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Debt capacity, debt choice, and underinvestment problem: Evidence from China

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ABSTRACT

This study investigates how short-term debt and debt capacity help firms to make efficient financing decisions and reduce underinvestment problem. The sample includes Chinese nonfinancial firms listed on the Shanghai and Shenzhen Stock Exchanges over the period 2007 to 2017. The findings indicate that short-term debt is positively related to leverage. The results also indicate that growth positively influences leverage. The results further show that short-term debt enhances the positive impact of growth on leverage. These findings reveal that short-term debt makes firms financially flexible, and allows them to obtain more cost-effective debt by repricing and renegotiation of debt contracts in the presence of valuable growth opportunities. Furthermore, the results illustrate that debt capacity is positively associated with leverage, suggesting that debt capacity helps firms to have an easy access to the credit market and reduce liquidity risk. Overall, the findings remain consistent across different types of firms (state-owned [S.O.E.] and non-state-owned enterprises [N.S.O.E.]) and by considering alternative proxy of growth.

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1. Introduction

The agency conflicts of creditors–shareholders have attained huge consideration in the literature. The conflict of interest between creditors and shareholders leads managers to act in the interest of shareholders, and make different choices of debt to equity ratios and maturities of debt to mitigate the risk associated with debt. Firms with risky debt may face a debt overhang problem in the presence of shareholders–creditors conflicts. Risky debt may not allow highly levered firms to invest in new investment projects, even if projects have positive N.P.V.s, which results in underinvestment problem.

The relation of financing–investment decisions is considerably discussed in the literature. Modigliani and Miller (1958) argue that in perfect capital markets, a firm's

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financing and investment decisions are not interdependent, and capital structure is irrelevant. However, theoretical and empirical research examined how various market imperfections can make financing and investment decisions interrelated. Myers (1977) suggests that in highly levered firms with high-growth opportunities, managers may give up some investment projects having positive N.P.V.s to protect shareholders' interest, which results in underinvestment problems. Therefore, the conflicts of interest between shareholders and creditors over the execution of investment opportunities will create potential underinvestment problems.

Myers (1977) argues that if debt matures before growth options are executed, a firm's incentive to deviate from a value-maximizing exercise policy is eliminated. Moreover, Childs, Mauer, and Ott (2005) suggest that short-term debt can mitigate both under- and over-investment problems by making debt less sensitive to changes in firm value and by allowing for more frequent repricing of debt. Diamond (1991) argues that short-term debt exposes firms to a liquidity risk. Further, Childs et al. (2005) argue that although short-term debt can mitigate incentives to under- or over-invest in growth options, this benefit must be balanced against the greater liquidity risk of refunding short-term debt. However, Lemmon and Zender (2010) argue that firms which are not constrained by concerns over debt capacity have more stable returns, and thereby have higher ratings. Such firms, with their lower roll-over risk (Diamond, 1991, 1993) and greater financial flexibility (Denis & McKeon, 2012), can shorten their debt maturity to reduce the underinvestment problem without reducing leverage (Johnson, 2003). The preceding discussion raises an empirical question that how short-term debt and debt capacity can help firms to reduce underinvestment problems.

Several studies examined corporate financing or investment decisions in isolation (Barclay & Smith, 1995; Fazzari, Hubbard, & Petersen, 1987; Kaplan & Zingales, 1997; Khan, Qin, & Jebran, 2019; Rajan & Zingales, 1995). For example, Aivazian, Ge, and Qiu (2005) document that leverage has a statistically significant and negative association with investment, which is in line with the overinvestment hypothesis. Although these studies investigate the impact of financing decisions on investment, some studies show how growth opportunities impact corporate financing decisions. Johnson (2003) and Billett, King, and Mauer (2007) investigate the impact of growth on the joint choice of debt maturity and leverage. They show that firms having high growth opportunities rely on more short-term debt or low leverage to alleviate underinvestment problems. Moreover, short-term debt can help firms to reduce underinvestment problem sufficiently, and thus eliminates the negative impact of growth on leverage (Johnson, 2003).

Dang (2011) examined the impact of financing decisions on investment in U.K. listed firms in a dynamic framework and provides empirical evidence that using debt maturity and leverage as strategic complements does not help U.K. firms to reduce debt overhang problems sufficiently. Some studies in the Chinese context support the link among choice of debt, growth and financial constraints. For example, Coad and Srhoj (2019) suggest that firms with higher short-term liabilities have a higher probability to become high growth firms. Lemmon and Zender (2019) elaborated that debt structure choice balances *ex ante* adverse selection against *ex post* moral hazards.

Moreover, Howell (2018) suggests that in response to fuel economy standards requiring firms to upgrade technology or sacrifice quality, firms with joint ventures reduced quality and price relative to their counterparts, and Howell (2019) reports that privately owned firms maintain a higher innovation performance compared with state-owned firms. However, prior studies have rarely investigated the possible factors, which can affect the interaction among debt choice, growth, and leverage. Making future capital structure adjustment overtime under static debt policy is very costly for firms. The costs that arise from investment deviations lead firms to reduce leverage and have no impact on debt maturity. The corporations always prefer long-term debt, although short-term debt can help them to reduce agency cost. Because the benefit to reduce agency costs is offset by the costs of liquidity risk related to short-term debt.

Dynamic debt policy gives firms financial flexibility and makes them capable of adjusting debt level over time. Thus, usually, short-term debt is considered optimal to mitigate sub-optimal investment decisions by repricing and renegotiating debt contracts. Debt capacity helps firms in reduction of liquidity risk associated with short-term debt, which allows firms to reduce leverage by reducing short-term debt in bad state (when firm value is low) and increase leverage by increasing short-term debt in good state (when firm value is high). Debt capacity helps firms to increase the debt level in the availability of valuable growth opportunities. Moreover, Lemmon and Zender (2010) suggest that higher debt capacity lead firms to higher credit ratings, and those firms also have stable returns. Such firms, with their lower liquidity risk and greater debt capacity, can use more short-term debt to decrease underinvestment problem without reducing leverage (Denis & McKeon, 2012; Diamond, 1991, 1993; Johnson, 2003).

In China, the major proportion of debt, that firms acquire are provided by financial institutions in the form of loans, because bond markets and capital markets in China are not very well established compared to developed countries. So, they provide limited financial support to the corporations (Cai, Fairchild, & Guney, 2008). Western economies rely more on long-term debt, as the mean value of debt maturity of OCED firms is approximately 0.57 (Dang, 2011). Comparatively, Chinese firms rely less on long-term debt (Cai et al., 2008; Jiang, Jiang, & Kim, 2017). Moreover, Chinese legal environment, banking system, institutional structure, and corporate governance are based on modern socialization model and are considered different from developed economies (Chen, Firth, Gao, & Rui, 2006; Fan, Lau, & Young, 2007; Gul, 1999; Lam & Du, 2004; Jebran, Chen, & Tauni, 2019).

Based on the preceding discussion, this study fills the gap in literature by investigating how short-term debt and debt capacity help Chinese firms to alleviate the underinvestment problem. Furthermore, investigating the agency cost theory in the Chinese context can provide interesting results, because Chinese firms have unique characteristics, which are different from firms in developed economies. Therefore, this study comprehensively investigates the interactions among debt capacity, short-term debt, growth, and leverage in a unified and dynamic framework.

The study adds several contributions to the literature. First, the study investigates the relationship between short-term debt and leverage, and findings suggest that short-term debt is positively related to leverage. So, the study reports and establishes

the positive relationship between short-term debt and leverage. Second, this study examines whether short-term debt can enhance the positive impact of growth on leverage. The results illustrate that short-term debt enhances the positive impact of growth on leverage. The findings support the argument that short-term debt paves the way for gradual and continuous renegotiation process, which gives firms' opportunity to make flexible financing decisions. Third, this study investigates the relationship between debt capacity and leverage. The results indicate that debt capacity is positively related to leverage, which reveals that debt capacity help firms to have easy access to credit market and reduce liquidity risk. Finally, this study investigates whether short-term debt and debt capacity can help firms for alleviating underinvestment problems. The findings of the study elaborate that growth is found to have a positive effect on leverage, which suggests that debt capacity and short-term debt help firms to reduce underinvestment problem sufficiently.

The rest of the study is organized as follows. Section two includes the literature review and hypotheses. Section three discusses research methodology. Section four reports and discusses the results. Finally, section five provides conclusions.

2. Literature review and hypotheses development

The agency cost model discusses potential interaction among short-term debt, growth, and leverage (Myers, 1977). It is argued in the principal-agent model that as a consequence of agency conflict among shareholders, creditors, and managers (agents of shareholders), firms may give up projects with positive N.P.V.s due to underinvestment problem. The debt overhang risk associated with outstanding debt can be alleviated by reducing leverage or by using short-term debt. Interaction among leverage, short-term debt, and growth are affected by two conditions: (1) using more short-term debt to control debt overhang problem; and (2) liquidity risk associated with short-term debt.

Short-term debt can alleviate creditors–shareholders conflicts over the execution of growth opportunities. Myers (1977) suggests that expiry of short-term debt before the execution of new investment project eliminates a firm's incentive to deviate from its policy of value-maximizing. Moreover, Childs et al. (2005) argue that short-term debt allows firms to make frequent repricing of debt contracts, thereby, reduce both underinvestment and overinvestment problems. Chinese firms rely on a big proportion of short-term debt (Jiang et al., 2017; Mirza, Jebran, Yan, & Iqbal, 2017). Larger proportion of short-term debt makes firms financially flexible, and financial flexibility allows firms to increase leverage in good state (when firm value is high) by increasing short-term debt, it also helps firms to reduce leverage in bad state (when firm value is low) by reducing short-term debt. Therefore, we expect that short-term debt has a positive effect on leverage, and develops the following hypothesis.

Hypothesis 1 (H1). *Short-term debt is positively associated with leverage*

Using of short-term debt that expires before the execution of a new investment project enables shareholders to get full advantage of new projects by renegotiating debt contracts. Myers (1977) and Johnson (2003) suggest that short-term debt can

alleviate underinvestment problems, and sufficient reduction of such problems can eliminate the negative impact of growth on leverage.

Firms facing underinvestment problems may not be able to exploit available growth opportunities. Some empirical studies support the negative link of growth-leverage. For instance, some studies report that growth and leverage are negatively related (Homaifar, Zietz, & Benkato, 1994; Ozkan, 2001; Rajan & Zingales, 1995). Barclay, Marx, and Smith (2003) investigate the nature of relationship between growth opportunities and leverage by using extensive data, and document that growth opportunities affect leverage negatively.

Previous studies provide evidence in support of a negative association between growth and leverage for developed economies, where firms rely largely on long-term debt. For example, Dang (2011) argues that when valuable growth opportunities are available, financially flexible firms may issue more short-term debt to finance growth opportunities. Hence, the total leverage will increase, which results in a positive association between growth and leverage. We expect that relying more on short-term debt gives firms financial flexibility, which enables them to issue more debt in the presence of growth opportunities. Therefore, we develop the following hypothesis.

***Hypothesis 2 (H2)**. Growth is positively associated with leverage*

Debt capacity refers to the borrowing ability of a firm, and it reflects the capability of a company to pay back borrowed money within a specified period. Financially constrained firms may receive funds from government, which encourage them to invest in valuable growth opportunities. Because access to government funds increases the capacity to borrow funds, Howell (2017) suggests that government support have positive effect on finance, revenue, and survival of financially constrained younger firms. Further, Criscuolo, Martin, Overman, and Van Reenen (2019) report that subsidies from the government to small firms increase manufacturing employment. In addition, Lemmon and Zender (2010) suggest that higher debt capacity leads firms to higher credit ratings, and those types of firms also have stable returns. Such firms, with their greater debt capacity and lower liquidity risk, can rely on short-term debt to decrease the underinvestment problems without reducing leverage (Denis & McKeon, 2012; Diamond, 1991, 1993; Johnson, 2003). In contrast, firms who have debt capacity constraints are less able to gain access to debt market due to low credit rating (Lemmon & Zender, 2010).

Based on the preceding discussion, we expect that debt capacity helps firms to have easy access to the credit market, obtain more debt, and hence debt capacity increases leverage. Therefore, we hypothesize that:

***Hypothesis 3 (H3)**. Debt capacity is positively associated with leverage*

Short-term debt can alleviate stockholder–creditor problems over exploiting valuable growth opportunities. Childs et al. (2005) argue that short-term debt can reduce underinvestment problems by allowing firms for more frequent repricing of debt. Diamond (1991) discusses that liquidity risk is associated with short-term debt if creditors deny agreeing for refinancing. Due to liquidity risks, those firms, having valuable growth opportunities, can use short-term debt. Childs et al. (2005) discuss that even though short-term debt can alleviate debt overhang problems, but this

benefit must be balanced against the cost of liquidity risk. The study further suggests that the use of short-term debt helps firms to issue more debt when valuable growth opportunities are available.

Based on the preceding discussion, we conclude that short-term debt can help firms to enhance the positive impact of growth on leverage. Hence, we hypothesize that:

Hypothesis 4 (H4). *Short-term debt enhances the positive impact of growth on leverage.*

3. Methodology

3.1. Sample and data

The sample includes nonfinancial firms listed on the Shenzhen and Shanghai stock exchange over the period 2007 to 2017. The adoption of new accounting standards in 2005 and initiation of non-tradable shares reform in 2006 are the main reasons to restrict our sample from 2007 to 2017. Data is extracted from the China Stock Market and Accounting Research Database (C.S.M.A.R.). In the data filtration process, we exclude B share listed firms, missing values, quarterly and monthly data. We only consider annual observations of A-share nonfinancial listed firms. After filtration, the final dataset is comprised of 2,774 firms consisting 18,677 observations.

3.2. Methodology

The difference (*DIFF GMM*) and system (*SYS GMM*) generalized method of moments at the second stage are used in the study to overcome biases. *GMM* dynamic models take the first difference of all the variables of a dynamic equation and being robust to heteroscedasticity and cross-correlation. It overcomes all non-linear restrictions (Arellano & Bond, 1991; Blundell & Bond, 1998). *GMM* has been used in many previous studies (Brown & Petersen, 2009; Guariglia, 2008; Guariglia, Liu, & Song, 2011). The following are the econometric equations for estimation purpose:

Leverage equations

$$LEV_{i,t} = \alpha_{0+}\delta_{lev}LEV_{i,t-1} + \alpha_1 SDEBT_{i,t} + \alpha_2 GTH_{i,t} + \alpha_3 DCAP_{i,t} + x^{lev}_{(i,t)}\beta^{LEV} + u_{i,t}, \tag{1}$$

$$\begin{aligned} LEV_{i,t} = {} & a_{0+}d_{lev}LEV_{i,t-1} + a_1 SDEBT_{i,t} + a_2 GTH_{i,t} + a_3 DCAP_{i,t} \\ & + a_4 SDEBT * GTH + x^{lev}_{(i,t)}\beta^{LEV} + u_{i,t}, \end{aligned} \tag{2}$$

where $LEV_{i,t}$ represents leverage, $LEV_{i,t-1}$ represents lagged value of leverage, *SDEBT* represents short-term debt, *GTH* represents growth opportunity and *DCAP* represents debt capacity, *SDEBT*GTH* represents the interaction term of short-term debt and growth, $x^{lev}_{i,t}$ includes control variables for leverage equation, $u_{i,t}$ represents error term. Description of variables is given in Table 1.

Table 1. Description of variables.

Symbol	Variable	Description
LEV	Leverage	Total liabilities / total assets
SDEBT	Short-term debt	Short-term debt / total liabilities
GTH	Tobinq	Market value/ Book value of assets
SGTH	Sales Growth	Growth rate of operating income
DCAP	Debt Capacity	[Fixed assets / (Long-term debt + equity)]
EFTR	Effective Tax Rate	Tax expense / EBIT
TA	Total Assets	Natural log of total assets
ROA	Return on Assets	EBIT/total assets
BSIZE	Board Size	Total number of members of the board
CEODUA	Dual Leadership	1 if the chairman of the board is holding both positions i.e., chairman of the board and CEO, otherwise 0
INDBOARD	Independent Directors	Ratio of independent board members to total members of the board

Source: Authors formation.

3.3. Measurement of variables

Leverage is defined as obligations that corporates need to pay back. Following previous studies (Fan, Huang, & Zhu, 2013; Xiao & Li, 2016; Yang, Han, Li, Yin, & Tian, 2017), we measure leverage (*LEV*) as total liabilities scaled by total assets. Short-term debt can be defined as the debt having a maturity period of less than one year, we measure short-term debt (*SDEBT*) as short-term debt over total liabilities. Growth can be defined as growth opportunities. Following previous studies (Coles, Daniel, & Naveen, 2006; Su, 2010), we use Tobinq as a proxy of growth (*GTH*) and measure it as market value over book value of assets. Following Yang et al. (2017), we use sales growth as an alternative proxy of growth. Debt capacity can be defined as the borrowing ability of a firm. Following Tse and Rodgers (2011), we measure debt capacity as fixed assets scaled by the sum of long term debt and equity.

3.4. Control variables

The trade-off theory suggests an association between the tax rate and leverage, and elaborate that firms' takes advantage of tax shield by using leverage (DeAngelo & DeAngelo, 2007; Fama & French, 2002). Following previous studies (Cai et al., 2008; Kane, Marcus, & McDonald, 1985), we control for effective tax rate (*EFTR*), and we measure it as tax expense over earnings before interest and tax.

Pecking order theory supports a negative leverage-profitability association (Myers, 1984; Myers & Majluf, 1984), contrary view supports a positive leverage-profitability relation (Jensen, 1986; Modigliani & Miller, 1963). We control for profitability and following Yu and Ashton (2015), we measure it as earnings before interest and taxes over total assets.

Bigger firms face low transaction and bankruptcy costs and possibly use more leverage, thus, indicating a positive size-leverage nexus (Frank & Goyal, 2003, 2009). We use the natural log of total assets to control for firm size (Fosu, Danso, Ahmad, & Coffie, 2016; Gilson, 1997; Qian & Yeung, 2015).

We also control for corporate governance variables that include board size, dual leadership, and board independence. Studies support a positive link between leverage and board size (Wang, 2012). Further, Agrawal and Knoeber (1996) argue that to reduce managerial discretional cash flow, leverage may be used as an alternative

governance mechanism. We calculate board size as total number of members of the corporate board. We measure dual leadership by using a dummy variable, and we assign 1 if the C.E.O. is also board chair, otherwise 0. We measure board independence by the ratio of independent directors to total directors.

4. Results and discussion

4.1. Results

4.1.1. Descriptive statistics

Table 2 reports descriptive statistics. The mean value of the leverage (*LEV*) is 0.492. The mean value of short-term debt (*SDEBT*) is 0.26. The mean value of growth (*GTH*) and alternative proxy of growth (*SGTH*) are 1.99 and 0.204, respectively. The mean value of debt capacity (*DCAP*) is 0.463. The mean values of effective tax rate (*EFTR*), natural log of total assets (*TA*), and return on assets (*ROA*) are 0.174, 22.14, and 0.044, respectively. The mean values of board size (*BSIZE*), dual leadership (*CEODUA*), and board independence (*INDBOARD*) are 8.91, 0.213, and 0.37, respectively.

4.1.2. Pairwise correlation analysis and multicollinearity test

Table 3 reports the findings of correlation analysis, and it also reports the results of multicollinearity test. The V.I.F. values are less than 2 for all variables, which suggests that there are no issues of multicollinearity. The results reveal that short-term debt

Table 2. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
LEV	18,677	0.492	0.196	0.123	0.902
SDEBT	18,677	0.26	0.325	0	1
GTH	18,677	1.991	1.715	0.265	9.735
SGTH	18,677	0.204	0.427	−0.494	2.117
DCAP	18,677	0.463	0.378	0.005	1.678
EFTR	18,677	0.174	0.15	−0.217	0.622
TA	18,677	22.142	1.321	16.52	28.509
ROA	18,677	0.044	0.046	−0.111	0.152
BSIZE	18,677	8.91	1.81	3	19
CEODUA	18,677	0.213	0.409	0	1
INDBOARD	18,677	0.37	0.055	0.091	0.8

Notes. This table reports descriptive statistics. See Table 1 for variables definitions.
Source: Authors formation.

Table 3. Pairwise correlation and results of multicollinearity test.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	VIF
(1) *LEV*	1.00										
(2) *SDEBT*	0.04*	1.00									1.15
(3) *GTH*	0.38*	−0.08	1.00								1.47
(4) *DCAP*	0.35*	0.23*	−0.20*	1.00							1.16
(5) *EFTR*	0.05*	−0.05*	−0.12*	−0.05*	1.00						1.05
(6) *TA*	0.36*	−0.22*	−0.49*	0.10*	0.13*	1.00					1.57
(7) *ROA*	−0.27*	−0.08*	0.15*	−0.14*	0.13*	0.07*	1.00				1.10
(8) *BSIZE*	0.13*	−0.04*	−0.16*	0.17*	0.03*	0.24*	0.04*	1.00			1.34
(9) *CEODUA*	−0.12*	0.06*	0.12*	−0.09*	−0.05*	−0.13*	0.01*	−0.16*	1.00		1.05
(10) *INDBOARD*	−0.01	−0.07	0.04*	−0.06*	0.01	0.05*	−0.04*	−0.40*	0.09*	1.00	1.239

Notes. * shows the level of significance at 1%. See Table 1 for variables definitions.
Source: Authors formation.

(*SDEBT*), growth (*GTH*), and debt capacity (*DCAP*), have positive correlations with leverage *(LEV)*. The results further suggest that effective tax rate (*EFTR*), natural log of total assets (*TA*), and board size (*BSIZE*) also have positive correlations with leverage (*LEV*). Return on asset (*ROA*) and dual leadership of board (*CEODUA*) are found to have a negative correlation with leverage (*LEV*). Further, board independence (*INDBOARD*) is found to have an insignificant correlation with leverage (*LEV*).

4.1.3. Findings of leverage equation

Table 4 reports the results of *DIFF GMM* and *SYS GMM* for baseline leverage equation. Column (1) reports the results of *DIFF GMM* and column (2) reports results of *SYS GMM*. To test the validity of dynamic models, Sargan test and Arrellano-Bond test are used to analyse over-identification of instruments and serial correlation in residuals. Sargan test's *p*-value and *AR(2)* are above 10%, which supports the validity of the model. The lagged value of leverage has significant and positive coefficients in both columns, which supports the decision of choosing a dynamic model for estimation.

The coefficients of short-term debt (*SDEBT*) in column (1) and (2) are 0.0581 and 0.0606, and both coefficients are positively significant at 1%. This reveals that

Table 4. Findings of leverage equation.

	Dependent variable = Leverage	
Variables	(1) DIFF GMM	(2) SYS GMM
LEV_{t-1}	0.639***	0.663***
	(0.0253)	(0.0186)
SDEBT	0.0581***	0.0606***
	(0.0103)	(0.0103)
GTH	0.00811***	0.00816***
	(0.00171)	(0.00170)
DCAP	0.114***	0.108***
	(0.00843)	(0.00805)
EFTR	−0.00486	−0.00629
	(0.00482)	(0.00487)
TA	0.0739***	0.0716***
	(0.00662)	(0.00645)
ROA	−0.545***	−0.547***
	(0.0322)	(0.0314)
BSIZE	−0.000319	−0.000115
	(0.00124)	(0.00124)
CEODUA	0.000413	0.00184
	(0.00349)	(0.00351)
INDBOARD	−0.0566**	−0.0504*
	(0.0273)	(0.0276)
Constant	−0.178	−0.135
	(0.145)	(0.138)
Year	Yes	Yes
Observations	12,060	14,969
Number of Stkcd	2,208	2,468
AR(1)	−16.85***	−19.44***
AR(2)	−0.95	−0.90
Sargan (p-value)	0.25	0.15

Notes. This table reports the findings of leverage equation. Arrellano-Bond tests are represented by AR(1) & AR(2) for serial correlation in residuals. Sargan (*p*-value) refers to the *p*-value of Sargan test to check the over-identification of instruments. Values of standard errors are given in parenthesis. ***, **, and * shows the level of significance at 1%, 5%, and 10%. See Table 1 for variables definitions.
Source: Authors formation.

short-term debt positively associated with leverage. Hence, the findings support predictions of Hypothesis 1.

The coefficients of growth (*GTH*) in columns (1) and (2) are 0.0081 and 0.0081, which are positively significant at 1%, indicating that growth is positively associated with leverage. Hence, the results are in line with Hypothesis 2.

The coefficients of debt capacity (*DCAP*) in columns (1) and (2) are 0.114 and 0.108, and both coefficients are positively significant at 1%, which shows that debt capacity is positively associated with leverage. Thus, the findings are in line with Hypothesis 3.

4.1.4. Moderating effect of short-term debt

Table 5 reports the findings of the moderating impact of short-term debt on the relation between growth-leverage. We use growth (*GTH*) and interaction term (*SDEBT*GTH*) separately to avoid any possible interaction between the variables. We apply both *DIFF GMM* and *SYS GMM* to attain robust estimates. We report results

Table 5. Moderating effect of short-term debt on the relationship between growth and leverage.

	Dependent variable = Leverage			
	DIFF GMM		SYS GMM	
Variables	(1)	(2)	(3)	(4)
LEV_{t-1}	0.639***	0.636***	0.663***	0.663***
	(0.0253)	(0.0255)	(0.0186)	(0.0188)
SDEBT	0.0581***	0.0269**	0.0606***	0.0282**
	(0.0103)	(0.0120)	(0.0103)	(0.0121)
GTH	0.00811***		0.00816***	
	(0.00171)		(0.00170)	
*SDEBT*GTH*		0.0137***		0.0143***
		(0.00334)		(0.00336)
DCAP	0.114***	0.114***	0.108***	0.108***
	(0.00843)	(0.00845)	(0.00805)	(0.00808)
EFTR	−0.00486	−0.00387	−0.00629	−0.00519
	(0.00482)	(0.00482)	(0.00487)	(0.00488)
TA	0.0739***	0.0655***	0.0716***	0.0631***
	(0.00662)	(0.00669)	(0.00645)	(0.00648)
ROA	−0.545***	−0.545***	−0.547***	−0.550***
	(0.0322)	(0.0325)	(0.0314)	(0.0318)
BSIZE	−0.000319	−0.000189	−0.000115	3.18e-05
	(0.00124)	(0.00123)	(0.00124)	(0.00124)
CEODUA	0.000413	0.000901	0.00184	0.00225
	(0.00349)	(0.00349)	(0.00351)	(0.00352)
INDBOARD	−0.0566**	−0.0531*	−0.0504*	−0.0468*
	(0.0273)	(0.0273)	(0.0276)	(0.0276)
Constant	−0.178	−0.170	−0.135	−0.122
	(0.145)	(0.147)	(0.138)	(0.141)
Year	Yes	Yes	Yes	Yes
Observations	12,060	12,060	14,969	14,969
Number of Stkcd	2,208	2,208	2,468	2,468
AR(1)	−16.85***	−16.71***	−19.44***	−19.32***
AR(2)	−0.95	−0.99	−0.90	−0.94
Sargan (p-value)	0.25	0.19	0.15	0.13

Notes. This table reports the result of moderating effect of short-term debt on the relationship between growth and leverage. Arrellano-Bond tests are represented by AR(1) & AR(2) for serial correlation in residuals. Sargan (*p*-value) refers to the *p*-value of Sargan test to check the over-identification of instruments. Values of standard errors are given in parenthesis. ***, **, and * shows the level of significance at 1%, 5%, and 10%. See Table 1 for variables definitions.

Source: Authors formation.

of *DIFF GMM* in columns (1) and (2), and results of *SYS GMM* in columns (3) to (4). To test the validity of dynamic models, Sargan test and Arrellano-Bond test are used to check the over-identification of instruments and serial correlation in residuals. Sargan test's *p*-value and *AR (2)* are above 10%, which supports the validity of the model. Coefficients of the lagged value of leverage are positive and significant in all four columns, hence support the decision of choosing *GMM* models for estimation.

The coefficients of short-term debt (*SDEBT*) in columns (1)–(4) are 0.0581, 0.0269, 0.0606, and 0.0282, respectively, which are positively significant at 1% level. The coefficients of growth (*GTH*) in columns (1) and (3) are 0.0081 and 0.0081, which are positively significant at 1%. The coefficients of interaction term (*SDEBT*GTH*) in columns (2) and (4) are 0.013 and 0.014, which are positively significant at 1%. The coefficients of debt capacity (*DCAP*) in columns (1)–(4) are 0.114, 0.114, 0.108, and 0.108, respectively, which are positively significant at 1%. The coefficients of growth, short-term debt, and debt capacity are in line with our main results. The coefficients of interaction terms of short-term debt and growth (*SDEBT*GTH*) support Hypothesis 4.

4.1.5. Additional analysis in S.O.E.s and N.S.O.E.s

Financial constraints don't allow firms to make a change in the debt structure (Dang, 2011). Furthermore, Cai et al. (2008) argue that the government financially supports some big Chinese firms. Therefore, state-owned enterprises (S.O.E.s) have larger leverage compared to others (Amin, Besim, & Haq, 2019). We are expecting that S.O.E.s in China are probably financially supported by government bodies in case of financial matters, so, they are less financially constrained than non-state-owned enterprises (N.S.O.E.s). There is the probability that firms with different characteristics may vary in behaviour in case of financing decisions. To investigate the behaviour of firms with different features like S.O.E.s and N.S.O.E.s, we conduct analysis separately across difference type of firm ownership.

Table 6 reports the findings of a separate analysis for S.O.E.s and N.S.O.E.s. We use *DIFF GMM* for estimation. We report results of *DIFF GMM* in columns (1) and (2) for *SOEs* and the results of *DIFF GMM* in columns (3) and (4) for *NSOEs*. To test the validity of dynamic models, Sargan test and Arrellano-Bond test are used in the study to check the over-identification of instruments and serial correlation in residuals. Sargan test's *p*-value and *AR(2)* are above 10%, which supports the validity of the model. The lagged value of leverage has significant and positive coefficients in both columns, hence support the decision of choosing a dynamic model for estimation.

The coefficients of short-term debt (*SDEBT*) in columns (1) to (4) are 0.0409, 0.0298, 0.0708, and 0.0266, respectively, which are positively significant at 1%. The coefficients of growth (*GTH*) in columns (1) and (3) are 0.00626 and 0.0104. In column (1), the coefficient of growth (*GTH*) is positively significant at 5%, and in column (3), it is positively significant at 1%. The coefficients of interaction terms of short-term debt and growth (*SDEBT*GTH*) in columns (2) and (4) are 0.00682 and 0.0161. In column (1), the coefficient of the interaction term *(SDEBT*GTH)* is positively significant at 10%, and in column (4) it is positively significant at 1%. In

Table 6. Findings of leverage equation for S.O.E.s and N.S.O.E.s.

	Dependent variable = Leverage DIFF GMM			
	SOEs		NSOEs	
Variables	(1)	(2)	(3)	(4)
LEV_{t-1}	0.667***	0.666***	0.580***	0.573***
	(0.0375)	(0.0377)	(0.0318)	(0.0319)
SDEBT	0.0409***	0.0298**	0.0708***	0.0266*
	(0.0129)	(0.0147)	(0.0140)	(0.0171)
GTH	0.00626**		0.0104***	
	(0.00246)		(0.00220)	
*SDEBT*GTH*		0.00682*		0.0161***
		(0.00544)		(0.00409)
DCAP	0.0828***	0.0815***	0.156***	0.156***
	(0.00836)	(0.00844)	(0.0142)	(0.0142)
EFTR	−0.00575	−0.00471	0.000739	0.00159
	(0.00548)	(0.00549)	(0.00791)	(0.00785)
TA	0.0760***	0.0688***	0.0800***	0.0663***
	(0.00804)	(0.00829)	(0.00986)	(0.00977)
ROA	−0.596***	−0.596***	−0.490***	−0.495***
	(0.0366)	(0.0371)	(0.0474)	(0.0476)
BSIZE	−0.00113	−0.00103	−2.11e-05	1.54e-06
	(0.00147)	(0.00147)	(0.00185)	(0.00186)
CEODUA	−0.00431	−0.00418	0.00292	0.00353
	(0.00468)	(0.00468)	(0.00453)	(0.00451)
INDBOARD	−0.0552	−0.0513	−0.0122	−0.00971
	(0.0338)	(0.0337)	(0.0394)	(0.0395)
Constant	−0.502***	−0.463***	−0.186	−0.159
	(0.180)	(0.179)	(0.206)	(0.209)
Year	Yes	Yes	Yes	Yes
Observations	6,213	6,213	5,847	5,847
Number of Stkcd	983	983	1,334	1,334
AR(1)	−10.94***	−10.90***	−12.82***	−12.64***
AR(2)	−1.18	−1.13	−.41	−.53
Sargan (p-value)	0.47	0.43	0.39	0.29

Notes. This table reports the findings of leverage equation for S.O.E.s and N.S.O.E.s. Arrellano-Bond tests are represented by AR(1) & AR(2) for serial correlation in residuals. Sargan (*p*-value) refers to the *p*-value of Sargan test to check the over-identification of instruments. Values of standard errors are given in parenthesis. ***, **, and * shows the level of significance at 1%, 5%, and 10%. See Table 1 for variables definitions.
Source: Authors formation.

columns (1) to (4), the coefficients of debt capacity (*DCAP*) are 0.0828, 0.0815, 0.156 and 0.156, respectively, which are positively significant at 1%. The results of all columns are consistent with main results. This reveal that the behaviour of Chinese firms does not vary across different type of ownership in case of financing decisions.

4.1.6. Robust test using an alternative proxy of growth

Table 7 reports the results of *GMM* for leverage equation with alternative proxy of growth i.e., sales growth, we apply both *DIFF GMM* and *SYS GMM* to attain robust estimates. Column (1) reports results of *DIFF GMM* and column (2) reports results of *SYS GMM*. To test the validity of dynamic models, Sargan test and Arrellano-Bond test are used to analyse the over-identification of instruments and serial correlation in residuals. Sargan test's *p*-value and *AR(2)* are above 10%, which supports the validity of the model.

The coefficients of short-term debt (*SDEBT*) in columns (1) and (2) are 0.0581 and 0.0612, which are positively significant at 1%. The coefficients of sales growth

Table 7. Findings of leverage equation with an alternative proxy of growth.

	Dependent variable = Leverage	
Variables	(1) DIFF GMM	(2) SYS GMM
LEV_{t-1}	0.638***	0.666***
	(0.0252)	(0.0183)
SDEBT	0.0581***	0.0612***
	(0.0103)	(0.0103)
SGTH	0.0121***	0.0127***
	(0.00258)	(0.00260)
DCAP	0.113***	0.106***
	(0.00838)	(0.00799)
EFTR	−0.00379	−0.00496
	(0.00482)	(0.00487)
TA	0.0524***	0.0497***
	(0.00639)	(0.00615)
ROA	−0.576***	−0.586***
	(0.0323)	(0.0315)
BSIZE	−0.000323	−0.000136
	(0.00123)	(0.00124)
CEODUA	0.000741	0.00194
	(0.00350)	(0.00353)
INDBOARD	−0.0531*	−0.0464*
	(0.0275)	(0.0277)
Constant	−0.0242	0.0224
	(0.145)	(0.138)
Year	Yes	Yes
Observations	12,060	14,969
Number of Stkcd	2,208	2,468
AR(1)	−16.91***	−19.45***
AR(2)	−0.53	−0.46
Sargan (p-value)	0.22	0.20

Notes. This table reports the findings of Leverage equation with an alternative proxy of growth. Arrellano-Bond tests are represented by AR(1) & AR(2) for serial correlation in residuals. Sargan (*p*-value) refers to the *p*-value of Sargan test to check the over-identification of instruments. Values of standard errors are given in parenthesis. ***, **, and * shows the level of significance at 1%, 5%, and 10%. See Table 1 for variables definitions.
Source: Authors formation.

(*SGTH*) in columns (1) and (2) are 0.0121 and 0.0127, which are positively significant at 1%. The coefficients of debt capacity (*DCAP*) in column (1) and (2) are 0.113 and 0.106, which are positively significant at 1%. The results are in line with our main findings.

Table 8 reports the findings of the moderating impact of short-term debt on the growth-leverage association (with an alternative proxy of growth). We apply both *DIFF GMM* and *SYS GMM* to attain robust estimates. We report results of *DIFF GMM* in columns (1) and (2), and results of *SYS GMM* in columns (3) and (4). To test the validity of dynamic models, Sargan test and Arrellano-Bond test are used to check the over-identification of instruments and serial correlation in residuals. Sargan test's *p*-value and *AR(2)* are above 10%, which supports the validity of model. Consistent with prior results, the lagged value of leverage has significant and positive coefficients in all four columns. Hence support the decision of choosing dynamic model for estimation.

The coefficients of short-term debt (*SDEBT*) in columns (1) to (4) are 0.0581, 0.0518, 0.0612, and 0.0546, respectively, which are positively significant at 1%. The coefficients of growth (*SGTH*) in columns (1) and (3) are 0.0121 and 0.0127, which are positively significant at 1%. The coefficients of interaction terms (*SDEBT** *SGTH*)

Table 8. Moderating effect of short-term debt on the relationship between growth and leverage with an alternative proxy of growth.

	Dependent variable = Leverage			
	DIFF GMM		SYS GMM	
Variables	(1)	(2)	(3)	(4)
LEV_{t-1}	0.638***	0.638***	0.666***	0.667***
	(0.0252)	(0.0252)	(0.0183)	(0.0184)
SDEBT	0.0581***	0.0518***	0.0612***	0.0546***
	(0.0103)	(0.0104)	(0.0103)	(0.0103)
SGTH	0.0121***		0.0127***	
	(0.00258)		(0.00260)	
*SDEBT*SGTH*		0.0349***		0.0358***
		(0.00946)		(0.00957)
DCAP	0.113***	0.113***	0.106***	0.106***
	(0.00838)	(0.00846)	(0.00799)	(0.00807)
EFTR	−0.00379	−0.00338	−0.00496	−0.00457
	(0.00482)	(0.00480)	(0.00487)	(0.00486)
TA	0.0524***	0.0540***	0.0497***	0.0512***
	(0.00639)	(0.00644)	(0.00615)	(0.00621)
ROA	−0.576***	−0.571***	−0.586***	−0.579***
	(0.0323)	(0.0326)	(0.0315)	(0.0318)
BSIZE	−0.000323	−0.000320	−0.000136	−0.000118
	(0.00123)	(0.00123)	(0.00124)	(0.00124)
CEODUA	0.000741	0.000556	0.00194	0.00184
	(0.00350)	(0.00350)	(0.00353)	(0.00354)
INDBOARD	−0.0531*	−0.0520*	−0.0464*	−0.0458*
	(0.0275)	(0.0274)	(0.0277)	(0.0277)
Constant	−0.0242	−0.0673	0.0224	−0.0157
	(0.145)	(0.146)	(0.138)	(0.140)
Year	Yes	Yes	Yes	Yes
Observations	12,060	12,060	14,969	14,969
Number of Stkcd	2,208	2,208	2,468	2,468
AR(1)	−16.91***	−16.86***	−19.45***	−19.42***
AR(2)	−0.53	−0.58	−0.46	−0.51
Sargan (p-value)	0.22	0.19	0.20	0.13

Notes. This table reports the results of moderating effect of short-term debt on the relationship between growth and leverage with an alternative proxy of growth. Arrellano-Bond tests are represented by AR(1) & AR(2) for serial correlation in residuals. Sargan (*p*-value) refers to the *p*-value of Sargan test to check the over-identification of instruments. Values of standard errors are given in parenthesis. ***, **, and * shows the level of significance at 1%, 5%, and 10%. See Table 1 for variables definitions.
Source: Authors formation.

in columns (2) and (4) are 0.0349 and 0.0358, which are positively significant at 1%. The coefficients of debt capacity (*DCAP*) in columns (1) to (4) are 0.113, 0.113, 0.106, and 0.106, respectively, which are positively significant at 1%. The findings are consistent with our main results.

Table 9 reports the findings of the leverage equation with an alternative proxy of growth, i.e., sales growth (*SGTH*) across different types of ownership, i.e., S.O.E.s and N.S.O.E.s. We use *DIFF GMM* for analysis, and report results of *DIFF GMM* in columns (1) and (2) for S.O.E.s, and report results of *DIFF GMM* in columns (3) and (4) for N.S.O.E.s. To test the validity of dynamic models, Sargan test and Arrellano-Bond test are used in the study to check the over-identification of instruments and serial correlation in residuals. Sargan test's *p*-value and *AR(2)* are above 10%, which supports the validity of the model. Consistent to prior results, the coefficients of the lagged value of leverage are positively significant across all columns, hence support the decision of choosing dynamic models for estimation.

Table 9. Findings of leverage equation with an alternative proxy of growth for S.O.E.s and N.S.O.E.s.

	Dependent variable = Leverage DIFF GMM			
	SOEs		NSOEs	
Variables	(1)	(2)	(3)	(4)
LEV_{t-1}	0.665***	0.663***	0.571***	0.573***
	(0.0372)	(0.0376)	(0.0315)	(0.0315)
SDEBT	0.0424***	0.0394***	0.0700***	0.0611***
	(0.0130)	(0.0128)	(0.0139)	(0.0140)
SGTH	0.00984***		0.0144***	
	(0.00346)		(0.00339)	
*SDEBT*SGTH*		0.0180*		0.0512***
		(0.0124)		(0.0119)
DCAP	0.0810***	0.0814***	0.156***	0.157***
	(0.00837)	(0.00845)	(0.0143)	(0.0143)
EFTR	−0.00476	−0.00462	0.00111	0.00186
	(0.00548)	(0.00546)	(0.00781)	(0.00779)
TA	0.0604***	0.0643***	0.0489***	0.0489***
	(0.00787)	(0.00791)	(0.00910)	(0.00913)
ROA	−0.619***	−0.606***	−0.532***	−0.535***
	(0.0368)	(0.0370)	(0.0470)	(0.0475)
BSIZE	−0.000922	−0.001000	−0.000309	−0.000410
	(0.00147)	(0.00146)	(0.00184)	(0.00184)
CEODUA	−0.00369	−0.00405	0.00290	0.00259
	(0.00467)	(0.00468)	(0.00452)	(0.00453)
INDBOARD	−0.0453	−0.0477	−0.0206	−0.0210
	(0.0339)	(0.0338)	(0.0393)	(0.0390)
Constant	−0.325*	−0.413**	0.00386	−0.000212
	(0.174)	(0.175)	(0.204)	(0.206)
Year	Yes	Yes	Yes	Yes
Observations	6,213	6,213	5,847	5,847
Number of Stkcd	983	983	1,334	1,334
AR(1)	−11.00***	10.92***	−12.78***	−12.75
AR(2)	−0.97	−1.03	−0.11	−0.10
Sargan (p-value)	0.42	0.44	0.39	0.37

Notes. This table reports the findings of leverage equation with an alternative proxy of growth for S.O.E.s and N.S.O.E.s. Arrellano-Bond tests are represented by AR(1) & AR(2) for serial correlation in residuals. Sargan (*p*-value) refers to the *p*-value of Sargan test to check the over-identification of instruments. Values of standard errors are given in parenthesis. ***, **, and * shows the level of significance at 1%, 5%, and 10%. See Table 1 for variables definitions.
Source: Authors formation.

In columns (1) to (4), the coefficients of short-term debt (*SDEBT*) are 0.0424, 0.0394, 0.0700, and 0.0611, respectively, which are positively significant at 1%. In columns (1) and (3), the coefficients of sales growth (*SGTH*) are 0.00984, and 0.0144, respectively, which are positively significant at 1%. In columns (2) and (4), the coefficients of interaction term (*SDEBT*SGTH*) are 0.0180, and 0.0512, respectively. In column (2), the coefficients of *SDEBT*SGTH* is positively significant at 10%, and in column (4), it is significant at 1%. In columns (1) to (4), the coefficients of debt capacity (*DCAP*) are 0.0810, 0.0814, 0.156 and 0.157, respectively, which are positively significant at 1%. The results of all columns are consistent with main findings.

4.2. Results discussion

4.2.1. Short-term debt and leverage

The results reveal that short-term debt positively associated with leverage. The findings remain consistent for S.O.E.s and N.S.O.E.s and by considering alternative proxy

of growth. The findings are consistent with Hypothesis 1, that is, short-term debt and leverage are positively associated, and thereby Hypothesis 1 is accepted.

One of the possible reasons for the positive association of short-term debt and leverage is that Chinese firms use a large proportion of short-term debt (Jiang et al., 2017). Short-term debt makes Chinese firms financially flexible, which allows them to increase leverage in good state by increasing short-term debt, it also helps Chinese firms to reduce leverage in bad state by reducing short-term debt. Our findings support the arguments that financial flexibility makes firms capable of adjusting debt level over time. Usually short-term debt is optimal, which helps firms to mitigate sub-optimal investment decisions by repricing and renegotiating debt contracts (Childs et al., 2005).

4.2.2. Growth and leverage

The results suggest that growth is positively associated with leverage. The findings remain consistent for S.O.E.s and N.S.O.E.s, and by considering alternative proxy of growth. The results are consistent to our Hypothesis 2, that is, growth and leverage are positively related, and thereby Hypothesis 2 is accepted.

One of the possible reasons for the positive relation of growth and leverage is that short-term debt helps Chinese firms to make flexible financing decisions and debt capacity help them to reduce liquidity risk. For instance, in the availability of valuable growth opportunities, Chinese firms obtain more short-term debt, which ultimately increase leverage, indicating a positive growth–leverage association. A positive sign of growth indicates that short-term debt and debt capacity help firms to reduce underinvestment problems sufficiently. Our results support the arguments that short-term debt that expires before the execution of a new investment project enable shareholders to gain full benefit from new investment projects by renegotiating and repricing of the debt contracts, and it can eliminate firms' incentives to deviate from value-maximizing exercise (Myers, 1977).

4.2.3. Debt capacity and leverage

The findings suggest that debt capacity has a positive and significant association with leverage. The findings are consistent for S.O.E.s and N.S.O.E.s and by considering alternative proxy of growth. The results are consistent with Hypothesis 3, that is, debt capacity positively influences leverage, and thereby Hypothesis 3 is accepted.

One of the possible reason for the positive association of debt capacity and leverage is that debt capacity reduce liquidity risk and enhances financial flexibility (Denis & McKeon, 2012; Diamond, 1991, 1993). Therefore, it can help firms to easily access the debt market, and obtain cost-effective debt. Our empirical evidence supports the argument that debt capacity helps firms to yield stable returns and have high credit quality, which ultimately leads them to have easy access to the credit market (Lemmon & Zender, 2010).

4.2.4. Moderating effect of short-term debt on the relationship between growth and leverage

The findings suggest that short-term debt strengthens the positive effect of growth on leverage. The results are consistent for S.O.E.s and N.S.O.E.s and by considering alternative

proxy of growth. The results are in line with Hypothesis 4, that is, short-term debt enhances the positive impact of growth on leverage, and thereby Hypothesis 4 is accepted.

The empirical evidence supports the argument that using short-term debt help firms in renegotiating and repricing of debt contracts (Childs et al., 2005). This, in turn, help firms to make optimal financing decisions and issue cost-effective debt in the availability of valuable growth opportunities. Therefore, short-term debt strengthens the influence of growth on leverage. Moreover, Coad and Srhoj (2019) provide support to our empirical findings and suggest that firms with higher short-term liabilities are more likely to become high growth firms.

5. Conclusion

This study investigates how short-term debt and debt capacity help firms to alleviate underinvestment problems. Based on the agency cost theory, we develop a unified framework that models the theoretical links among short term debt, debt capacity, growth opportunities, and leverage.

This study provides several contributions. We investigate the short-term debt and leverage association and find that short-term debt positively influences leverage. Further, we investigate the moderating effect of short-term debt on the relationship between growth and leverage. The findings suggest that short-term debt enhances the positive impact of growth on leverage. This suggests that short-term debt makes firms financially flexible, which allows them to increase leverage in good state by increasing short-term debt. It also help firms to reduce leverage in bad state by reducing short-term debt. Further, we investigate the debt capacity and leverage association. We document that debt capacity increases leverage, which suggests that debt capacity allows firms to easily access the credit market, thereby reduce liquidity risk and obtain cost-effective debt in the availability of growth opportunities. We also investigate the growth and leverage nexus and find that growth positively influences leverage.

Overall results suggest that Chinese firms make efficient financing decisions. Based on the findings of our study, we suggest that short-term debt can assist firms to make flexible financing decisions, and debt capacity may help them to reduce liquidity risk, which allows firms to obtain cost-effective financing in the availability of valuable growth opportunities. Therefore, positive relation of growth with leverage suggests that short-term debt and debt capacity help firms to reduce underinvestment problems. The findings remain consistent across different types of firms, i.e., S.O.E.s and N.S.O.E.s, and by considering alternative proxy of growth.

The findings of the study have several policy implications. Primarily, it suggests a policy initiative that short-term debt can help firms to make better financing decisions and reduce underinvestment problems. Second, it suggests that debt capacity encourages firms to choose short-term debt and reduce liquidity risk. Third, it suggests that decrease in agency costs may not encourage firms to simultaneously choose a higher initial debt level; since the firm's initial debt level choice also depends on the characteristics of the firm's growth option.

However, we acknowledge that there are some limitations of the study, and future research can address those limitations. First, the study does not investigate the behaviour of small–medium enterprises to reduce underinvestment problems. Second, due to the limited availability of data, the study does not examine how debt covenants play their role to reduce debt overhang problem. Future research can address the limitations of the study. First, future research can investigate the role of debt covenants in reducing underinvestment issues. Second, future research can replicate this study and examine whether a similar phenomenon occurs at different organizational levels and in different contexts.

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