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Microblog publicity and IPO underpricing

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ABSTRACT

Based on many cases of publicity using social media in the market, this paper empirically examines the damage of microblog publicity to market efficiency by using the sample of IPO companies. The results show that the companies posting microblogs during the IPO publicity period have higher IPO underpricing, and the more the number of microblogs, the richer the content, the higher the proportion of microblogs in the operating activities, the higher the IPO underpricing. These relationships are stronger in the enterprises with higher degree of information asymmetry and management valuing social media more. Furthermore, microblogs posted during the IPO period mainly influence investor sentiment, especially small investors. In addition, the short-term stock market performance of the companies posting microblogs is significantly worse. This paper provides a theoretical basis for standardizing the information disclosure behavior of listed companies using social media.

KEYWORDS

Microblog; publicity; IPO underpricing; investor sentiment

1. Introduction

The development and popularity of mobile Internet has brought about the rapid development of social media in recent years, making its influence grow day by day. For example, since Sina microblog's launch in 2009, its monthly active user base has grown, reaching 573 million users in December 2021, with mobile accounting for 95% of that number.¹ Behind this huge potential for impact, however, the market suffers from a double-edged sword effect. On the one hand, with the rise of social media, it not only makes information more likely to be noticed and known by users, but also improves the efficiency and timeliness of information dissemination. On the other hand, in the Chinese capital market, where information asymmetry is a serious problem, the reach of social media can be easily exploited by relevant stakeholders. By creating hotspots and propaganda, the cognitive judgement of market participants can be easily influenced, which can easily lead to the loss of market efficiency if not careful. Against this background, research on the relationship between social media and capital markets has gradually emerged in recent years. In general, current research focuses on the positive role of social media in capital markets, including its ability to alleviate information asymmetry (Blankespoor et al., 2014) and play an external governance role (Ang et al., 2021),

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among other advantages. At the same time, however, according to a series of studies represented by Jung et al. (2018), social media may also have some negative effects on capital markets, which in turn may easily give rise to more serious problems such as information asymmetry. It is not difficult to find the fact that social media are also being used improperly in the capital market, inducing negative phenomena to market participants. Once not regulated and managed in a timely manner, it may lead to serious disruption of the market order. In view of this, this potential problem of social media inevitably deserves our attention. Therefore, in order to understand the impact of social media on the capital market in a comprehensive and objective way, we need to explore the positive and negative aspects of the issue.

In the Chinese capital market, the ever-popular phenomenon of IPO speculation has long been criticised, which has been considered closely related to market speculation. IPO companies tend to proactively manage media with the aim of raising more capital and paving the way for share price performance on IPO day. Compared to traditional media, social media such as Sina microblog is fully controlled by the firm. In addition, with traditional media now declining, social media reach a large number of users, which can disseminate information in a timely, accurate and efficient manner using advanced technology. Therefore, listed companies are likely to use microblog and other social media to promote the IPO and attract market attention, and may even exaggerate the facts and cover up their own problems. Thus, taking the IPO underpricing level of listed companies as the starting point, this paper investigates how deliberate propaganda by companies with the help of microblog affects the market perceptions, which can help us to understand whether social media misuse has a negative impact on the capital market. On this basis, the main research questions are as follows: Does the deliberate posting of microblog during the IPO promotion period increase IPO underpricing? Through what channels? And what will be the market performance after the IPO?

In response to the above questions, listed companies that conducted IPOs in Shanghai and Shenzhen A-share markets between 2010 and 2016 were selected as the research sample. According to the empirical results, companies that publish microblogs during the IPO promotion period have higher IPO underpricing, and the more microblogs published, the richer the content of microblogs, and the higher the proportion of microblogs in the business activities category, the higher the corresponding IPO underpricing. At the same time, companies with higher information asymmetry and whose management places more emphasis on social media can increase their IPO underpricing more significantly if they use microblog to disseminate information during the IPO promotion period. In addition, the microblogs released by listed companies during the IPO promotion period mainly improves IPO underpricing by influencing investors' sentiment, with the main target of influence being small investors; and moreover, companies that deliberately publish microblogs during the IPO publicity period have significantly weaker post-IPO market performance than companies that do not publish microblogs.

As for the possible theoretical contributions of this paper, the author believes that they are mainly reflected in the following three aspects: ① Since this paper systematically studies the adverse effects of social media on capital markets from the perspective of corporate induced investors, it earlier verifies the improper use of microblogs in practice. ② By using high-frequency trading data, this paper more accurately measures the responses of different types of investors to social media messages, increasing the

persuasiveness of the conclusion that social media mainly affects small and medium-sized investors. ③ By adding to the factors influencing IPO underpricing from the perspective of social media, this paper enriches the exploration and understanding of IPO underpricing as a capital anomaly in the Internet era in both academic and practical circles.

The next parts of this paper are organised as follows. The first part serves as the introduction part; the second part is the literature review and related hypotheses; the third part is the research design, including the use of models and variable description; the fourth part is the empirical results and analysis of the article; the fifth part is the related robustness test; the last part is the research conclusion and revelation of the whole article.

2. Literature review and research hypothesis

2.1. *Microblog publicity of listed companies and IPO underpricing*

IPO underpricing refers to the closing price of IPO stocks on the first day of listing is much higher than the issue price. As an anomaly in the capital market, the causes of excessive IPO underpricing have been a hot topic of research in academia. This phenomenon is particularly evident in the Chinese capital market where IPO speculation is serious, and the problem of high IPO underpricing is worthy of deeper consideration. The current mainstream research findings have explained this phenomenon from three perspectives. ① Information asymmetry perspective. IPO underpricing emerges due to information asymmetry among three types of IPO participants: issuing companies, underwriters, and investors; the existing Signal Theory (Allen & Faulhaber, 1989), Winner's Curse (Rock, 1986), and Agency Theory (Baron, 1982) are the classical theories that describe IPO underpricing. ② Behavioural finance perspective. Investors are concerned about the important factors that influence IPO underpricing (Da et al., 2011). Under IPO pricing constraints, investors' 'excessive extrapolation' (Barberis et al., 2018) behavioural bias can still breed irrational investment behaviour of blindly chasing after the IPO (J.F. Zhang et al., 2020). Subject to divergent investor opinions and arbitrage restrictions, optimistic investors' opinions are more likely to be reflected in stock prices (Miller, 1977), and optimism enhances speculative tendencies (Baker & Wurgler, 2007), ultimately raising IPO depression. ③ Institutional perspective. Instead of discouraging initial IPO speculation, the first-day IPO price limit policy stimulates investors to 'speculate on IPOs' (Wei et al., 2019). In addition, economic policy uncertainty reduces investors' recognition of firm value to a greater extent, which ultimately manifests itself in lower IPO underpricing (Zhu et al., 2021). In general, information asymmetry theory explains IPO underpricing mainly from the perspective of underpricing of the issue, i.e. the primary market; while behavioural finance theory explains IPO underpricing mainly from the perspective of high first-day closing price, i.e. the secondary market; IPO policies, depending on the focus, may combine these two perspectives in explaining IPO underpricing, and then analyse the impact on IPO underpricing.

In general, positive media coverage of proposed IPOs increases IPO depression by influencing investor sentiment (Bajo & Raimondo, 2017; J. Huang & Chen, 2013). If we pursue the reasons why the media give a lot of (positive) coverage to some IPO companies, apart from the fact that the media are attracted by certain qualities of the company, another important point is the firm's proactive media management, whose main motives

can be attributed to obtaining more funds raised and preventing IPO breakdowns. ① On the aspect of raising capital. On the one hand, media publicity helps to disseminate information and alleviate information asymmetry between companies and investors to make stock pricing fairer; it helps companies to attract investors without the need for concessional gains on issue pricing. On the other hand, through media publicity prior to the IPO, firms can come to attract the attention of investors (especially individual investors) and incite their optimism, which in turn leads to higher secondary market trading prices; IPO firms can also anticipate and take advantage of investors' overreaction by pricing higher in order to raise more funds (L. Zhang & Zhang, 2017). ② On the aspect of avoiding IPO breakdowns. IPO breakdowns not only have a direct negative impact on the image of listed companies, but also affect the issuer's future refinancing, thus limiting the firm's development (Shao et al., 2018). At the same time, since IPO breakdowns can also damage the reputation of underwriters and the losses of breakdowns will also be directly borne by investors who subscribe for new shares, it will inevitably affect investors' investment confidence. In addition, issuers and underwriters benefit from a high IPO price, which may depend to some extent on the participation of connected (institutional) investors and the 'sedan chair' offer (C.Y. Wang & Wu, 2015). Given the above, firms have a strong incentive to use the media to generate publicity, which helps to boost secondary market share prices as much as possible and prevent IPO breakdowns. The obvious fact is that the traditional media are still deliberately promoting and luring investors during corporate IPOs (M.Z. Wang & Li, 2016). Therefore, it is not difficult to conclude that social media directly controlled by the firm is more likely to have similar pitfalls.

Indeed, the spread of technology has led to the rapid growth of social media in recent years, and with it, research on its relationship with capital markets has begun to emerge in recent years. According to studies conducted by domestic and foreign scholars, microblog sentiment can predict the price or trading of stock indices (Bollen et al., 2011; Cheng & Lin, 2013), and the overall comments of individual Twitter users on listed companies are good predictors of corporate earnings and stock price returns (Bartov et al., 2018). This shows the predictive role of social media on stock prices and trading. In addition, social media plays an important role in the process of information dissemination, evidenced by that microblog can reduce information asymmetry and make the market react more fully and reasonably to corporate financial information (Blankespoor et al., 2014). The foregrounding behaviour of entrepreneurs publishing microblogs can mitigate the level of information asymmetry and enhance corporate value (Sun et al., 2021). However, a series of marketing scandals have brought about a growing awareness of the problems associated with the misuse of social media. A study represented by Jung et al. (2018) found that there was significant selective disclosure behaviour of firms in disclosing financial information on social media; when faced with bad surplus news, the likelihood of posting surplus announcements on Twitter was smaller and less numerous; Jia et al. (2020) found that the spread of most M&A rumours that did not materialise afterwards on Twitter led to stock price movements and distorted market price discovery, thus suggesting that social media is a 'double-edged sword'. In this paper, the potential negative effects of inappropriate use of social media are explored, focusing on the impact of companies' spontaneous social media management practices on capital markets. An IPO, as a major project, involves a lot of effort on the part of the firm, and the firm is keen to raise more funds and boost the secondary market share price for its own benefit, that of the underwriters

and the related investors. Therefore, corporate executives are also motivated to make corresponding publicity and stock promotion during the IPO publicity period, which not only makes the role of microblog in alleviating information asymmetry limited, but may mainly increase the irrationality of investors; and the resulting overreaction will thus enhance the degree of IPO underpricing. In summary, this paper proposes the following first hypothesis:

H1: Companies can significantly increase IPO underpricing by using microblog publicity during the IPO publicity period.

2.2. Microblog publicity and IPO underpricing of listed companies with different characteristics

Under the circumstances of low level of firm information disclosure and high information asymmetry between companies and investors, ordinary investors seriously lack channels and methods to understand corporate information. Since microblogs published by such IPO companies inevitably cater to the information needs of general investors, they are more likely to be seen by investors and attract greater investor attention; investor attention is an important bridge between market information and investor behaviour (Y. Huang & Zhang, 2020; Zong et al., 2020). In addition, investors' lack of knowledge about such companies makes them susceptible to the influence of microblog publicity and to hot topic compulsion, which in turn has a significant marginal effect on market sentiment, and stronger market sentiment contributes to higher IPO underpricing (Song & Wang, 2016). From this, it can be concluded that microblog publicity is supposed to have a greater marginal effect on firms with a higher degree of information asymmetry compared to firms with fuller information disclosure. Combined with H1, the following hypotheses are proposed in this paper:

H2a: The higher the degree of information asymmetry, the more the IPO underpricing can be improved by using microblog during the IPO promotion period.

At the same time, the importance that executives of IPO firms attach to social media also exerts a significant influence on the effectiveness of microblog during the IPO period. In this research, the management includes the board of directors, supervisory board, and senior management. It is believed that when the management is more familiar with and attaches more importance to microblog, the more willing the firm is to use microblogs to publish information and the more frequently it publishes microblogs; on the other hand, microblogs are more acceptable to Internet users and investors because of their richer content and more concise language style. Since the specificity of information on social media platforms affects investor perceptions (ZhJ.X. Zhang et al., 2021), the combination of both factors makes this type of companies more effective in using microblogs to disseminate firm listing information. According to He et al. (2016), the younger the members of the board, the more likely the firm is to have a microblog to disseminate more information. Based on this logic, this paper argues that the younger the firm's management attaches more importance to microblogs at the time of IPO; thus, they

should have a better publicity effect by posting microblogs and thus be more able to influence investors' decisions, and therefore, this paper proposes the following hypothesis:

H2b: In companies where the management pays more attention to social media, the more the IPO underpricing can be improved by using microblog during the IPO promotion period.

2.3. Channels through which microblog publicity of public companies affects IPO underpricing

Compared with traditional media, social media platforms such as microblogs have advantages in terms of self-selection of information content, ease and cost-effectiveness of information dissemination, and the breadth, timeliness and relevance of information dissemination, and thus can well meet the information management needs of IPO companies. The firm's induced tendencies can also be better embedded in the positive microblog content released, thus making it easier to guide investor sentiment and increase the level of irrationality among investors. Further, from a behavioural finance perspective, more optimistic investors' beliefs about future cash flows and investment risks are more unrealistic and tend to produce systematic biases in stock value judgments; moreover, with less information about IPO stocks prior to their listing, more divergent investor opinions, and arbitrage restrictions, more elevated investor sentiment can lead to higher IPO depression (Baker & Wurgler, 2007; song & Wang, 2016; Yu et al., 2015). On this basis, the characteristic that individual investors tend to be at an information disadvantage (Xue & Dou, 2015) makes them inclined to use online media as a source of information for decision making (Gong & Zhang, 2021). Individual investors not only have less expertise and poor analytical skills (Franco et al., 2007), but also have a serious speculative mentality and immature investment philosophy (Cheng & Lin, 2013); in addition, the Chinese stock market is characterised by retail investors. Therefore, the large and highly irrational group of small investors provides realistic support for microblog propaganda to influence IPO underpricing through the channel of investor sentiment. In summary, this paper proposes the following hypotheses:

H3: Listed companies use microblog publicity during the IPO publicity period to increase IPO underpricing mainly through influencing investor sentiment.

2.4. Microblog publicity of listed companies and post-IPO market performance

Through empirical studies, J. Huang and Chen (2013) find that media coverage influences investor sentiment and leads to high IPO depression. However, the gradual rationalisation of investors leads to differential post-IPO market performance. Z.X. Zhang and Wu (2021) have similar findings for positive media coverage, arguing that favourable reports affect investor sentiment and make them overreact. Compared with traditional media, microblogs have many advantages. Not only do they greatly speed up the dissemination of

information and increase the reach of information, but their social attributes also facilitate communication among investors, thus making it easier to incite investor sentiment and transmit it to other investors, increasing their irrational behaviour. As a result, companies that publish too many microblogs at the time of IPO are more likely to underperform after the IPO and are more likely to perform worse in the market; moreover, the combined effects of media coverage and post-IPO market frictions are more likely to lead to lower investor returns (Bushee et al., 2020). At the same time, the long-term impact of microblogs will diminish as more and more factors influence market performance. Microblogs are more of a short-term publicity campaign during the IPO publicity period and are not directly related to long-term market performance after the IPO, and excessive publicity has the potential to create eye-candy and bullishness; once the effect they create wears off, the impact of a return to rationality will be felt. Therefore, this paper also proposes the following hypothesis:

H4: The short-term post-IPO market performance of companies that publish microblogs during the IPO publicity period is significantly lower than that of companies that do not publish microblogs.

3. Research design

3.1. Research method

The purpose of this paper is to illustrate the negative impact that inappropriate use of social media can have on capital markets. The key points in time for conducting an IPO in China are shown in Figure 1. The period from the prospectus announcement date to the stock listing trading date is a critical period for the firm to build momentum for the IPO. Considering that some companies have opened and published microblogs before announcing their prospectus, which also play a role in publicity, and that Bajo and Raimondo (2017) find that the closer the media coverage is to the listing date, the more significant the impact on IPO underpricing is, the above period is extended appropriately in this paper. Finally, the prospectus announcement date to 15:00 on the listing date is used as the research window of this paper, i.e. the IPO publicity period. The statistics of the sample in this paper show that the average IPO publicity period of listed companies is

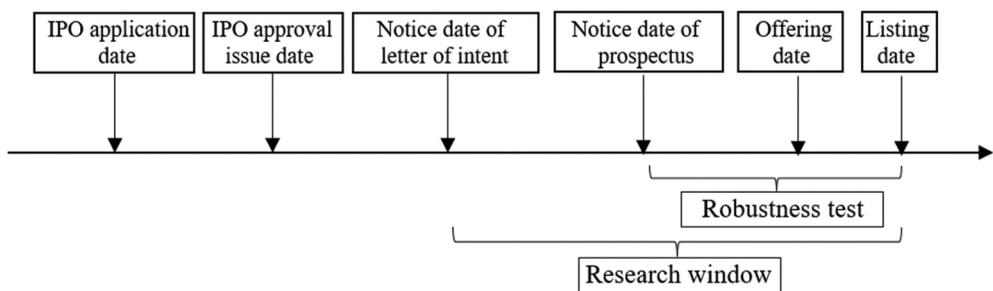


Figure 1. Key time points of IPO.

22 days, which indicates that companies generally officially list and trade on the 22nd day after the release of the prospectus.

3.2. Sample and data

This paper chooses microblogs as the research object because it wants to study how companies use social media to engage in proactive media management behaviour. Specifically, on the one hand, microblogs have cultivated a large influence and user reach since their introduction in 2009.² On the other hand, even though financial social media such as Guba have a high level of user activity and provide a centralised platform for investors to communicate and discuss, the management of such social media accounts is not controlled by companies. Therefore it does not correspond to the active media management behaviour of companies that we tried to research. Considering the availability of data, this paper selects a sample of IPO companies listed in China's Shanghai and Shenzhen A-share markets from 2010–2016.³ Regarding the microblog-related data involved in the research, they are all derived from the official microblog accounts of each listed firm on Sina microblog and manually downloaded and collated, with the rest of the data derived from CSMAR and Wind databases. We winsorise all continuous variables at the 2st and 98th levels to mitigate the potential influence of outliers.

4. Model and variables

In terms of empirical tests, equation (1) is designed as the main regression analysis model in this paper in order to verify that microblog publicity can have an impact on IPO underpricing.

$$IPOUN = C + aX_1 + \sum \beta_j Controls_j + \varepsilon \quad (1)$$

Starting from December 2013, the IPO first-day price limit policy was implemented. To capture IPO underpricing more scientifically, this paper refers to Wei et al. (2019). X_1 is the five explanatory variables measuring the firm's release of microblog during the IPO publicity period, including *WBB*, *InWBN*, *WBD*, *InZIS* and *WBO*. *Controls* represent the control variables. Based on the existing literature, this paper controls for the following four types of variables that may affect IPO underpricing: ① firm financial characteristics, including firm size *InSize*, return on net assets *ROE*, gearing *LEV*, operating income per share *InSalep* and operating capacity *InTover*; ② corporate governance characteristics, including nature of ownership *SOE*, private equity participation *IsPE*, shareholding structure *Share* and employee size *InEmployee*; ③ IPO characteristics, including issue size *InIsize*, issue expenses *Fltctr* and online winning rate *Lor*; and ④ pre-IPO issuance, expressed as hot market effect *Missue*. In addition, industry and year dummy variables are also controlled.

Similarly, H2a and H2b correspond to the following models:

$$IPOUN = C + a_1X_1 + a_2X_1 \times M + a_3M + \sum \beta_j Contorls_j + \varepsilon \quad (2)$$

²Data source: http://tech.sina.com.cn/z/weibo_developer/

³New stock offerings were suspended in 2013, and the sample period for this paper actually excludes 2013.

where *IPOUN*, X_1 and *Controls* are the same as equation (1). *M* is a moderating variable used to express the degree of information asymmetry of the firm by the standard deviation *Fpsd* of analysts' predicted price of IPO (taking the mean of the predicted price range); where the higher the *Fpsd*, the higher the information asymmetry of the firm; *InAge* indicates the youngness of the management, and the younger the management, the more attention should be paid to microblog. According to H2a and H2b, the coefficients of the interaction terms are expected to be significantly positive and negative, respectively.

Drawing on Z.X. Zhang and Wu (2021), this paper uses the mediating effects model constructed by equations (1), (3) and (4) to test H3.

$$Turno = C + \alpha X_2 \sum \beta_j Controls_j + \varepsilon \quad (3)$$

$$IPOUN = C + \alpha X_1 + a_2 Turno + \sum \beta_j Controls_j + \varepsilon \quad (4)$$

Drawing on the literature represented by C.Y. Wang and Wu (2015) and Shao et al. (2018), this paper measures investor sentiment in terms of the first-day IPO turnover rate (Wei et al., 2019). X_2 represents *WBB*, *InWBN* and *InZIS*, respectively. Controls in Equation (3) and Equation (4) are the same as Equation (1).

Further, in order to test how different types of investors are affected by microblog disclosure during the IPO publicity period, the difference in how large and small investors are affected is examined comparatively. Equation (5) was designed in the process of testing H3 as follows.

$$NB = C + \alpha X_2 + \sum \beta_j Controls_j + \varepsilon \quad (5)$$

With the help of Level2 data, this paper synthesises the way the industry and academia classify small and large investors (Dou & Luo, 2020), and also refers to the mainstream domestic databases (e.g. Wind) for small and large investors. On this basis, this paper defines trading amount less than ¥40,000 as small investor S and trading amount more than ¥1,000,000 as large investor L. In view of the difficulty to distinguish the attributes of investors in the middle amount, therefore, no corresponding research is done for them. *NB* denotes the net buy amount on the first day of listing, estimated with the buy and sell order information in Level2 data to measure the trading of large and small investors, denoted *NB_S* and *NB_L*, respectively. X_2 is the same as equation (3) and equation (4). Controls refer to control variables, including ① firm financial characteristics: firm size *InSize*, gearing ratio *Lev*, operating income growth rate *GROW* and number of traded shares *InTRDS*; ② firm governance characteristics: equity concentration *SHF5* and institutional shareholding ratio *INST*; and ③ firm information environment: number of tracking analysts *ANAL*. In addition, industry and year dummy variables are controlled for.

Finally, equation (6) is also constructed in this paper to test the effect of microblog release of IPO firms on post-IPO market performance.

$$CAR = C + \alpha X_3 + \sum \beta_j Controls_j + \varepsilon \quad (6)$$

CAR denotes cumulative abnormal stock returns, with *CAR1*, *CAR2*, *CAR6* and *CAR12* representing *CAR* for 20, 40, 120 and 240 trading days after the listing date (opening date

after 2013), respectively.⁴ X_3 is *WBB*. *Controls* represent control variables: ① firm financial characteristics, including firm size *InSize*, return on net assets *ROE*, gearing *LEV*, operating income per share *InSalep*, operating capacity *InTover*, net cash flow from operations *InCfop* and surplus quality *Adp*; ② corporate governance characteristics, including nature of ownership *SOE*, private participation *IsPE*, equity structure *Share*, and employee size *InEmployee*; and ③ pre-IPO issuance, expressed as hot market effect *Missue*. In addition, industry and year dummy variables are also controlled.

The explanation of specific variables is shown in Table 1.

Table 1. Variable definition table.

Variable name	Variable symbol	Variable definition
IPO underpricing	<i>IPOUN</i>	If the firm went public before 2013, then (closing price on the first day of listing – issue price)/issue price; If listed after 2013, then (closing price on opening day – issue price)/issue price
First Day Exchange Rate	<i>Turno</i>	Drawing on Wei et al. (2019), the first-day turnover rate if listed before 2013, and the sum of the first-to-opening day turnover rates if listed after 2013
Net buying of funds	<i>NB</i>	Drawing on Wei et al. (2019), the first-day turnover rate if listed before 2013, and the sum of the first-to-opening day turnover rates if listed after 2013 If the firm was listed before 2013, the value of the net buy-in amount on the first day of listing, and if listed after 2013, the value of the average daily net buy-in amount from the first day of listing to the opening day. The net buy amount is calculated as $NB = (Buy - Sell) / (Buy + Sell)$, where <i>Buy</i> refers to the transaction amount initiated by the buyer of firm <i>i</i> on the <i>t</i> trading day, and <i>Sell</i> refers to the transaction amount initiated by the seller of firm <i>i</i> on the <i>t</i> trading day.
Stock gains after going public	<i>CAR</i>	$CAR_i(t_1, t_3) = \sum AR_{it}$. <i>CAR1</i> , <i>CAR2</i> , <i>CAR6</i> and <i>CAR12</i> are used to denote CARs for 20, 40, 120 and 240 trading days after the IPO date (opening date after 2013), respectively.
Whether to publish microblog	<i>WBB</i>	If a microblog was posted during the IPO promotion period, the value is recorded as 1, otherwise it is 0
Number of microblogs	<i>InWBN</i>	$\ln(\text{the number of microblogs posted by the firm during the IPO promotion period} + 1)$
Richness of Microblog content 1	<i>WBD</i>	During the IPO promotion period, this item is measured by the average richness of microblog content posted by the firm and the richness of individual microblog content in terms of the presence or absence of text, links, images or videos, with one of these scored as 1
Richness of microblog content 2	<i>InZIS</i>	During the IPO promotion period, the average richness of the firm's microblog content and the richness of individual microblog content are measured by the number of characters, taking the natural logarithm
Proportion of microblogs for business activities	<i>WBO</i>	The number of business-related microblogs/microblogs posted by the firm during the IPO promotion period, with business-related microblogs including those directly related to the IPO, those related to daily operations and those promoting its own products and business, and the rest being non-business-related (e.g. chicken soup type) microblogs.
Degree of information asymmetry	<i>Fpsd</i>	This refers to the standard deviation of analysts' predicted IPO prices (taking the mean of the predicted price range), excluding the predicted prices of the lead underwriter's analysts; at least three predicted values are required for each firm

(Continued)

⁴If it is listed on the Shanghai Stock Exchange, it will be adjusted according to the Shanghai A-Share Composite Index; if it is listed on the Shenzhen Stock Exchange, it will be adjusted according to the Shenzhen A-Share Composite Index.

Table 1. (Continued).

Variable name	Variable symbol	Variable definition
Average age of executives	<i>InAge</i>	ln (average age of executives at the time of IPO), where executives refer to members of the board of directors, supervisory board and senior management
Firm Size	<i>InSize</i>	ln (year-end total assets for the year prior to the IPO)
Return on Net Assets	<i>ROE</i>	This item refers to the net profit in the year prior to the listing/average owner's equity in the same period
Gearing Ratio	<i>Lev</i>	This item refers to the total liabilities/total assets at the end of the year prior to the listing
Nature of ownership	<i>SOE</i>	This item refers to the value of 1 when it is a state-owned enterprise, otherwise it takes 0
Issue size	<i>InIsize</i>	ln (IPO financing amount)
Issuance Cost	<i>Fltctr</i>	This item refers to the actual total issue costs/total actual funds raised
Private equity participation	<i>IsPE</i>	This item refers to whether there is private placement or venture capital before the offering
Online winning rate	<i>Lor</i>	The item refers to the number of shares issued online/the number of shares effectively subscribed online
Operating income per share	<i>InSalep</i>	ln (operating income per share in the year prior to the IPO)
Operating Capacity	<i>InTover</i>	ln (working capital turnover ratio for the year prior to listing)
Shareholding Structure	<i>Share</i>	The sum of the shareholding ratio of the top five shareholders
Employee Size	<i>InEmployee</i>	ln (number of employees at the time of the offering)
Hot market effect	<i>Missue</i>	This item refers to the average IPO underpricing price of all IPO companies in the month prior to the listing date
Operating income growth rate	<i>GROW</i>	This term refers to the year-on-year growth rate of annual sales
Number of Trading Shares	<i>InTRDS</i>	ln (total number of shares traded in firm i)
Shareholding Concentration	<i>SHF5</i>	This item refers to the squared sum of the shareholding ratio of the top five shareholders
Institutional shareholding ratio	<i>INST</i>	This item refers to the shareholding ratio of institutional investors
Number of tracking analysts	<i>ANAL</i>	This term refers to the natural logarithm of the number of analysts who issue earnings forecasts for the firm
Net cash flow from operations	<i>InCfop</i>	ln (percentage of net cash flow from operating activities in the year prior to listing)

4.1. Descriptive statistics

In Table 2, descriptive statistics of the main variables of this research are presented. Among them, the mean value of *IPOUN* is 1.681, indicating that there is a high IPO depression in the Chinese stock market as a whole. During the IPO publicity period, about 9% of the sample companies (95) published microblogs, with an average number of microblogs published of about 39; the mean value of *WBD* is about 2, which is similar to the median, indicating that the content of these companies' microblogs contains, on average, two forms of text, links, images or videos, with a certain richness. In addition, the mean value of *ZIS* for the number of microblog characters of these companies is about 87, which is consistent with the briefness of microblog content, and the quantile statistics show that there is a large difference in microblog detail between samples; the mean value of *WBO* is 0.623, which indicates that most of the microblogs of these companies are related to their own business activities. The mean value of *Fpsd* for information asymmetry in the sample is 5.092 and the mean value of *InAge* for the average age of management is 3.827. All other variables are also generally consistent with previous studies.

Table 2. Descriptive statistics of main variables.

VariableHT	Sample size	Mean value	Standard deviation	p25	Median	p75
<i>IPOUN</i>	1064	1.681	2.266	0.180	0.620	2.396
<i>WBB</i>	1064	0.089	0.285	0	0	0
<i>WBN</i>	95	38.516	86.756	3	13	30
<i>WBD</i>	95	1.938	0.316	1.875	2	2.185
<i>ZIS</i>	95	87.419	37.771	62	89.750	111.526
<i>WBO</i>	95	0.623	0.385	0.212	0.700	1
<i>Fpsd</i>	822	5.092	4.415	2.143	3.799	6.424
<i>lnAge</i>	1064	3.827	0.071	3.778	3.828	3.880
<i>lnSize</i>	1064	20.204	0.793	19.635	20.083	20.679
<i>ROE</i>	1064	0.273	0.111	0.194	0.255	0.332
<i>Lev</i>	1064	0.405	0.158	0.293	0.405	0.526
<i>SOE</i>	1064	0.080	0.271	0	0	0
<i>lnIsize</i>	1064	20.088	0.645	19.626	20.032	20.488
<i>Fltctr</i>	1064	0.093	0.041	0.063	0.084	0.116
<i>IsPE</i>	1064	0.585	0.493	0	1	1
<i>Lor</i>	1064	0.009	0.009	0.003	0.006	0.010
<i>lnSalep</i>	1064	1.912	0.511	1.544	1.855	2.223
<i>lnTover</i>	1064	1.648	0.758	1.092	1.466	2.007
<i>Share</i>	1064	0.831	0.142	0.745	0.865	0.946
<i>lnEmployee</i>	1064	6.630	0.911	5.981	6.592	7.201
<i>Missue</i>	1064	1.765	2.088	0.224	0.545	3.117
<i>Turno</i>	1064	0.633	0.208	0.510	0.665	0.805
<i>NB_S</i>	748	0.006	0.138	-0.079	0.005	0.088
<i>NB_L</i>	748	-0.001	0.035	-0.004	0.000	0.006
<i>ANAL</i>	748	2.623	1.093	1.792	3.020	3.466
<i>GROW</i>	748	0.381	0.866	0.105	0.237	0.434
<i>SHFS</i>	748	0.173	0.134	0.072	0.129	0.242
<i>INST(%)</i>	748	6.324	8.301	0.296	3.474	8.430
<i>lnTRDS</i>	748	21.450	1.462	20.382	21.141	22.266

5. Empirical analysis

5.1. 4.1. microblog publicity of listed companies and IPO underpricing

This paper explores whether the release of microblogs by listed companies to create publicity affects IPO depression, and the results of the analysis combined with model (1) are shown in Table 3. It can be seen that the coefficient of whether or not to publish microblog *WBB* is 0.435, which holds significantly at the 5% level, indicating that companies that publish microblogs during the IPO publicity period have an average of 43.5% higher IPO underpricing compared to those that do not publish, and thus the economic significance is also significant. *lnWBN*, *WBD*, and *lnZIS* are significantly and positively correlated with IPO depression at the 5% level, indicating that the higher the number and richer the content of microblogs posted by companies during the IPO publicity period, the higher the IPO underpricing. *WBO* is positively correlated with IPO underpricing at the 1% level of significance, indicating that the higher the proportion of microblog content involving business activities posted by the firm during the IPO publicity period, the higher the IPO underpricing. In view of this, the use of microblogs by companies to publish information during the IPO promotion period can significantly increase IPO underpricing, which verifies H1.

Table 3. Microblog publicity and IPO underpricing of listed companies.

	(1)	(2)	(3)	(4)	(5)
	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>
<i>WBB</i>	0.435** (2.30)				
<i>lnWBN</i>		0.129** (2.09)			
<i>WBD</i>			0.215** (2.19)		
<i>lnZIS</i>				0.089** (2.13)	
<i>WBO</i>					0.775*** (2.69)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes
<i>Constant</i>	5.004** (2.15)	4.948** (2.12)	5.009** (2.16)	5.021** (2.16)	4.903** (2.12)
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes
<i>N</i>	1064	1064	1064	1064	1064
<i>Adjusted R²</i>	0.735	0.734	0.735	0.735	0.737

Note: T-values are in parentheses, using firm clustering robust standard errors. *: $p < 0.1$; **: $p < 0.05$; ***: $p < 0.01$. Same as below if not otherwise specified.

5.2. Moderation effect

The above research verifies that the use of microblogs by firms during the IPO publicity period can significantly increase IPO underpricing. Do different firm characteristics affect the relationship between microblog publicity and IPO depression? To address this question, the next part of the paper examines these issues in terms of the degree of information asymmetry and the age of management.

In order to test H2a, this paper introduces *Fpsd*, a measure of information asymmetry, on the basis of model (1), and the regression results are shown in Table 4. First, $WBB \times Fpsd$ and $lnWBN \times Fpsd$ are significantly and positively correlated with *IPOUN* at the 1% significance level, which indicating that publishing microblogs during the IPO publicity period can more significantly increase IPO underpricing when the information asymmetry is higher; and the marginal effect of the number of microblogs on IPO depression is stronger. Furthermore, the coefficients of $WBD \times Fpsd$ and $lnZIS \times Fpsd$ are both significantly positive at the 1% level, indicating that the content richness of microblogs published during the IPO publicity period is more significantly and positively related to IPO underpricing when the information asymmetry is higher. Finally, as the coefficient of $WBO \times Fpsd$ is significantly positive at the 1% level, the relationship between the proportion of microblogs published on business activities during the IPO publicity period and IPO underpricing is positively influenced by the degree of information asymmetry. Thus, the empirical results corroborate H2a, which states that the higher the degree of information asymmetry, the more significant the IPO price suppression can be if such companies use microblogging to create publicity during the IPO promotion period.

Using similar principles, this paper introduces the management age *lnAge* and the interaction term between *lnAge* and five explanatory variables to measure the management's attention to microblog based on model (1) that measures management's attention to microblog in the test of H2b. The regression results are shown in Table 5. Given that the coefficients of $WBB \times lnAge$ and $lnWBN \times lnAge$ are significantly negative, indicating that the

Table 4. Effect of information asymmetry on the relationship between firm microblog publicity and IPO depression.

	(1)	(2)	(3)	(4)	(5)
	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>
<i>WBB</i>	-0.413* (-1.73)				
<i>WBB</i> × <i>Fpsd</i>	0.110*** (3.92)				
<i>lnWBN</i>		-0.168** (-2.04)			
<i>lnWBN</i> × <i>Fpsd</i>		0.039*** (3.35)			
<i>WBD</i>			-0.230* (-1.69)		
<i>WBD</i> × <i>Fpsd</i>			0.060*** (4.28)		
<i>lnZIS</i>				-0.101** (-1.96)	
<i>lnZIS</i> × <i>Fpsd</i>				0.026*** (4.31)	
<i>WBO</i>					-0.196 (-0.50)
<i>WBO</i> × <i>Fpsd</i>					0.113*** (3.20)
<i>Fpsd</i>	0.025** (1.97)	0.031** (2.47)	0.024* (1.96)	0.025** (1.97)	0.027** (2.14)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes
<i>Constant</i>	5.831*** (3.07)	6.054*** (3.18)	5.817*** (3.07)	5.827*** (3.08)	5.871*** (3.12)
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes
<i>N</i>	822	822	822	822	822
<i>Adjusted R</i> ²	0.717	0.710	0.718	0.717	0.718

Note: Due to missing *Fpsd* for some observations, 822 observations were finally regressed.

younger the management is, the more significantly the IPO underpricing can be improved by publishing microblogs during the IPO promotion period, and the number of microblogs is positively correlated with the IPO underpricing. Regarding the richness of microblog content, the coefficients of *WBD*×*lnAge* and *lnZIS*×*lnAge* are significantly negative at the 5% level, indicating that the relationship between microblog content richness and IPO underpricing is negatively affected by the age of management. The coefficient of *WBO*×*lnAge* is negative but insignificant in the correlation between microblog content and firm operations. The regression results for the control variables are similar to H1. Overall, H2b is verified.

5.3. Channels through which microblog publicity of listed companies affects IPO underpricing

Through the above research, it is verified that companies' use of microblog publicity during the IPO publicity period can significantly increase IPO underpricing. Next, this paper uses models (1), (3), and (4) for mediating effects analysis to test the channels through which listed companies' microblog posting behaviour affects IPO underpricing, with the regression results shown in Table 6. Columns (1), (3) and (5) indicate that microblog promotion by IPO companies prior to IPO will lead to more positive investor

Table 5. Effect of management's importance of microblog on the relationship between firm microblog publicity and IPO underpricing.

	(1)	(2)	(3)	(4)	(5)
	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>	<i>IPOUN</i>
<i>WBB</i>	20.080** (2.41)				
<i>WBB</i> × <i>lnAge</i>	-5.142** (-2.36)				
<i>lnWBN</i>		9.533*** (3.24)			
<i>lnWBN</i> × <i>lnAge</i>		-2.459*** (-3.21)			
<i>WBD</i>			11.699*** (2.58)		
<i>WBD</i> × <i>lnAge</i>			-3.003** (-2.55)		
<i>lnZIS</i>				4.427** (2.38)	
<i>lnZIS</i> × <i>lnAge</i>				-1.135** (-2.34)	
<i>WBO</i>					18.933 (1.57)
<i>WBO</i> × <i>lnAge</i>					-4.762 (-1.50)
<i>lnAge</i>	1.022* (1.75)	1.089* (1.86)	1.067* (1.83)	0.990* (1.69)	0.838 (1.43)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes
<i>Constant</i>	1.538 (0.47)	1.024 (0.31)	1.312 (0.40)	1.654 (0.50)	2.130 (0.65)
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes
<i>N</i>	1064	1064	1064	1064	1064
<i>Adjusted R²</i>	0.737	0.737	0.737	0.736	0.738

sentiment. The results after adding the mediating variable *Turno* for first-day turnover for regression are shown in columns (2), (4), and (6). It can be seen that the coefficients of *Turno* are all significantly positive at the 1% level, and the Sobel test also indicates that the mediating effect holds. In other words, microblogging by IPO companies before listing has a significant positive impact on investor sentiment, and more optimistic and positive investor sentiment leads to a large number of irrational decisions and trading behaviour, which ultimately affects stock pricing.

Further, this paper provides empirical evidence at the investor level using transaction-by-transaction data (Level2 data) obtained from the official authorised channels of SSE and SZSE, with the aim of clarifying the target audience of microblog publicity. The results are shown in Table 7, which shows that, specifically, whether or not microblog *WBB* is published has a significantly positive coefficient in column (1); and this has a positive but insignificant coefficient in column (2), indicating that microblog publication by companies during the IPO publicity period significantly and positively affects net buying by small investors on the first day of listing, but has no effect on net buying by large investors. The regression coefficients of the number of microblogs *lnWBN* and the richness of microblog content *lnZIS* also indicate the same findings. Since the percentage of net buying by small investors on the first day of IPO also measures investor sentiment (Yu et al., 2015), Table 7 also confirms to some extent the inference that investor sentiment acts as a mediator. In

Table 6. Channels through which microblog publicity of listed companies affects IPO underpricing.

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Turno</i>	<i>IPOUN</i>	<i>Turno</i>	<i>IPOUN</i>	<i>Turno</i>	<i>IPOUN</i>
<i>WBB</i>	0.043** (1.98)	0.393** (2.10)				
<i>lnWBN</i>			0.018** (2.14)	0.111* (1.81)		
<i>lnZIS</i>					0.010** (1.99)	0.079* (1.91)
<i>Turno</i>		0.987*** (4.48)		0.993*** (4.50)		0.991*** (4.49)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Constant</i>	3.032*** (7.65)	2.100 (0.90)	3.021*** (7.60)	2.034 (0.87)	3.036*** (7.66)	2.105 (0.90)
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	1064	1064	1064	1064	1064	1064
<i>Adjusted R²</i>	0.244	0.741	0.245	0.740	0.244	0.741
<i>Sobel Z</i>		1.85*		1.97**		1.86*

Table 7. Microblog publicity of listed companies and large and small investors' transactions (measured by net buying).

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>NB</i>	<i>NB</i>	<i>NB</i>	<i>NB</i>	<i>NB</i>	<i>NB</i>
	<i>Small</i>	<i>Large</i>	<i>Small</i>	<i>Large</i>	<i>Small</i>	<i>Large</i>
<i>WBB</i>	0.028* (1.86)	0.007 (0.11)				
<i>lnWBN</i>			0.050** (2.06)	0.021 (0.23)		
<i>lnZIS</i>					0.006** (2.28)	0.003 (0.52)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Constant</i>	-0.048 (-0.33)	0.106 (0.54)	-0.037 (-0.47)	0.080 (0.85)	0.028 (1.17)	-0.053 (-1.37)
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	748	748	748	748	748	748
<i>Adjusted R²</i>	0.063	0.034	0.079	0.045	0.093	0.042

Note: Given that the starting time of disclosure of buy and sell order information in the Level2 data of SZSE is 7 June 2011, while the starting time of disclosure of buy and sell order information in the Level2 data of SSE is 15 April 2013, there are missing data for some IPO companies. Finally, a total of 748 observations were obtained.

conclusion, this regression result suggests that microblogs act on IPO underpricing mainly by influencing small investors due to their information disadvantage, less expertise, and poorer analytical skills, a finding that echoes the findings of Xu and Chen (2016).

5.4. Microblog publicity of listed companies and post-IPO market performance

The post-IPO market performance of companies using microblogs to generate momentum and how investor returns are affected are further explored. Based on model (6), the regression results shown in Table 8 are obtained. The coefficient of *WBB* in column (1) is -0.041, which is approximately significant at the 10% level; the coefficient of *WBB* in column (2) is -0.056, which is significant at the 5% level. This indicates that, compared with the companies that do not publish microblogs, the cumulative abnormal returns of

Table 8. Microblog publicity of listed companies and post-IPO market performance.

	(1)	(2)	(3)	(4)
	<i>CAR1</i>	<i>CAR2</i>	<i>CAR6</i>	<i>CAR12</i>
<i>WBB</i>	-0.041 (-1.65)	-0.056** (-2.17)	-0.045 (-1.32)	0.008 (0.17)
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Constant</i>	0.498** (2.15)	0.724*** (2.99)	1.136*** (3.38)	1.899*** (4.27)
<i>Industry</i>	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes
<i>N</i>	1041	1041	1041	1041
<i>Adjusted R²</i>	0.075	0.084	0.231	0.315

Note: Some of the observed control variables are missing, and finally there are 1041 observations for regression.

the companies that publish microblogs during the IPO promotion period are significantly lower 20 and 40 trading days after listing, with an average of 4.1% and 5.6% lower respectively, and the economic significance is also significant. The coefficient of column (3) *WBB* is negative but insignificant; the coefficient of column (4) *WBB* is 0.008, which is not only insignificant but also smaller in absolute value, indicating that with the extension of time, the relationship between the release of microblogs during the IPO promotion period and the cumulative abnormal returns of stocks after listing has gradually weakened. Overall, the regression results support H4 that companies that publish microblogs to build momentum during the IPO publicity period have significantly worse post-IPO market performance than companies that do not publish microblogs. Thus, it can be seen that microblogging by listed companies does not truly reflect the effectiveness of the firm's operations, but rather there is a deliberate publicity campaign to make investors overreact. This kind of move to induce investors' decision making undoubtedly brings negative impact to the capital market.

6. Robustness tests

The following tests are also conducted to ensure the robustness of the results, specifically:

① Test of issue pricing. This paper argues that companies use microblog to create publicity mainly for the purpose of raising more capital and boosting secondary market share prices. The above empirical analysis has provided direct evidence for the latter, and the issue pricing will be examined to support the former. Drawing on J.F. Zhang et al. (2020), this paper measures issue pricing using the issue P/E ratio *Pedlt* adjusted for the industry P/E ratio one month before the IPO, with the regression results shown in Table 9. Microblog publicity is significantly and positively correlated with issue pricing, as expected, suggesting that high secondary market underpricing is associated with high issue prices in the primary market (C.Y. Wang & Wu, 2015).

② Measurements of changing explanatory variables. Based on Song and Wang (2016) and Song and Tang (2019), this paper changes the measure of IPO depression to provide more accurate empirical evidence: IPO underpricing $IPOUOV = (\text{first day or opening day closing price} - \text{firm intrinsic value}) / \text{issuance price}$. The intrinsic value of the company is estimated by using the analysts' forecast data, that is, the median of the analysts' forecast price of new shares

Table 9. Microblog publicity and issue pricing of listed companies.

	(1)	(2)	(3)	(4)	(5)
	<i>Pedlt</i>	<i>Pedlt</i>	<i>Pedlt</i>	<i>Pedlt</i>	<i>Pedlt</i>
<i>WBB</i>	0.044** (1.98)				
<i>lnWBN</i>		0.014** (2.01)			
<i>WBD</i>			0.020* (1.84)		
<i>lnZIS</i>				0.011** (2.16)	
<i>WBO</i>					0.061** (2.01)
<i>lnSize</i>	-0.008 (-0.32)	-0.008 (-0.32)	-0.009 (-0.33)	-0.008 (-0.32)	-0.009 (-0.36)
<i>ROE</i>	-0.050 (-0.60)	-0.046 (-0.55)	-0.049 (-0.59)	-0.051 (-0.61)	-0.053 (-0.64)
<i>Lev</i>	0.043 (0.56)	0.042 (0.54)	0.042 (0.55)	0.044 (0.56)	0.039 (0.50)
<i>SOE</i>	-0.006 (-0.21)	-0.006 (-0.22)	-0.007 (-0.24)	-0.006 (-0.20)	-0.005 (-0.16)
<i>lnNsh</i>	-0.020 (-0.70)	-0.020 (-0.68)	-0.020 (-0.70)	-0.020 (-0.69)	-0.019 (-0.66)
<i>lsPE</i>	0.011 (0.72)	0.012 (0.76)	0.011 (0.72)	0.011 (0.73)	0.010 (0.67)
<i>Lor</i>	1.980* (1.82)	1.953* (1.80)	1.964* (1.81)	1.979* (1.82)	1.940* (1.79)
<i>lnSalep</i>	-0.034 (-1.43)	-0.034 (-1.42)	-0.034 (-1.43)	-0.034 (-1.44)	-0.033 (-1.37)
<i>lnTover</i>	0.010 (0.73)	0.010 (0.72)	0.010 (0.72)	0.010 (0.73)	0.010 (0.72)
<i>Share</i>	-0.090 (-1.64)	-0.091* (-1.66)	-0.090 (-1.64)	-0.089 (-1.63)	-0.092* (-1.68)
<i>lnEmployee</i>	-0.037*** (-2.90)	-0.037*** (-2.88)	-0.037*** (-2.88)	-0.038*** (-2.93)	-0.036*** (-2.86)
<i>Missue</i>	-0.007 (-1.43)	-0.007 (-1.44)	-0.007 (-1.44)	-0.007 (-1.43)	-0.008 (-1.52)
<i>Constant</i>	1.590*** (4.99)	1.584*** (4.96)	1.591*** (4.99)	1.588*** (4.99)	1.588*** (4.99)
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes
<i>N</i>	1060	1060	1060	1060	1060
<i>Adjusted R²</i>	0.609	0.609	0.609	0.609	0.609

Note: *lnNsh* is $\ln(\text{number of stock issues})$. Due to missing *Pedlt* for some observations, 1060 observations are finally regressed.

(the average value of the forecast price range, excluding the forecast price of the main underwriter's analysts). Table 10 shows that microblog publicity has a significant effect on IPO underpricing *IPOUOV* both at the 5% level, as expected.

At the same time, the issue of the impact of endogeneity issues on the regression results is also considered. Given that the decision to publish a microblog is usually left to the discretion of the firm, the above regression results may be subject to self-selection bias. In order to minimise the self-selection bias, a treatment effects model is also used for estimation. Column (1) of Table 11 shows the results of the first-stage regression, where *WBBM* is the industry mean of whether to publish microblog *WBB*, which is significantly positively correlated with *WBB* at the 1% level. Therefore, microblog publicity behaviour does have a significant impact on IPO underpricing of firms.

Table 10. Public firm microblog publicity and IPO underpricing (changing the measure of the explanatory variable).

	(1)	(2)	(3)	(4)	(5)
	<i>IPOUOV</i>	<i>IPOUOV</i>	<i>IPOUOV</i>	<i>IPOUOV</i>	<i>IPOUOV</i>
<i>WBB</i>	0.307** (2.13)				
<i>lnWBN</i>		0.099** (2.06)			
<i>WBD</i>			0.158** (2.09)		
<i>lnZIS</i>				0.066** (2.07)	
<i>WBO</i>					0.528** (2.43)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes
<i>Constant</i>	1.890 (0.96)	1.868 (0.95)	1.883 (0.96)	1.903 (0.97)	1.833 (0.94)
<i>Industry</i>	Yes	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes	Yes
<i>N</i>	979	979	979	979	979
<i>Adjusted R²</i>	0.631	0.630	0.631	0.631	0.633

Note: Due to missing partial observations of *IPOOV*, there are finally 979 observations for the regression.

Table 11. Microblog publicity and IPO underpricing in listed firms (endogeneity test).

	(1)	(2)
	<i>WBB</i>	<i>IPOUN</i>
<i>WBBM</i>	4.250*** (3.23)	
<i>WBB</i>		0.803** (2.17)
<i>IMR</i>		-0.224 (-1.07)
<i>Controls</i>	Yes	Yes
<i>Constant</i>	-6.218 (-0.01)	4.980** (2.18)
<i>Industry</i>	Yes	Yes
<i>Year</i>	Yes	Yes
<i>N</i>	1064	1064
<i>Wald chi2</i>		3234.87

Note: The z-values are in parentheses.

7. Conclusion

With the rapid development due to the rise of mobile Internet, social media has gained a rapid momentum, which has brought innovation to the provision, dissemination and access to information in the capital market. With the help of IPO samples, this paper finds that: ① companies that publish microblogs during the IPO promotion period have higher IPO underpricing, and the IPO underpricing increases with the more microblogs published, the richer the content, and the higher the proportion of microblogs on business activities. ② The higher the degree of information asymmetry and the more the management attaches importance to microblogs, the more significantly the IPO underpricing is increased by using microblogs to publish information during the IPO promotion period. ③ The release of microblogs by listed companies during the IPO publicity period

significantly raises IPO underpricing mainly by influencing investor sentiment, and mainly affects small investors. ④ The short-term post-IPO market performance of companies that publish microblogs during the IPO promotion period is significantly worse than that of companies that do not publish microblogs. From the above results, it can be found that companies using microblogs to create momentum at the time of IPO significantly increase IPO underpricing. However, these companies' first day of IPO was a 'flash in the pan', and their market performance afterwards was worse than that of non-microblogging companies, resulting in some losses to investors. With the help of empirical research, this paper demonstrates that the misuse of social media may play a negative role in inducing investors, which in turn has a negative impact on the capital market.

In view of this, this paper argues that a combination of formal legislative and enforcement channels and informal investor education channels should be used. With regard to legislation, government regulators should strictly regulate the management system for online service platforms and improve the regulation requirements for online media information dissemination. With regard to law enforcement, government departments can work with technology companies and social media operators to regulate and purge social media of improper disclosure of information and deliberate steering of public opinion by companies. With regard to investor education, this paper argues that there is an urgent need to cultivate and improve the rational awareness and professional skills of investors, especially small and medium-sized investors. However, the influence from other media is an objective flaw and shortcoming of this research. It is hoped that this paper will serve as a reference for subsequent research and help it to develop in a more in-depth direction.

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