open	0.0639***
	(2.99)
Size	0.0890***
	(8.67)
ROA	−0.0232
	(−0.26)
Growth	−0.0079*
	(−1.85)
Lev	0.0724*
	(1.81)
AM	0.0229
	(0.46)
CFO	0.1571***
	(3.70)
Top1	0.0015***
	(2.71)
Dual	−0.0106
	(−1.09)
QFII	−0.0159
	(−0.02)
Constant	−1.7012***
	(−7.64)
Firm FE	Control
Year FE	Control
R^2	0.2181
N	10,334

Note(s): This table presents the regression results of propensity score matching. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Table by authors

We rerun the regression of Model (1) based on the matched sample. Table 8 reports the results. We find that the coefficient on *Open* is 0.0639 and significant at the 1% level, providing further evidence that the SHZHC extends the corporate debt maturity structure.

5.3.6 Different samples. Before the implementation of the SHZHC, some listed companies had already been invested by overseas investors, such as Qualified Foreign Institutional Investors (QFIIs). To validate our conclusion, we exclude samples with foreign ownership and rerun the regression. Table 9 reports the results. It shows that the coefficient on *Open* remains significantly positive at the 1% level, confirming that the SHZHC increases the proportion of long-term debt of target firms.

In our sample, some firms have no long-term debt, while others are entirely composed of long-term debt. As a robustness test, we re-estimate the baseline model with a subsample that excludes observations with the extreme *DM* values of 0 or 1. Table 10 reports the regression results. It shows that the coefficient on *Open* remains significantly positive at the 5% level, suggesting that the SHZHC extends the debt maturity structure of target firms.

5.3.7 Debt maturity measurement. We construct an alternative measure of debt maturity *DM_new*, which is the ratio of noncurrent liabilities to total liabilities (Wang, Chiu, & King, 2020; Ruan, Jin, Lv, & Wei, 2023), and rerun the regression. Table 11 reports the results. The coefficient of *Open is* 0.0572 and significant at the 1% level, reflecting the positive effect of capital market liberalization on the corporate debt maturity structure.

Table 9. Excluding samples with foreign ownership

Variable	DM
Open	0.0641***
	(2.94)
Size	0.0964***
	(10.21)
ROA	−0.0312
	(−0.34)
Growth	−0.0076*
	(−1.69)
Lev	0.0833**
	(2.03)
AM	0.0024
	(0.05)
CFO	0.1473***
	(3.31)
Top1	0.0014**
	(2.34)
Dual	−0.0093
	(−0.94)
Constant	−1.8621***
	(−9.04)
Firm FE	Control
Year FE	Control
R^2	0.2135
N	9,465

Note(s): This table presents the regression results after excluding samples with foreign ownership. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Table by authors

6. Further analyses

6.1 Heterogeneity analysis

6.1.1 Management ownership. Capital market liberalization imposes stronger constraints on the self-interested behavior of managers, easing creditor concerns about agency problems and helping increase the proportion of long-term debt (Lian *et al.*, 2019; Jia & Wu, 2022; Wan *et al.*, 2022). When management ownership increases, it aligns the interests of shareholders and managers, inhibiting self-interested management behavior (Jensen & Meckling, 1976). Therefore, the impact of the SHZHC on the corporate debt maturity structure should weaken with increasing management ownership. To test this prediction, we divide sample firms on the basis of the mean of management ownership and rerun Model (1) for each group.

Table 12 reports the results. We find that the coefficient of *Open* is significantly positive for firms with low management ownership, whereas it is insignificant for firms with high management ownership. These results suggest that the influence of capital market liberalization on the corporate debt maturity structure is more pronounced for firms with lower management ownership.

6.1.2 Big 4 audit. The literature shows that auditors play an important role in corporate governance. For example, firms with higher-quality audits have lower IPO underpricing (Beatty, 1989), present higher informativeness of earnings (Teoh & Wong, 1993), have lower discretionary accruals (Becker, DeFond, Jiambalvo, & Subramanyam, 1998) and are less

Table 10. Excluding samples with extreme *DM* values

Variable	*DM*
Open	0.0519**
	(2.43)
Size	0.1102***
	(12.58)
ROA	0.0246
	(0.35)
Growth	−0.0064*
	(−1.72)
Lev	0.1450***
	(4.24)
AM	0.0523
	(1.21)
CFO	0.0793**
	(1.98)
Top1	0.0015***
	(2.87)
Dual	−0.0125
	(−1.43)
QFII	0.1267
	(0.15)
Constant	−2.2467***
	(−11.75)
Firm FE	0.0519**
Year FE	(2.43)
R^2	0.1163
N	9,828

Note(s): This table presents the regression results after excluding samples with the extreme *DM* values of 0 or 1. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Table by authors

Table 11. Alternative measure of debt maturity

Variable	DM_new
Open	0.0572***
	(2.76)
Size	0.0748***
	(5.92)
ROA	−0.1553
	(−1.60)
Growth	−0.0013
	(−0.22)
Lev	0.0620
	(1.21)
AM	0.0739
	(1.45)
CFO	0.0425
	(0.65)
Top1	0.0009
	(1.37)
Dual	−0.0052
	(−0.41)
QFII	−0.5978
	(−0.80)
Constant	−2.0204***
	(−7.34)
Firm FE	Control
Year FE	Control
R^2	0.1053
N	10,351

Note(s): This table presents the regression results of the alternative measurement of debt maturity. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively
Source(s): Table by authors

likely to conduct fraud (Farber, 2005). Therefore, we expect that the SHZHC might have a greater effect on the debt maturity structure of firms with lower-quality audits. We use whether the firm is audited by Big 4 auditors to measure audit quality. We divide sample firms into two groups according to their auditors and rerun Model (1) for each group.

Table 13 presents the results. In Column (1), the coefficient for *Open* is 0.0632 and significant at the 1% level for firms with non-Big 4 audit. In Column (2), the coefficient on *Open* is insignificant for firms audited by Big 4. These results illustrate that the positive impact of the SHZHC on the corporate debt maturity structure is more significant for firms with non-Big 4 audit.

6.2 Channel test

According to the previous argument, capital market liberalization extends the corporate debt maturity structure through two channels: (1) improving information environment and (2) constraining self-interested management behavior. Enhancing information environment mitigates information asymmetry, while imposing constraints on self-interested management behavior reduces agency costs. Together, these ease the concerns of creditors and facilitate firms in obtaining long-term debt (Flannery, 1986; Leland, 1998; Shyu & Lee, 2009). This sector examines these two channels.

Table 12. Cross-sectional analysis of management ownership

	DM	
	(1)	(2)
Variable	Low management ownership	High management ownership
Open	0.0794***	−0.0218
	(2.75)	(−0.56)
Size	0.0836***	0.0996***
	(6.79)	(5.28)
ROA	0.0238	−0.0015
	(0.23)	(−0.01)
Growth	−0.0073	−0.0242**
	(−1.39)	(−2.07)
Lev	0.0342	0.2494***
	(0.76)	(2.83)
AM	0.0126	−0.0381
	(0.25)	(−0.30)
CFO	0.1261***	0.2181**
	(2.59)	(2.26)
Top1	0.0017***	0.0005
	(2.64)	(0.33)
Dual	−0.0066	−0.0218
	(−0.56)	(−0.84)
QFII	0.1275	−1.8958
	(0.12)	(−1.02)
Constant	−1.5677***	−1.9539***
	(−5.84)	(−4.76)
Firm FE	Control	Control
Year FE	Control	Control
R^2	0.2158	0.2549
N	7,893	2,458

Note(s): This table presents the regression results of the cross-sectional analysis of management ownership. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively
Source(s): Table by authors

Following Pu (2022), we use information disclosure grade (*Grade*) to measure firms' information environment, which is rated by the Shanghai Stock Exchange and the Shenzhen Stock Exchange. Further, following Wei, Li, Wu, and Huang (2017), we employ total asset turnover (*Turnover*) to measure firms' agency costs, equal to operating income divided by average total assets.

Table 14 presents the results. In Column (1), the coefficient of *Open* is positive and significant at the 1% level, indicating that the SHZHC improves the information environment of target firms. Furthermore, Column (2) shows that the coefficient on *Open* enters positively, meaning that capital market liberalization inhibits the self-interested behavior of managers and reduces firms' agency costs. The above results verify the effect of capital market liberalization on debt maturity structure through the channels of improving firms' information environment and constraining self-interested management behavior.

7. Conclusion

Using the quasi-natural experiment of the SHZHC, this paper constructs a difference-in-differences model to investigate the impact of capital market liberalization on the corporate debt maturity structure. The empirical results show that the SHZHC significantly increases the

Table 13. Cross-sectional analysis of Big 4 audit

	DM	
	(1)	(2)
Variable	Non-Big 4 audit	Big 4 audit
Open	0.0632***	−0.0217
	(2.87)	(−0.31)
Size	0.0956***	0.0820
	(9.83)	(1.46)
ROA	−0.0152	−0.2739
	(−0.17)	(−0.65)
Growth	−0.0095**	0.0227
	(−2.19)	(0.89)
Lev	0.0833**	−0.1325
	(2.08)	(−0.55)
AM	0.0217	−0.0938
	(0.43)	(−0.44)
CFO	0.1509***	0.2885
	(3.48)	(1.46)
Top1	0.0014**	0.0030
	(2.45)	(1.28)
Dual	−0.0153	0.0249
	(−1.52)	(0.69)
QFII	0.1950	4.8720*
	(0.24)	(1.67)
Constant	−1.8444***	−1.4476
	(−8.68)	(−1.09)
Firm FE	Control	Control
Year FE	Control	Control
R^2	0.2056	0.2227
N	9,943	408

Note(s): This table presents the regression results of the cross-sectional analysis of Big 4 audit. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively
Source(s): Table by authors

proportion of long-term debt of target firms. The conclusion holds after several robustness tests, such as the parallel trend test, the placebo test, the Heckman two-stage regression, and the PSM regression. In further analyses, we find that the impact of the SHZHC on the debt maturity structure is more significant for firms with lower management ownership and non-Big 4 audit. Finally, our channel tests indicate that the SHZHC improves firms' information environment and restrains self-interested management behavior, which extends the corporate debt maturity structure.

Our research has some practical implications. First, the results show that improving information environment and restraining self-interested management behavior are important ways to address the unbalanced debt maturity structure. The SHZHC lengthens the debt maturity structure of target firms by enhancing information transparency and lowering agency costs. This study provides a reference for financial institutions to make credit decisions and for regulators to improve firms' financing conditions through capital market liberalization. Second, our analysis sheds light on the positive impact of the SHZHC on firm operation. After capital market liberalization, expropriation of shareholder interests seems no longer feasible for listed companies. In contrast, it is beneficial for firms to improve information disclosure and constrain self-interested management behavior. Finally, our research suggests that opening the capital market is critical for improving corporate governance and enhancing the resource allocation efficiency of the capital market.

Table 14. Channel test

	(1) Grade	(2) Turnover
Open	0.1241***	0.1258***
	(2.71)	(2.96)
Size	0.1267***	−0.0191*
	(10.96)	(−1.75)
Lev	−0.4872***	0.2222***
	(−7.08)	(3.77)
Growth	−0.0721***	0.1130***
	(−5.13)	(9.11)
Top1	0.0024***	0.0019**
	(3.07)	(2.42)
Dual	−0.0025	−0.0329*
	(−0.12)	(−1.69)
CFO	0.2064	
	(1.56)	
ROA	3.1749***	
	(13.27)	
Big4		0.0374
		(0.60)
Loss		0.1604***
		(8.26)
QFII	6.2022***	7.6974***
	(2.82)	(3.17)
Constant	0.2122	0.8036***
	(0.93)	(3.67)
Firm FE	Control	Control
Year FE	Control	Control
R^2	0.1808	0.0656
N	6,520	10,351

Note(s): This table presents the regression results of channel test. Variable definitions are available in Appendix 2. *T*-values are reported in parentheses. ***, ** and * denote statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Table by authors

Note

1. https://sc.hkex.com.hk/TuniS/www.hkex.com.hk/Market-Data/Statistics/Consolidated-Reports/Annual-Market-Statistics?sc_lang=en

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Further reading

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Appendix 1

Table A1. Annual trading volume of the SHZHC

Year	2014	2015	2016	2017	2018	2019	2020
Trading volume	0.168	1.471	0.771	2.266	4.674	9.757	21.089

Note(s): This table presents the annual trading volume of the SHZHC. The unit is trillion in RMB
Source(s): Table by authors

Appendix 2

Table A2. Variable definition

Symbol	Name	Definition
DM	Corporate debt maturity	Long-term debt/total debt
DM_new	Corporate debt maturity	Non-current liabilities/total liabilities
Open	Capital market liberalization	If the firm enters the trading list of the SHSHC, it takes the value of one, and zero otherwise
Size	Firm size	The natural logarithm of total assets
ROA	Return on assets	Net profit/average total assets
Growth	Growth rate	(Revenues of year t − revenues of year t–1)/revenues of year t–1
Lev	Leverage	Total liabilities/total assets
AM	Asset duration	Fixed assets/total assets
CFO	Cash flows	Cash flows from operating activities/total assets
Top1	Large shareholder ownership	The percentage of shares held by the largest shareholder
Dual	Duality of chairman and CEO	If the chairman and the CEO are the same person, it takes the value of one, and zero otherwise
QFII	QFII ownership	The percentage of shares held by QFII investors
Mshr	Management ownership	The percentage of shares held by firm management
Big4	Big 4	If the firm is audited by a Big 4 firm, it takes the value of one, and zero otherwise
Grade	Information quality	The information disclosure grade by the Shanghai Stock Exchange and the Shenzhen Stock Exchange; the grades include A, B, C and D, indicating "excellent," "good," "qualified" and "unqualified" respectively, and are assigned corresponding values of 4, 3, 2 and 1
Turnover	Asset turnover	Operating income/average total assets

Source(s): Table by authors

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