Information Transparency, Debt and the Cost of Equity Capital: Evidence from China

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Abstract   This study adopted the signalling theory perspective to explore the effect of information transparency on the cost of equity capital among enterprises in China. Variables of information transparency and debt ratio were used to examine their influence on the cost of equity capital of enterprises in China between 2014 and 2015. The empirical results revealed that information transparency negatively affected the cost of equity capital, regardless of examining all observations simultaneously or examining the samples from 2014 and 2015 separately. However, the effect observed in 2014 was non-significant. In addition, debt positively moderated the effect of information transparency on the cost of equity capital. The results revealed that investors of the capital market paid attention to both financial and nonfinancial information disclosed by enterprises. This finding should be of great value to enterprise managers, supervisors, and decision-makers in financial or socioeconomic systems similar to that of China. Previous relevant studies have rarely explored emergent economies in socialist systems. The empirical results of this study facilitated reinforcing the research gap regarding how enterprises in socialist countries reduce their cost of equity capital amidst the economic development therein.

Keywords   Information Transparency, Cost of Equity Capital, Signalling, China

1. Introduction

Competitions in the global business environment and demand for financial funds are becoming increasingly intensive, in particular for emerging socialist economies such as China. The One Belt One Road Initiative and economic reforms in China have led to the uneven distribution of financial funds (Feng, 2017), possibly allowing some enterprises to easily meet their cost of capital requirements in a less costly manner, while causing other enterprises to acquire such requirements at a high cost or even preventing them to achieve the required cost of capital for business operations. This raises the question of whether the uneven distribution of financial funds is caused by the level of information transparency disclosed by enterprises.

Previous studies have revealed that disclosure quality and capital funds are negatively correlated (e.g. Core, 2001; Diamond and Verrecchia, 1991; Healy et al., 1999; Chen and Hsu, 2008; Mangena et al., 2016) because information disclosure sustains the stability of the cooperation relationship between enterprises and investors (Healy and Palepu, 2001). Specifically, enterprises with high level of information disclosure can lower the information asymmetry between managers and stakeholders to reduce the cost of equity capital. This phenomenon reflects a basic concept regarding information disclosure and equity capital cost (e.g. Verrechia, 2001) that has yet to be agreed upon among scholars (Botosan, 1997), some of whom have reported research results with different perspectives (e.g. Boujelbene and Affes, 2013; Espinosa and Trombetta, 2007). The inconsistent research results might be derived from the interference of other factors—such as liability—because risks induced by liabilities might not be reduced through information disclosure in capital markets.

On the basis of previous studies, problems concerning information disclosure, liability, and equity capital cost are crucial topics in financial accounting literature (e.g. Botosan, 1997; Francis et al., 2005) that have received the attention of the academia and industry. However, the relationships among information transparency, liability, and equity capital cost, particularly in emerging socialist economies such as China, have not been thoroughly verified yet. Consequently, the present study aimed to explore the influences of information transparency and

liability on the equity capital cost of enterprises in China, an emerging socialist market economy.

This study contributes to the research fields of information transparency, liability, and equity capital cost in the following two aspects. First, we directly investigated the influences of corporate information transparency on the cost of equity in an emerging socialist market economy, thus extending the research horizon of information transparency and the cost of equity. In addition, we determined that the influences of information transparency on the cost of equity vary with the capital market reforms in China. Second, we identified evidence confirming that liability ratio positively moderated the effect of information transparency on the cost of equity. This evidence indirectly verified that liability ratios in Chinese enterprises are excessively high and in turn influence their cost of equity, a finding that previous studies have seldom reported. The results of this study reflect crucial viewpoints on the relationship between information disclosure and cost of equity, providing meaningful information for subsequent policy-making and practice.

2. Background

2.1. Signalling Theory

Signalling aims to obtain information regarding capital markets to alleviate the extensive asymmetry between economic and social information (Spence, 2002). In other words, signalling theory mainly focuses on signals and feedback to examine the receiver's response. In addition, signal quality (i.e. quality of the disclosed information) contains the special implications of disseminating information such as reputation and fame (e.g. Certo, 2003) and generates positive corporate benefits (e.g. Mishra and Suar, 2010).

The signalling theory perspective aims to lower information asymmetry and avoid adverse selection. Therefore, signal validity (i.e. signal observability) is the key factor determining the influences of an enterprise's information transparency on its corporate performance. Previous studies (e.g. Diamond and Verrecchia, 1991; Healy et al., 1999; Chen and Hsu, 2008) have verified that information transparency is negatively and positively associated with cost of equity and corporate performance, respectively. Signal observability denotes that information can be easily deciphered by the receivers. For example, the financial and nonfinancial information disclosed by enterprises may not reflect on the cost of equity when the content of the disclosed information cannot be easily interpreted and compared by external stakeholders. Contrarily, the cost of equity may be influenced when the content of the disclosed financial and nonfinancial information can be easily interpreted and compared. Therefore, a high level of information transparency enables an enterprise to achieve a low cost of equity and therefore favourably demonstrate its competitive advantages. This study employed the perspective of signalling theory and relevant literature on cost of equity to construct its theoretical framework (Figure 1).
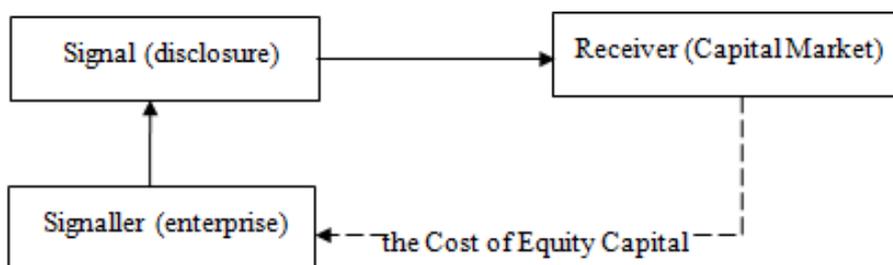

Figure 1. The connection between disclosure and the cost of equity capital

2.2. Characteristics of the Capital Market in China and the Cost of Equity Capital

The capital development process in China has generated some unique characteristics, which are different from the characteristics in most of the developed capital markets worldwide. For example, the initial goal of China's capital market development was not to elevate capital allocation efficiency but to increase the convenience of state-owned enterprises and politically-associated companies when conducting external financing. Therefore, the capital market in China may not be able to offer sufficient funds for growing or innovative companies. In addition, the insufficient number of institutional investors and financial analysts in China's stock market, along with the difficulty in acquiring the information controlled by managerial executives, frequently leads to unreasonable transaction behaviours among investors (e.g. Eccher and Healy, 2000; Yeh and Lee, 2000). Another characteristic of China's capital market is that the stock market exhibits high turnover and excessive speculation among retail investors (Bailey et al., 2009; Allen et al., 2012).

Previous studies have indicated that capital market development commonly reduces the cost of equity through improvements in liquidity supplies, external monitoring, and information disclosure and risks. (1) Liquidity supply: capital market development has increased liquidity supplies to reduce the impacts exerted by companies that depend on external financing or demand high liquidity (e.g. Raddatz, 2006; Hasan et al., 2009), thereby elevating capital allocation efficiency (e.g. Wurgler, 2000). (2) External monitoring: financial development encourages investors to search for information and facilitate the development of other external supervision measures. Therefore, strengthening external supervision (e.g. evaluation system for information transparency) can suppress management opportunism, lower agency costs, and eventually reduce the cost of equity (Healy and Palepu, 2001; Ashbaugh-Skaife et al., 2006). (3) Information disclosure: participants in the capital market (i.e. investors) encounter increasingly fierce competitions and have stronger motivations to seek for private messages and transactions (Grossman and Stiglitz, 1980; Holmstrom and Tirole, 1993). In other words, disclosure is conducive to reducing information asymmetry between managers and investors (Holden and Subrahmanyam, 1992; Foster and Viswanathan, 1993), mitigating the problem of adverse selection, and eventually reducing enterprises' cost of equity (Verrechia, 2001; Diamond and Verrechia, 1991). (4) Risks: the quality of information disclosed by enterprises is beneficial in decentralizing idiosyncratic risks (e.g. Yu et al., 2017) and in turn lowering enterprises' cost of equity.

Previous studies have indicated that information transparency is a key factor influencing the cost of equity in the capital market. For example, Prodhan and Harris (1989), Lang and Lundholm (1996), and Healy and Palepu (2001) have reported that increasing information disclosure can reduce information asymmetry and in turn lower the cost of equity of an enterprise. Francis et al. (2005) also stated that enterprises depending on external financing may expand the scope of their information disclosure because high transparency can lower the cost of equity capital. Specifically, a high level of information transparency reduces investors' uncertainty when making investing decisions, thereby decreasing the cost of equity (Clarkson et al., 1996). However, some studies have proposed opposite viewpoints. For example, Boujelbene and Affes (2013) and Espinosa and Trombetta (2007) have reported evidence disapproving the negative relationships between disclosure quality and the cost of equity capital. On the basis of the aforementioned literature, this study was conducted in the context of reforms and sustainable development in China's capital market to infer that promoting corporate information transparency can reduce information asymmetry. Accordingly, the following hypotheses are proposed.

H1: Information transparency negatively influences the cost of equity.

Liability is a critical capital cost for enterprises. For enterprises, liability is an important piece of information to investors or capital markets and is a key to whether an enterprise can meet low cost of equity. Therefore, an enterprise that depends heavily on liability financing will strive to release its corporate information (e.g. Clarkson et al., 2004; Roberts, 1992), so as to communicate with its creditors and potential investors, thereby attempting to attain low cost of equity capital. Previous studies have indicated that information disclosure level is negatively associated with the liability ratio (e.g. Brammer and Pavelin, 2008; Yu et al., 2017), whereas some studies (e.g. Roberts, 1992) have indicated that the level of information disclosure is positively associated with the liability ratio. On the basis of the aforementioned literature, we inferred that compared with information transparency, greater emphasis should be placed on the liability ratio because liability represents instant, visible, and unavoidable risks, in particular for markets such as China, where most enterprises are associated with a high ratio of liability (China Worker 2017). Therefore, we examined the cost of equity capital in Chinese enterprises to confirm whether the ratio of liability influenced corporate information transparency. H2 was proposed accordingly:

H2: An enterprise's liability ratio positively moderates the relationship between information transparency and the cost of equity.

3. Method

3.1. Data Sample

The information transparency variables employed in

this study were derived from "Annual Report on China's Public Transparency" published by *Social Science Academic Press*, which incorporated data from 2014 to 2016. However, only the data from 2014 to 2015 were selected in this study because *Social Science Academic Press* considerably modified the method and assessment of information transparency evaluation in 2016, wherein the evaluation results differed considerably compared with those in 2014 and 2015. Consequently, the data in 2016 cannot be merged with those in the preceding two years. A total of 400 observations were collected in 2014 and 2015, among which 191 observations were excluded because they contained information from unlisted companies, and 93 observations were excluded because of incomplete data; this yielded 116 observations in total. The research period spanned from 2014 to 2015, and all of the financial variables were obtained from the China Stock Market & Accounting Research (CSMAR) database.

3.2. Empirical Model

This study explored the influences of information transparency on the cost of equity capital, with (1) presenting the empirical model:

$$COC_{i,t} = \alpha_1 + \beta_1 IT_{i,t} + \beta_2 RISK_{i,t} + \beta_3 BM_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + u_{i,t} \quad (1)$$

For $i = 1, 2, ..., 161$; and $t = 2014$ and 2015

Where COC denotes the cost of equity capital. Many studies have explored models for estimating the cost of equity capital (e.g. Claus and Thomas, 2001; Gebhardt et al., 2001; Gode and Mohanram, 2003; Easton, 2004), and recent studies (e.g., Mangena et al. 2016) have indicated that the model proposed by Easton (2004) is more robust compared with other models. Therefore, the present study also employed the PEG model introduced by Easton (2004, p. 81). Specifically, COC is measured using the following equation:

$$COC = \frac{\sqrt{(EPS_2 - EPS_1)}}{P_0}$$

where EPS_2 denotes the 2-year-ahead earnings per share predicted by analysts; EPS_1 denotes the 1-year-ahead earnings per share predicted by analysts; and P_0 denotes the current share price. The PEG model possesses two key limitations. First, EPS_1 and EPS_2 must be positive numbers; and second, EPS_2 must be larger than EPS_1 (e.g. Easton, 2004; Lee et al., 2006). IT refers to the data of information transparency acquired through manually compiling information in "Annual Report on China's Companies Public Transparency". In this evaluation system, information disclosure is rated using 98 indices (items) in five dimensions (i.e., time, content, media, form, and quantity). The time dimension consists of 4 items, including the annual report release time, CSR report

release time, quantity of negative messages, and amount of corporate news. The content dimension consists of 59 items focusing mainly on environmental management, corporate governance, customer satisfaction, and employee benefits (see the Blue Book of Companies' Public Transparency − Annual Report on China's Companies' Public Transparency (2014~2015) p.7-11). The media dimension consists of 20 items, which mainly evaluate the release time of various reports (i.e., annual financial statements and CSR reports) and the online accessibility of these reports (see the Blue Book of Companies' Public Transparency—Annual Report on China's Companies' Public Transparency (2014~2015) p.11-12). The form dimension consists of 10 items. The evaluation in this dimension focuses mainly on the language used for reporting (e.g., Chinese, English) and whether each report has been audited (see Blue Book of Companies' Public Transparency—Annual Report on China's Companies' Public Transparency (2014~2015) p.13). The quantity dimension consists of 5 items, namely the amount of corporate news, amount of Baidu Search hits containing the company full name, amount of Baidu Search hits containing the abbreviated name of the company, amount of company-related data in the China Core Newspapers Full-text Database (CNKI), and amount of quantitative information disclosure. Different scales are used for different dimensions. For the time dimension, the scale ranges between −0.5 and 1. For the content dimension, 1 is used to denote information disclosure, and 0 is used to denote no information disclosure; the scale ranges between 0 and 2 for evaluating participating domestic or foreign organizations. For the media dimension, 1 is used to denote information disclosure, and 0 is used to denote on information disclosure. For the form dimension, the scale ranges between −0.2 and 1. For the quantity dimension, the scale ranges between 0.3 and 1. The total score for the 98 items in five dimensions will add up to 100; RISK refers to the market risk, with the *Beta* serving as the proxy variable; and BM refers to the book-to-market ratio, which is measured by dividing the book value of common stock at the end of the year with the market price of common stock at the end of the year. Previous studies (e.g. Fama and French, 1992; Rosenberg et al., 1985) have reported that the book-to-market ratio is one of the factors affecting stock returns. SIZE refers to company size, which is derived from the natural logarithm of the operating revenue; and LEV refers to the ratio of liability.

This study explored whether the ratio of liability moderated the relationship between information transparency and the cost of equity capital, using the model presented in (2):

$$COC_{i,t} = \alpha_1 + \beta_1 IT_{i,t} + \beta_2 LEV_{i,t} + \beta_3 (IT \times LEV)_{i,t} + \beta_4 RISK_{i,t} + \beta_5 BM_{i,t} + \beta_6 SIZE_{i,t} + u_{i,t} \quad (2)$$

where (2) incorporates an interaction term (IT×LEV) to examine how the ratio of liability moderates the effect of

information transparency on capital of equity; hence, this model was used to validate H2. If the β_3 coefficient of the interaction term is positive and significant, then H2 is supported.

4. Empirical Results

Table 1 presents the descriptive statistical results of each variable. We determined that the mean COC value is 0.111, which is consistent with the results of studies on the international and China's capital markets (e.g. Mangena et al., 2016; Kim et al., 2015). The largest and smallest values of COC are respectively 0.845 and 0.033, indicating that great variations existed in the costs of equity financing among the observed companies. The mean of information transparency (IT) is 44.815, indicating that the information transparency level of the observed companies is moderately low, a finding similar to those of previous studies (e.g. Lam and Du, 2004; Jin and Myers, 2006). The mean of market risk (RISK) is 1.065, showing that the risk level of the observed market

(i.e. China) is greater than the capital market risk in Western countries (e.g. Mangena et al., 2016). The mean book-to-market ratio (BM), company size (SIZE), and liability ratio (LVE) are respectively 0.858, 10.947, and 0.679, revealing that on average, liability accounted for approximately 67.9% of the total assets owned by the observed companies. This finding implied that the source of capital possessed by the observed companies was mainly derived from external loans, reflecting that these companies need to acquire low cost of equity capital to sustain their corporate operation.

Table 2 presents the pairwise correlation between the variables. Except for the relatively large correlation coefficients of SIZE in relation to IT (0.703), BM (0.595), and LEV (0.584), the correlation coefficients between other pairs of variables are small. The variance inflation factors of SIZE (2.984), IT (2.098), BM (1.714), and LEV (1.630) are low, further verifying the absence of collinearity among variables; this finding confirmed that all variables explored this study were independent of each other.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. deviation	Min	Max
COC	116	0.111	0.140	0.001	0.845
IT	116	44.815	18.331	9.850	77.800
RISK	116	1.065	0.236	0.437	1.644
BM	116	0.831	0.200	0.177	1.297
SIZE	116	10.947	1.005	9.065	13.291
LEV	116	0.679	0.201	0.027	0.945

Notes: COC denotes the cost of equity capital; IT denotes information transparency; RISK denotes the market risk, with the Beta serving as the proxy variable; BM denotes the book-to-market ratio; SIZE denotes company size; and LEV denotes the ratio of liability.

Table 2. Pearson correlations between variables

	COC	IT	Risk	BM	SIZE	LEV
COC	1.000					
IT	0.155[*]	1.000				
RISK	-0.182[**]	-0.381[***]	1.000			
BM	0.274[***]	0.523[***]	-0.205[**]	1.000		
SIZE	0.344[***]	0.703[***]	-0.465[***]	0.595[***]	1.000	
LEV	0.324[***]	0.467[***]	-0.262[***]	0.499[***]	0.584[***]	1.000

Note: [*]$p < .1$; [**]$p < .05$; [***]$p < .01$.

Table 3.   Regression results derived from all observations, 2014 observations, and 2015 observations

Variable	All observations	2014	2015
	Coefficient (*t*-value)	Coefficient (*t*-value)	Coefficient (*t*-value)
Constant	-0.387* (-1.857)	-0.460** (-2.120)	0.246 (0.458)
IT	-0.002* (-1.750)	-0.001 (-0.724)	-0.002* (-1.744)
RISK	-0.033 (-0.562)	0.136* (1.752)	-0.261** (-2.025)
BM	0.074 (0.934)	0.032 (0.253)	0.055 (0.480)
SIZE	0.042** (2.064)	0.035 (1.476)	0.006 (0.131)
LEV	0.127 (1.655)	0.082 (0.958)	0.212 (1.460)
Adj. R^2	0.130	0.077	0.232
F-value	4.445***	2.449**	3.995***
Obs.	116	46	70

Notes: *$p < .1$; **$p < .05$; ***$p < .01$.

Table 3 presents the effect of information transparency on the cost of equity capital. Examining all the samples simultaneously indicates that information transparency negatively and significantly affected the cost of equity capital; hence, H1 is supported. This finding indicates that the effect of information transparency on the capital market in an emerging socialist market economy is consistent with those in the capital markets worldwide. In addition, we separately analysed the effect of information transparency on the cost of equity capital using samples from 2014 and 2015 and observed a notable phenomenon. Specifically, information transparency exerted a negative and non-significant effect the cost of equity capital in 2014, yet a negative but significant effect in 2015. This difference might be attributable to the capital market reforms in China, which entailed measures such as improvements in information disclosure, external supervision, and risk prevention. The change in the effect of market risk on the cost of capital from significantly positive in 2014 to significantly negative in 2015 also verified the changes in the capital market of China.

What's more, we determined that liability ratio (LEV) positively affected the cost of equity capital (Table 3) and investigated whether this finding reflected the signal that the cost of equity capital is relatively higher when the information transparency of an enterprise is moderated by liability ratio. To find the answer, further exploration was conducted on this finding to determine whether liability ratio exerted a positive moderating effect on the influence of information transparency on the cost of equity. As shown in Table 4, the interaction term IT×LEV positively and significantly affected the cost of equity; hence, H2 is supported. The results indicate that capital markets place a greater emphasis on liability ratio than on information transparency; that is, while enterprises' information transparency is important, a greater emphasis is placed on their status of liability.

Table 4.   Moderating effect of liability ratio (LEV) on information transparency (IT) and the cost of equity capital (COC)

Variable	Coefficient	*t*-value
Constant	-0.199	-0.868
IT	-0.002*	-1.823
LEV	0.023	0.212
IT×LEV	0.077*	1.793
RISK	-0.013	-0.212
BM	0.133	1.539
SIZE	0.021**	2.123
Adj. R^2	0.138	
F-value	4.061***	
Obs.	116	

Notes: *$p < .1$; **$p < .05$; ***$p < .01$.

5. Discussion and Conclusions

This study employed the perspective of signalling theory to investigate the effect of information transparency on the cost of equity capital among enterprises in China. In addition, the moderating effect of liability on the influence of information transparency on the cost of equity capital. The empirical results indicate that information transparency negatively affected the cost of equity in 2014 and 2015. Statistical significance was observed in all samples except for those in 2014. This finding implies that capital markets under socialist market economy (i.e. China) are gradually attaching greater importance to information disclosure, indirectly suggesting that such capital markets are gradually aligning with capital markets in Western countries, becoming relatively more internationalized, and increasing the investment ratio of foreign capital (Economic Information Daily, 2018). In addition, we determined that liability ratio positively moderated the effect of information transparency on the cost of equity capital. This evidence verifies that investors in the observed capital market (i.e.

China) placed a greater emphasis on enterprises' liability status, possibly because liability could induce instant, visible, and unavoidable risks that could not be alleviated through information transparency.

This study also provided several evident findings relevant to the cost of equity capital for the academia and industry. Previous studies (e.g. Bailey et al., 2009; Allen et al., 2012; Eccher and Healy, 2000; Yeh and Lee, 2000) have considered that the insufficient number of institutional investors and financial analysts in China's stock market and the high turnover and excessive speculation among retail investors have led investors to place extra emphasis on corporate information. However, the present study determined that investors in the capital market paid attention to both the financial and nonfinancial information disclosed by enterprises. The empirical results should be of great value to corporate managers, supervisors, and decision-makers in countries with similar financial and social economic system. Finally, we determined that liability positively moderated the effect of information transparency on the cost of equity, indirectly verifying the high financial leverage among enterprises in China (Yao and Jin, 2016) that in turn affected their cost of equity capital.

This study had the following limitations. First, the research period spanned only from 2014 to 2015 (The Blue Book of Companies' Public Transparency—Annual Report on China's Companies' Public Transparency contains evaluation results regarding information disclosure among companies in China since 2014. This evaluation system has yet to become mature. Consequently, evaluation standards in the system have been revised heavily each year since 2016. This leads to inconsistency in evaluation results and impedes data sampling. Only the evaluation standards and results from 2014 and 2015 were relatively consistent; this period was therefore used as the sampling period of this study.), because the evaluation method for assessing information transparency changed considerably in 2016, and thus data after 2016 cannot be merged with those from 2014 and 2015. This limitation in data sampling was also a major research constraint of this study. Second, *Social* Sciences Academic Press is currently the only press in China that systematically and regularly publishes reports on enterprises' public *transparency in China. However, the Press only evaluates the information transparency of the top 200 large enterprises in China, and thus the research results may not be applicable to enterprises of smaller scale.*

Acknowledgements

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