



# Research on the influence of social media interaction on equity financing cost

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**ABSTRACT.** This article takes 2011-2018 Chinese A-share listed companies in Shanghai and Shenzhen as a sample, using multiple regression methods to study whether social media interaction will have an impact on the equity financing costs of listed companies in my country. We use an abnormal earnings growth model to characterize the equity financing costs of listed companies, the total number of posts on the stock bar and the number of posts read on the stock bar to characterize social media interactions. Through research, it is found that under the conditions of controlling the beta coefficient, the book-to-market value ratio of listed companies, the asset-liability ratio, the largest shareholder's shareholding ratio, the asset turnover rate, and the shareholding ratio of institutional investors, sample companies with better social media interactions have relatively low equity financing costs.

**KEYWORDS:** Social media interaction, Equity financing cost, Equity liquidity

## 1 INTRODUCTION

According to a survey released by CNNIC (China Internet Information Center), as of June 2020, China's internet population ranked first globally, reaching 940 million people, equivalent to 20% of global internet users. In this situation, the internet has become the main channel for investors to obtain information. The popularity of social media such as Tieba and Weibo has brought different investors together to share information and discuss opinions. In this situation, what kind of impact will social media interaction have on China's stock market?

Since the introduction of new asset management regulations in 2018, the financing methods and costs of listed companies in China have also undergone significant changes. The era when listed companies could easily obtain funds is gone forever, and the financing costs of companies continue to rise. Among them, compared to the cost of debt financing, the increase in equity financing costs is greater and the changes are more drastic. Therefore, this article takes the cost of equity financing of listed companies as the research object.

## 2 LITERATURE REVIEW

### 2.1 Equity Financing Costs

**2.1.1 Internal Factors Influencing Equity Financing Costs.** Aupperle et al. found through their research that while companies appear to fulfill their social responsibilities, they actually waste their human and material resources, thereby reducing their core competitiveness. The disclosure of social responsibility information is positively correlated with the cost of equity financing<sup>[1]</sup>. Richardson et al. believe that due to issues such as investor bias and sample selection bias, there is a theoretical negative correlation between social responsibility information disclosure and equity financing costs, while in practical life, the two are positively correlated<sup>[2]</sup>. Meng Xiaojun et al. found through their research on information asymmetry that there may be a non-linear U-shaped relationship between social responsibility information disclosure and equity financing costs<sup>[3]</sup>. However, the mainstream view in the academic community still holds that there is a negative correlation between social responsibility information disclosure and the cost of equity financing in theory. Verrecchia believes that the impact of social responsibility information disclosure on equity financing costs is similar to that of financial information disclosure, reducing equity financing costs by reducing information asymmetry<sup>[4]</sup>.

Botosan found through research that there is indeed a negative correlation between financial information disclosure and equity financing costs in the machinery industry, and this situation is more significant in companies with lower analyst attention<sup>[5]</sup>. Wang Wei et al. conducted a study on the information disclosure of A-share companies in the Shanghai Stock Exchange of China in 2002 and found that with the continuous improvement of information disclosure level, the information asymmetry between companies and investors decreases, resulting in a continuous decrease in their equity financing costs. At the same time, this relationship is more significant among enterprises in the communication industry<sup>[6]</sup>. Zeng Ying et al. used listed companies in the Shenzhen Stock Exchange as samples and analyzed data from 2002 by controlling for factors such as beta. They found that the information disclosure of listed companies in China is negatively correlated with their equity financing costs<sup>[7]</sup>.

**2.1.2 External factors affecting equity financing costs.** Singh and Nejaddalayeri (2004) examined the impact of internationalization on financing costs. They found that the higher the degree of internationalization of a company, the lower its financing costs<sup>[8]</sup>. Ye Chengang et al. (2015) found that the higher the external governance level of a company, the higher the quality of environmental information disclosure, and the lower the cost of equity financing<sup>[9]</sup>. Jiang Fuxiu et al. (2008) demonstrated through research that protecting the interests of corporate investors is not only beneficial for companies to engage in external financing, but also has certain practical significance in reducing their financing costs<sup>[10]</sup>. Fan Haifeng et al. (2010) found through research that securities investment funds are independent institutional investors and occupy a dominant position among institutional investors in China. Therefore, they can effectively regulate company management and reduce agency costs for companies; Its shareholding ratio is

highly negatively correlated with the company's equity financing cost and Beta coefficient<sup>[11]</sup>.

## 2.2 Social media interaction

Blankespoor et al. (2013) found through research that companies with low attention can effectively reduce the price difference between trading parties by using Twitter to forward media news, thereby improving stock liquidity. This suggests that the rational use of Twitter can reduce information asymmetry among investors<sup>[12]</sup>. Song Shuangjie et al. (2011) constructed an investor attention index using the number of Google searches and found that investor attention can affect stock prices<sup>[13]</sup>. Yu Qingjin et al. (2012) used the frequency of searching for stocks on Baidu to measure the level of attention to stocks and found that investors' attention to stocks to a certain extent can lead to upward pressure on stock prices, which is very effective in the short term<sup>[14]</sup>.

Scholars also analyzed the impact of investor attention on the stock market based on data from online interactive platforms. Hu Jun et al. (2015) conducted research and found that the information disclosed on Weibo improved the accuracy of analysts' profit forecasts<sup>[15]</sup>. He Xianjie et al. (2016) also demonstrated through research that companies that open Weibo will disclose some business information through Weibo<sup>[16]</sup>. Fang Zhou et al. (2017) conducted a study on the stock posts of the stock bar on the Oriental Wealth website, proving that the number of posts on the online stock forum has a significant impact on stock returns<sup>[17]</sup>. Finally, Jin Dehuan and Li Yan (2017) designed a model to measure investor interaction by collecting and sorting out social media data, and found that for stocks with low investor awareness, investor interaction gains have a strong impact on stock returns, and the range of corporate information dissemination will affect stock returns<sup>[18]</sup>.

## 3 RESEARCH HYPOTHESIS

The research on the impact of social media interaction on the cost of equity financing of listed companies mainly focuses on improving the liquidity of stocks as a mediator. As a typical information market, social media interaction in the securities market can affect investors' sources of information and investment choices, thereby affecting the liquidity of listed company stocks. This article explores the specific impact paths of investor interaction on stock liquidity from the following two aspects: increasing investor attention; Reduce information asymmetry among investors. Furthermore, improving the liquidity of stocks is ultimately reflected in the cost of equity financing for listed companies.

Raise investor attention. According to the theory of limited attention, it can be known that investors' attention is limited. When investors face a lot of information, increasing their focus on one thing means decreasing their focus on other things. The proportion of investors in China is imbalanced, and individual investors complete most of their investment activities. Ding and Hou (2015) pointed out that the high attention of individual investors has prompted investors to engage in trading, significantly increasing

the number of shareholders in listed companies and enhancing the liquidity errors of their stocks. Therefore, we have reason to speculate that companies with good social media interactions are highly likely to receive widespread attention from investors, thereby improving the liquidity of their stocks.

Reduce information asymmetry among investors. There are two major categories of investors in China: individual investors and institutional investors, and there is a serious problem of information asymmetry between the two. Individual investors mainly collect information about listed companies through online tools, such as company announcements, media reports, etc; Institutional investors can obtain information through on-site inspections and specialized research of listed companies, and the ways to obtain information are more diverse. This also leads to significant information asymmetry between institutional investors and individual investors.

At present, there are a large number of individual investors in China's securities market. However, many of these individual investors lack the necessary financial knowledge and understanding of the securities market. Through communication on social media, it is beneficial for investors to obtain the information they need and enhance their corresponding financial knowledge. Therefore, through social media interaction, information asymmetry can be reduced, thereby improving stock liquidity.

In summary, we have analyzed that social media interaction can enhance the liquidity of listed company stocks. Generally speaking, for stocks with stronger liquidity, the lower the expected return required by investors, the lower the cost of equity financing for the company. Based on the above analysis, we propose the following hypothesis:

Hypothesis H1: Listed companies with good social media interaction have lower equity financing costs;

Hypothesis H2: Compared to state-owned enterprises, social media interaction has a greater impact on non-state-owned enterprises;

Hypothesis H3: Listed companies with better social media interaction have higher stock liquidity;

Hypothesis H4: Stock liquidity plays a mediating role in the relationship between social media interaction and equity financing costs.

## **4 RESEARCH DESIGN**

### **4.1 Sample Selection and Data Sources**

According to the model requirements design, the research sample for this article is A-share listed companies in China's Shanghai and Shenzhen stock markets from 2011 to 2018. The data used to calculate equity financing costs in this article is from the CSMAR database; The data used to measure social media interaction comes from CNRDS, while the remaining data comes from the CSMAR database. We processed the initial data as follows to avoid the impact of abnormal samples: (1) excluding financial listed companies; (2) Excluding samples that were ST or \* ST during the sample period; (3) Exclude company samples with missing or omitted data. After the above processing, 515 listed companies met the above requirements and 4120 sample observations were obtained.

## 4.2 Variable Measurement

### 4.2.1. Cost of equity financing.

There has been no consensus at home and abroad on which model to use to measure the cost of equity financing. Li Shu et al. found that the PEG abnormal earnings growth model is more suitable for the actual situation in China and has more accurate evaluation and prediction capabilities for listed companies in China. Therefore, based on previous research and the specific situation of this article, this article mainly follows Easton's approach and uses the PEG model to estimate the equity financing cost of listed companies in China. The specific calculation formula is as follows:

$$COC = \sqrt{\frac{eps_{t+2} - eps_{t+1}}{P_t}}$$

Where,  $P_t$  is the company's price per share at the end of period  $t$ ,  $eps_{t+1}$  is the average earnings per share estimated by analysts for period  $t + 1$ , and  $eps_{t+2}$  is the average earnings per share estimated by analysts for period  $t + 2$ . Since analysts' expectations of periods  $t + 1$  and  $t + 2$  May come from before period  $t$ , in order to ensure the accuracy of the expectations, we forecast the average earnings per share of periods  $t + 1$  and  $t + 2$  using the period  $t$  price per share as the standard, and require  $eps_{t+2} > eps_{t+1}$ .

### 4.2.2 Social media interaction.

This article selects data from the stock bar article on the Chinese research data service platform to measure social media interaction, mainly for the following reasons:

1. The data volume is large and relatively accurate, and the data in CNRDS covers the vast majority of stock bar forums in China;
2. Strong data traceability, which can be traced back to all relevant article statistics after 2009;
3. The data classification is clear, and the stock bar article statistics clearly list the total number of posts related to each listed company, positive posts, negative posts, neutral posts, and reading numbers, for easy analysis.

### 4.2.3 Adjusting variables and mediating variables.

#### 1. Adjusting variables

According to the data in the CSMAR database, listed companies are divided into state-owned and non-state-owned enterprises based on their equity nature.

#### 2. Mediating variables

This article selects the average annual turnover rate of individual stocks as an intermediary variable to measure the liquidity of stocks. Generally speaking, the higher the average annual turnover rate of individual stocks, the stronger the liquidity of the company's stock.

#### 4.2.4 Control variables.

Based on existing literature on the cost of equity financing, this article controls for the following variables: the beta coefficient reflects the performance of a stock relative to the stock market, the logarithm of a company's total assets measures the size of the company, the book to market ratio BM of the company, the asset liability ratio Lev of the company measures the ability of the company to use funds provided by creditors for business activities, the first largest shareholder's shareholding ratio The Asset turnover of the shares of listed companies reflects the management quality and utilization efficiency of all assets of the enterprise, the size of the board of directors, and the shareholding ratio of institutional investors.

The specific definitions of the regression model variables used in this article are shown in the Table 1.

**Table 1.** Variable Definition

Variable Type	Variable Symbol	Variable Definition
Explained Variable	COC	cost of equity capital
explanatory variable	allpost	The logarithm of the total number of stock bar posts
	reads	Logarithmic reading volume of stock bar posts
Mediating variable	turnover	Annual trading shares/average number of outstanding shares
control variable	beta	Covariance of return on risky assets and return on assets of market portfolio
	first	The share of company stock held by the largest shareholder
	turn	Operating income/total assets
	size	The logarithm of the company's total assets
	BM	Net assets per share/stock price per share
	Lev	The ratio of the company's total liabilities to total assets
	Bsize	Number of directors
	ins	Overall shareholding ratio of institutional investors

### 4.3 MODEL DESIGN

**4.3.1 Basic equation setting.** This article will mainly use the method of multiple regression analysis to study the relationship between social media interaction and equity financing costs of listed companies in China. The basic form of the adopted multiple regression model is as follows:

$$Y = \alpha_0 + \alpha_1 INTER_{it} + \alpha_2 CONTROL_{it} + \varepsilon$$

Among them, Y is the dependent variable, INTER is the explanatory variable, and Control is the control variable. According to the above indicators in this article, there are mainly two regression models (1) and (2):

$$COC = \alpha_0 + \alpha_1 allpost_{it} + \alpha_2 beta_{it} + \alpha_3 first_{it} + \alpha_4 turn_{it} + \alpha_5 size_{it} + \alpha_6 BM_{it} + \alpha_7 Lev_{it} + \alpha_8 Bsize_{it} + \alpha_9 ins_{it} + \varepsilon_{it} \quad (1)$$

$$COC = \alpha_0 + \alpha_{1i}reads_{it} + a_2beta_{it} + a_3first_{it} + a_4turn_{it} + a_5size_{it} + a_6BM_{it} + a_7Lev_{it} + a_8Bsize_{it} + a_9ins_{it} + \varepsilon_{it} \quad (2)$$

In the model, COC is the core dependent variable, while allpost and reads are the explanatory variables, representing the total number of posts and reads per year for each stock in the stock bar.

**4.3.2 Setting of Group Regression Equations.** In order to test the moderating effect of property rights, this article establishes four equations (3), (4), (5), and (6) based on whether a listed company is state-owned:

1.soe=1 (State owned enterprise group)

$$COC = \alpha_0 + \alpha_{1i}allpost_{it} + a_2beta_{it} + a_3first_{it} + a_4turn_{it} + a_5size_{it} + a_6BM_{it} + a_7Lev_{it} + a_8Bsize_{it} + a_9ins_{it} + \varepsilon_{it} \quad (3)$$

$$COC = \alpha_0 + \alpha_{1i}reads_{it} + a_2beta_{it} + a_3first_{it} + a_4turn_{it} + a_5size_{it} + a_6BM_{it} + a_7Lev_{it} + a_8Bsize_{it} + a_9ins_{it} + \varepsilon_{it} \quad (4)$$

2.soe=0 (Non state-owned enterprise group)

$$COC = \alpha_0 + \alpha_{1i}allpost_{it} + a_2beta_{it} + a_3first_{it} + a_4turn_{it} + a_5size_{it} + a_6BM_{it} + a_7Lev_{it} + a_8Bsize_{it} + a_9ins_{it} + \varepsilon_{it} \quad (5)$$

$$COC = \alpha_0 + \alpha_{1i}reads_{it} + a_2beta_{it} + a_3first_{it} + a_4turn_{it} + a_5size_{it} + a_6BM_{it} + a_7Lev_{it} + a_8Bsize_{it} + a_9ins_{it} + \varepsilon_{it} \quad (6)$$

**4.3.3 Mediation effect equation setting.** In order to test the mediating effect of stock liquidity on equity financing cost and social media interaction, equation (1) is set together and equation (7) and equation (8) are established:

$$COC = \alpha_0 + \alpha_{1i}allpost_{it} + a_2beta_{it} + a_3first_{it} + a_4turn_{it} + a_5size_{it} + a_6BM_{it} + a_7Lev_{it} + a_8Bsize_{it} + a_9ins_{it} + \varepsilon_{it} \quad (1)$$

$$turnover = \alpha_0 + \alpha_{1i}allpost_{it} + a_2beta_{it} + a_3first_{it} + a_4turn_{it} + a_5size_{it} + a_6BM_{it} + a_7Lev_{it} + a_8Bsize_{it} + a_9ins_{it} + \varepsilon_{it} \quad (7)$$

$$COC = \alpha_0 + \alpha_{1i}allpost_{it} + a_2turnover_{it} + a_3beta_{it} + a_4first_{it} + a_5turn_{it} + a_6size_{it} + a_7BM_{it} + a_8Lev_{it} + a_9Bsize_{it} + a_{10}ins_{it} + \varepsilon_{it} \quad (8)$$

## 5 EMPIRICAL ANALYSIS

### 5.1 Descriptive Statistics

The following Table 2 presents the basic statistical information of 4120 observations from the entire sample:

**Table 2.** Full Sample Descriptive Statistics Table

variable	N	mean	sd	min	p25	p50	p75	max
COC	4120	0.113	0.0500	0.00800	0.0870	0.109	0.133	0.225
R_e	4120	0.0990	0.0210	0.0210	0.0870	0.100	0.112	0.165
allpost	4120	8.766	0.898	6.513	8.205	8.814	9.376	10.84
reads	4120	16.05	1.055	13.50	15.37	16.14	16.81	18.35
turnover	4120	1.710	1.322	0.132	0.775	1.321	2.256	6.860
Lev	4120	0.461	0.212	0.0590	0.293	0.454	0.621	0.937
size	4120	23.14	1.647	20.49	21.92	22.85	23.96	28.51
Bsize	4120	9.183	2.077	5	8	9	10	17
turn	4120	0.682	0.462	0	0.377	0.590	0.846	2.527
first	4120	36.23	15.48	9.272	23.55	34.98	46.19	75.46
ins	4120	4.239	7.912	0	0	0	5.299	35.56
BM	4120	0.300	0.200	0.100	0.200	0.300	0.400	1.200
beta	4120	1.138	0.286	0.435	0.953	1.146	1.308	1.944

The main explanatory variable COC and R\_e used in the robustness test are positive indicators. The smaller the value of these two indicators, the lower the equity financing cost of listed companies.

The total number of posts, allpost, and the number of posts read were logarithmic. From the above table, we can see that there is little difference between the total number of posts and the minimum and maximum number of reads of different stocks, which indicates that each stock has received a lot of discussion in the stock bar and good social media interaction. Meanwhile, the number of posts read far exceeds the total number of posts, indicating that the data is valid.

The standard deviation of average annual turnover of individual shares in the intermediate variable was 1.322, which meant that the stock liquidity of different companies varied greatly.

## 5.2 Regression results and analysis

**5.2.1 Analysis of full-sample regression results.** Without grouping, the cost of equity financing is used as the dependent variable, the total number of stock bar posts and the number of stock bar post readings are used as the explanatory variables, and beta coefficients are added as control variables to conduct a full sample regression. The following Table 3 shows the regression results of equation (1):

**Table 3.** Full sample regression results

VARIABLES	(1)		VARIABLES	(2)	
	COC	COC		COC	COC
allpost	-0.112*** (0.00646)	-0.0571*** (0.00869)	reads	-0.113*** (0.00489)	-0.0747*** (0.00694)
Lev		0.330*** (0.0630)	Lev		0.306*** (0.0624)



size		0.0135	size		0.0244*
		(0.0138)			(0.0135)
Bsize		0.00170	Bsize		0.000308
		(0.00510)			(0.00504)
turn		0.231***	turn		0.213***
		(0.0285)			(0.0283)
first		0.00110	first		0.000699
		(0.00101)			(0.000993)
ins		0.00732***	ins		0.00544***
		(0.000752)			(0.000775)
BM		-48.80***	BM		-38.16***
		(3.322)			(3.520)
beta		0.0467**	beta		0.0446**
		(0.0200)			(0.0193)
Constant	-1.260***	-2.351***	Constant	-0.424***	-1.876***
	(0.0568)	(0.315)		(0.0786)	(0.312)
Observations	4,120	4,120	Observations	4,120	4,120
Number of stkcd	515	515	Number of stkcd	515	515
R-squared	0.077	0.166	R-squared	0.130	0.183

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

First, the explained variable equity financing cost COC and the explanatory variable stock bar post total allpost are put into the regression. It is found that the coefficient of allpost is -0.112, and the fitting value of R2 is 7.7%, indicating that the fitting degree is average. Our hypothesis has been preliminarily verified. Further, control variables such as asset-liability ratio were added into regression equation (1). We found that the coefficient of allpost decreased to -0.0571, but the fitting value of R2 increased to 16.6%, indicating a good degree of fitting. There is a significant negative correlation between the total number of stock bar posts and the cost of equity financing at the confidence level of 1%. The research hypothesis H1 in this paper has been preliminarily verified.

According to the results shown in the table above, we can find that in the regression equation (2), the coefficient of the number of reads in the posts of Lu Ba is -0.0747, and the fitting value of R2 is 18.3%, indicating a good degree of fitting. In addition, the number of stock bar posts read and the cost of equity financing are significant at 1% confidence level, indicating that the more the number of stock bar posts read, the lower the cost of equity financing. Thus, it is proved that the research hypothesis H1 in this paper is valid.

**5.2.2 Group regression analysis.** According to whether the property rights of listed companies are state-owned or not, they are divided into two groups, and the cost of equity financing is used as the dependent variable. The total number of stock bar posts and the number of stock bar post readings are used as the explanatory variables for multiple regression analysis. The following Table 4 shows the regression results of equations (3), (4), (5), and (6):

**Table 4.** Regression results of grouping different property rights

VARIABLES	(3) COC	(5) COC	VARIABLES	(4) COC	(6) COC
allpost	-0.0429*** (0.0135)	-0.0703*** (0.0116)	reads	-0.0665*** (0.0105)	-0.0825*** (0.00937)
Lev	0.221** (0.103)	0.339*** (0.0830)	Lev	0.216** (0.102)	0.301*** (0.0823)
size	0.00949 (0.0218)	0.0231 (0.0186)	size	0.0173 (0.0214)	0.0337* (0.0181)
Bsize	-0.000340 (0.00698)	0.000157 (0.00775)	Bsize	-0.00127 (0.00691)	-0.00216 (0.00768)
turn	0.264*** (0.0460)	0.201*** (0.0367)	turn	0.242*** (0.0458)	0.186*** (0.0364)
first	0.00160 (0.00147)	0.00142 (0.00149)	first	0.00132 (0.00146)	0.000928 (0.00147)
ins	0.0105*** (0.00118)	0.00504*** (0.000996)	ins	0.00834*** (0.00123)	0.00330*** (0.00102)
BM	-45.78*** (6.079)	-49.11*** (4.019)	BM	-35.39*** (6.318)	-38.31*** (4.324)
beta	0.0830*** (0.0303)	0.00934 (0.0268)	beta	0.0874*** (0.0295)	-8.12e-05 (0.0259)
Constant	-2.499*** (0.525)	-2.302*** (0.412)	Constant	-1.975*** (0.527)	-1.793*** (0.405)
Observations	1,929	2,191	Observations	1,929	2,191
Number of stkcd	257	285	Number of stkcd	257	285
R-squared	0.164	0.179	R-squared	0.179	0.196

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

We divide listed companies into state-owned enterprises and non-state-owned enterprises, and use group testing to test the moderating effect. It can be seen that there is a significant negative correlation between the total number of stock bar posts, the number of stock bar posts read, and the cost of equity financing at a 1% confidence level in both state-owned and non-state-owned enterprises, and it passes the poll test. Therefore, compared to state-owned enterprises, social media interaction has a stronger impact on non-state-owned enterprises, and the reduction in equity financing costs is greater.

The reason for this is that in a fully competitive market environment, non-state-owned enterprises and state-owned enterprises are different and do not have intangible guarantees. So investors can only make judgments based on publicly available information of the company. Therefore, in the process of non-state-owned enterprises engaging in social media interaction, the motivation of the company and investors enhances the effectiveness of social media interaction, and has a greater impact on the

cost of equity financing. At this point, it has been proven that the H2 hypothesis in this article is valid.

**5.2.3 Test of mediating effect.** Introducing the average annual turnover rate of individual stocks of listed companies as an intermediary variable to measure the liquidity of listed company stocks, and testing the impact of social media interaction on the equity financing cost of listed companies. The following Table 5 shows the regression results of simultaneous equations (1), (7), and (8):

**Table 5.** Regression results of stock liquidity intermediation effect

VARIABLES	(1) COC	(7) turnover	(8) COC
allpost	-0.0571*** (0.00869)	0.834*** (0.0265)	-0.0434*** (0.00980)
turnover	* *	* *	-0.0164*** (0.00547)
Lev	0.330*** (0.0630)	-0.515*** (0.192)	0.322*** (0.0630)
size	0.0135 (0.0138)	-0.732*** (0.0422)	0.00150 (0.0144)
Bsize	0.00170 (0.00510)	0.00783 (0.0155)	0.00183 (0.00509)
turn	0.231*** (0.0285)	-0.269*** (0.0868)	0.226*** (0.0285)
first	0.00110 (0.00101)	0.0152*** (0.00306)	0.00135 (0.00101)
ins	0.00732*** (0.000752)	-0.0106*** (0.00229)	0.00715*** (0.000754)
BM	-48.80*** (3.322)	183.5*** (10.12)	-45.78*** (3.466)
beta	0.0467** (0.0200)	0.296*** (0.0609)	0.0516** (0.0200)
Constant	-2.351*** (0.315)	10.26*** (0.960)	-2.182*** (0.320)
Observations	4,120	4,120	4,120
Number of stkcd	515	515	515
R-squared	0.166	0.396	0.168

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

We used stepwise regression to test the mediating effect. First, the coefficient c of the total number of stock bar posts in equation (1) passes the test and shows a significant negative correlation with equity financing cost at the level of 1%, which conforms to

hypothesis H1. Secondly, the total number of stock bar posts coefficient  $a$  in equation (7) and the stock liquidity coefficient  $b$  in equation (8) are both significant at the 1% level, where coefficient  $a$  indicates that the greater the total number of stock bar posts, the stronger the liquidity of the stock. This is consistent with the H3 hypothesis of this paper. Coefficient  $b$  indicates that the stronger the stock liquidity, the lower the equity financing cost of the listed company, which is in line with the above assumptions. The last step is to check the coefficient  $c'$ . The coefficient  $c'$  of the total number of posts in equation (8) is also significant at the 1% level. Therefore, we preliminarily draw a conclusion that the mediating effect of stock liquidity of listed companies is significant, that is, social media interaction affects the equity financing cost of listed companies through stock liquidity.

Next, we use bootstrap test to further test this mediation effect. The following Table 6 shows the regression results of 1000 self-sampling conducted by bootstrap:

**Table 6.** Results of bootstrap test on the intermediation effect of stock liquidity

	Observed		Bootstrap			
	Coef.	Bias	Std. Err.	[95% Conf. Interval]		
_bs_1	-0.00587973	0.000061	0.00347583	-0.0130574	0.0007618	(P)
				-0.0133524	0.0005552	(BC)
_bs_2	-0.05377319	-0.0003376	0.00900286	-0.0716105	-0.0368069	(P)
				-0.0703151	-0.036073	(BC)

(P) percentile confidence interval

(BC) bias-corrected confidence interval

It can be seen from the results that the non-parametric percentile position interval of direct effect  $bs_2$  does not include 0, indicating that stock liquidity plays an intermediary role in the relationship between social media interaction and equity financing cost. This is consistent with the H4 hypothesis of this paper.

### 5.3 Robustness Test

The above regression in this paper is mainly to estimate the cost of equity financing of listed companies through PEG model, and to explore the impact of social media interaction on the cost of equity financing of listed companies. In the robustness test, we use CAPM—capital asset pricing model to measure the cost of equity financing. After replacing COC with  $R_e$  in the regression model, the regression coefficient symbols of the main explanatory variables did not change, which proves that the regression results in this paper have high robustness.

## 6 CONCLUSION

This article selects A-share listed companies in the Shanghai and Shenzhen stock markets of China from 2011 to 2018 as samples, selects equity financing costs as the dependent variable, and social media interaction as the explanatory variable. The study

found that listed companies with better social media interaction will enhance their stock liquidity, ultimately resulting in a decrease in equity financing costs for listed companies.

Stock liquidity plays a mediating role in the relationship between social media interaction and equity financing costs. Companies with better social media interaction have stronger stock liquidity and lower equity financing costs. The impact of social media interaction on the cost of equity financing for listed companies is mainly achieved by affecting the liquidity of the company's stocks.

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