

# Effect of marketing messages and consumer engagement on economic performance: evidence from Weibo

Marketing  
messages and  
consumer  
engagement

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Jia Chen and Gang Kou

*Southwestern University of Finance and Economics, Chengdu, China*

Yi Peng

*University of Electronic Science and Technology of China, Chengdu, China*

Xiangrui Chao

*Sichuan University, Chengdu, China*

Feng Xiao

*Southwestern University of Finance and Economics, Chengdu, China, and*

Fawaz E. Alsaadi

*King Abdulaziz University, Jeddah, Saudi Arabia*

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## Abstract

**Purpose** – Social media commerce provides a convenient way for users to share information and interact with each other. Few studies, however, have examined the effect of marketing messages and consumer engagement behaviors on the economic performance of marketing. This study, therefore, explored the economic performance of social media in terms of marketing messages and consumer engagement.

**Design/methodology/approach** – Using ordinary least squares regression and data collected from Weibo and Maoyan, this study analyzed the effects among marketing messages, consumer engagement and movie ticket sales.

**Findings** – The results indicated that marketing messages on Weibo had a positive effect on box office revenues, while consumer engagement behavior (whether personal or interactive) did not affect box office revenues. The results suggested that marketing messages on social media have more salient effects for predicting economic performance than consumer engagement behaviors.

**Originality/value** – This study underscores the importance of social media in consumer purchasing behavior. The findings also extend the literature related to commerce and product message design on social media platforms.

**Keywords** Social media, Marketing messages, Consumer engagement, Box office

**Paper type** Research paper

## 1. Introduction

The animated film *Monkey King: Hero Is Back* was released in China on July 10, 2015. Before its release, about 100 celebrities had been asked to recommend the film through their social media accounts, which resulted in wide discussion among the public. By August 2015, the film's official Weibo account had published 793 posts, of which 617 were user-generated content. The engagement between the official and public accounts increased enthusiasm for the film. As a result, topics related to the movie generated more than 978,000 consumer interactions on Weibo. The film ultimately grossed 956 m yuan, making it China's most successful animated film at the time (Weibo, 2015). This event shows how, the public can



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access and generate social media messages, which can then be broadcast immediately (Liu *et al.*, 2018).

Social media platforms such as Facebook (<http://facebook.com>), Twitter (<http://twitter.com>) and Weibo (<http://weibo.com>) have become the main tools for online communication among millions of users (Oh *et al.*, 2017). Users can access information on public social media accounts and then broadcast it immediately (Wang *et al.*, 2019). Therefore, with its advantages of content generation and consumer engagement, social media has become a primary means of marketing for many companies (Wang and Feng, 2017). On social media, firms' marketing messages can attract users' attention and induce further internal reactions (Rahimnia and Hassanzadeh, 2013). Businesses, therefore, regard social media as an important part of their marketing strategies (Chen and Lin, 2019; Zhang *et al.*, 2019).

Marketing messages have informational and visual aspects that can affect the user's experience. Informativeness can enhance the effectiveness of marketing messages by conforming to users' preferences (Ducoffe, 1996). Informativeness in marketing messages aims to give users enough information to facilitate purchasing decisions. At the same time, for marketing messages, social media platforms allow consumers to comment on or "like" preferred content (Dallas *et al.*, 2012), thereby generating communication information. User interactions can increase cohesiveness among consumers and thus affect marketing outcomes (Prahald and Ramaswamy, 2004; Chao *et al.*, 2019). Social media users can receive guidance and recommendations from others and make purchasing decisions accordingly (Williams, Forthcoming). Therefore, companies enable consumers to form relationships and potentially gain business value through interactions with those consumers on social media (Culnan *et al.*, 2010). As such, social media has become an important means by which businesses can influence consumers' attitudes, opinions and purchasing behaviors.

The success of a business depends on its ability to influence and engage consumers in making purchasing decisions. Although many companies focus on designing marketing messages and engaging with users online, it is common for companies to experience failure on social media. On Twitter, for example, the success rate of companies is less than one percent (Wang *et al.*, 2019). Therefore, a pertinent question arises: what are the reliable indicators of economic performance on social media? Marketing managers generally lack a clear answer to this question.

Product promotion on social media is mainly reflected through marketing messages and consumer engagement. Previous studies have focused on the relationship between consumer engagement and economic performance on social media (Oh *et al.*, 2017; Chen and Lin, 2019; Wang *et al.*, 2019). Marketing studies, meanwhile, have focused on the design of marketing messages (Yadav and Pavlou, 2014). Yet, when marketing messages are published on social media, some generate a great deal of user interaction (e.g. through "likes" and comments), while others generate very little. It is very important, therefore, for a company to know how to use the two abovementioned kinds of information on social media to promote product sales and achieve better marketing performance.

Drawing on previous studies, this study designed a model to examine the effect of marketing messages and consumer engagement on box office performance. We investigated the relationship between the number of marketing messages, personal and interactive consumer engagement on Weibo, and opening weekend movie box office performance. We mainly focused on the effects of marketing messages and consumer engagement found on social media. The informativeness of marketing messages was found to be positively related to a movie's future economic performance; consumer engagement behavior, meanwhile, did not appear to be important for box office revenues. As such, information promotion through social media can be said to play a significant role in product sales. Therefore, since there are differences between traditional e-commerce and social media commerce, companies should seek different strategies for product promotion on social media.

The rest of this paper is organized as follows. The next section reviews the relevant literature. The third section presents the research model and hypotheses. The fourth section describes the empirical study and the selection of variables. The fifth part presents the methods and results. The last section discusses the findings and their implications for research and practice.

## 2. Literature review

### 2.1 Social commerce

Social commerce refers to individuals' activities on social media platforms, where the activities correspond to commercial processes such as exchanges or purchases (Yadav *et al.*, 2013). Today, social commerce is an important part of e-commerce transactions and business activities in visual communities (Dong and Wang, 2018). Social commerce integrates interactions and commerce on social media platforms based on social media technologies and commerce practices (Liang and Turban, 2011). Specifically, technological features – such as comments, like/share/follow options and social recommendation – serve to support social commerce (Curty and Zhang, 2013). In this way, social media technologies form the foundation of online consumer interaction and business activity. At the same time, the key aspect of social commerce is commercial activity. However, some social media platforms, such as Weibo, have no business functions. Social activity on such social media platforms can increase commercial benefits by providing leads and sales (Wang *et al.*, 2019). Such activity has served to further promote the success of social commerce. Therefore, on a single platform, the connections between individual users offer great potential for social commerce.

Previous research studies on social media marketing mainly focus on the design of marketing messages and content, including information valence (Chevalier and Mayzlin, 2006), availability (Duan *et al.*, 2008), content format (Martins *et al.*, 2019; Kou *et al.*, Forthcoming) and emotional content (Yoo and Kim, 2014; Li *et al.*, Forthcoming). These studies typically focus on the effects of marketing messages on user experience and whether they are effective for attracting users (Ducoffe, 1996; Lee *et al.*, 2018). However, those studies tend to use social media as a research background and ignore the uniqueness of social media marketing. Therefore, such studies usually do not differentiate social media marketing from other types of online marketing. Meanwhile, some other studies usually pay more attention to the technical factors of social media than the specific characteristics of marketing, such as perceived usefulness (Schindler and Bickart, 2012). While these studies have deeply investigated technical factors, there has been little focus on the marketing effects of social media feedback. This study, therefore, aimed to investigate the relationship between marketing messages on social media and economic performance.

### 2.2 Consumer engagement

Consumer engagement refers to consumer behaviors focused on specific firms or brands with motives that go beyond purchasing (Doorn *et al.*, 2010). Previous studies have classified online consumer engagement as either social or conventional. Social engagement mainly occurs on social media sites, such as Facebook and Weibo, while conventional engagement mainly occurs on firms' websites (Gomez *et al.*, 2015). Consumer engagement on social media involves discussing consumer content and interacting with other consumers (Heinonen, 2011). Therefore, consumer engagement on social media creates an environment for the reception and exchange of information (Kaplan, 2012). Previous studies have examined the effect of social media engagement on business outcomes and user awareness (Chevalier and Mayzlin, 2006; Schindler and Bickart, 2012; Kou *et al.*, 2019). For example, compared to positive reviews by consumers, negative ratings and reviews can have a greater impact on

product sales (Chevalier and Mayzlin, 2006). Increasing user participation tends to have a positive effect on consumption intention (Schindler and Bickart, 2012). Many previous studies have investigated the influence of word of mouth (WOM) on movie ticket sales. For example, the volume, valence and rate of WOM usually affect box office sales and movie rankings (Duan *et al.*, 2008; Oh *et al.*, 2017). Therefore, consumer engagement on social media can be said to be strongly related to product consumption.

Some studies have explored consumer engagement on social media by identifying the antecedents and consequences of online WOM (Barger *et al.*, 2016; Pansari and Kumar, 2017; Chen and Lin, 2019). The effect of online WOM tends to be moderated by the sources and content of WOM; therefore, higher consumer participation means higher product sales (Rui *et al.*, 2013). As a special social market, online consumer engagement can be categorized by the level of consumer input, namely, the consumption of information, self-expression and self-realization and participation in social interaction (Oh *et al.*, 2017). For example, reading content on Weibo can be categorized as information consumption, while “liking” a video can be categorized as participation. Therefore, a detailed investigation of the different levels of activity in consumer engagement could be highly desirable. In addition to online WOM, it would also be useful to further analyze how different consumer engagement behaviors on social media affect economic performance.

### 3. Thereseearch model and hypotheses

In prior studies, uses and gratifications (U&G) theory has provided a functionalist explanation for why people actively use media to communicate (Calder *et al.*, 2009). In general, there are four dimensions of U&G theory: information, personal identity, integration and social interaction and entertainment (McQuail, 1985). Information refers to receiving relevant messages, seeking advice and opinions and learning security with knowledge in immediate surroundings. Personal identity refers to finding reinforcement for personal value, identifying with others on the media platform and gaining personal insight. Integration and social interaction refer to gaining insight and a sense of belonging, finding social interaction and conversation and connecting with others. Finally, entertainment refers to relaxing emotions, escaping from problems and receiving intrinsic cultural or aesthetic enjoyment (McQuail, 1985).

U&G theory has been used to examine information in the context of online experience and interactive marketing (Ratish and Baron, 2007; Bronner and Neijens, 2006). For example, Kaur *et al.* (2020) found that entertainment and affection related to U&G were positively associated with purchase intention regarding virtual goods on social media. Meanwhile, Aluri *et al.* (2016), using a U&G approach, examined the relationships between traveler’s satisfaction and purchase intention on social media; they found that informativeness and social interaction directly influenced traveler’s satisfaction and purchase intentions. Finally, Nusenu *et al.* (2018), also adopting a U&G approach, found that consumer social interaction played an important role in value creation activities at different stages.

Marketing messages are marketing stimuli that can provide relevant product information to users (Wang *et al.*, 2019). Specifically, informativeness, as the informational element of a marketing message, can strongly attract attention and responses from users (Rahimnia and Hassanzadeh, 2013). An individual’s response is mainly mediated by cognitive responses that reflect the consumer’s evaluation process when interacting with stimuli. In social media contexts, a recipient’s cognitive reactions refer to individual engagement (Sirdeshmukh *et al.*, 2002). Previous studies have shown that “likes” and comments are important metrics of consumer engagement on social media (Hoffman and Fodor, 2010). For instance, a Facebook user who clicks “like” is more engaged than the average user; he or she might spend more money on “liked” products than those that are not “liked” (He *et al.*, 2013). Therefore,

participant interaction is a key concern on social media and is an important part of consumer engagement. Consumer engagement behavior on social media is usually divided into personal and social interaction (Calder *et al.*, 2009). Personal engagement refers to self-expressive behavior (Schau and Gilly, 2003), while social interaction engagement is more interactive and serves to maintain connections in a community (Lin *et al.*, 2014). Therefore, marketing messages and consumer engagement can be applied to U&G theory frameworks.

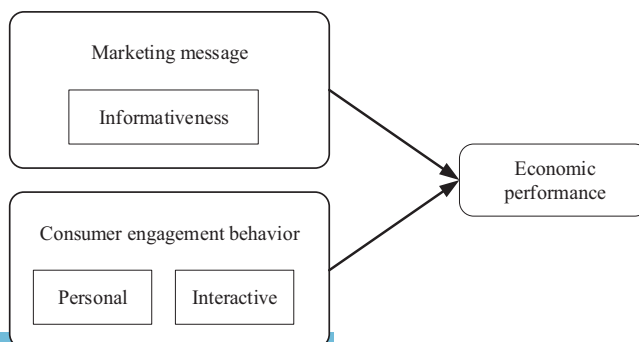
Building on U&G theory and conceptualization, Calder *et al.* (2009) examined the relationship between consumer engagement and advertising effectiveness. Using that study's framework, Oh *et al.* (2017) examined the economic performance of consumer engagement on social media. For the present study, we used the frameworks of both Calder *et al.* (2009) and Oh *et al.* (2017) to examine marketing messages and consumer engagement in relation to economic performance. Figure 1 presents the conceptual model.

### 3.1 Informativeness

Social media mainly relies on mobile terminals, providing concise, timely and interactive information to users. The goal of social media marketing messages is to provide relevant and effective content to trigger positive personal responses from users (Kim and Han, 2014). Informativeness, described as the ability to inform consumers about product types, can be used to analyze the information's effectiveness for satisfying consumer preferences (Ducoffe, 1996). The goal of social media marketing is to provide users with effective content at the right time so they can obtain favorable personal utilitarian value (Wang *et al.*, 2019). The utilitarian value of social media marketing messages depends on providing enough information to facilitate consumer buying decisions (Wan *et al.*, 2016). Therefore, large volumes and mixed forms of information (e.g. videos, images and text) are needed to clearly describe a product or service (Wang *et al.*, 2019).

Previous studies have found that the informativeness of advertising has a positive effect on participants' evaluations of advertising quality (Kim and Han, 2014; Martins *et al.*, 2019). On social media, marketing messages play an important role in users' sense of personal utilitarian value. Marketing messages that are simple, sufficient and timely can better attract users' attention and help users solve problems (Zhou *et al.*, 2012). For instance, consumers can assess whether a product meets their needs in terms of function, price and after-sales service. The advantage of informative marketing messages is that they can facilitate consumers' purchasing decisions (Zhang and Benyoucef, 2016). Thus, we propose the following:

*H1. Ceteris paribus*, a positive relationship exists between the informativeness of marketing messages and product sales.



**Figure 1.** The conceptual model: marketing messages and consumer engagement behavior in relation to economic performance

This study used the measure of movie marketing messages on Weibo as the predictor variable for informativeness.

### 3.2 Personal engagement

Personal engagement manifests as the intrinsic enjoyment a user derives from using a site (Wang, 2006). With personal engagement, users can seek stimulation and inspiration from a site and affirm their value by interacting with others (Calder *et al.*, 2009). Prior studies have found that consumers feel more involved when they engage in criticism, compliments or suggestions with regard to an organization or a product. Studies have also found that the higher a user's participation in a social networking site, the better the personal satisfaction (Pagani and Mirabello, 2011; Zhang *et al.*, 2015).

Social media platforms allow consumers to seek information. On Weibo, for example, users can search for information on a movie that interests them and follow other profiles. When users read news about the movie, they can "like" that information. With personal consumer engagement on social media, there is intrinsic motivation; therefore, people are more likely to use the content than those who are not involved in personal engagement (Pagani and Mirabello, 2011). Previous studies have found that active consumer engagement can improve a firm's economic performance and give it competitive advantages in dynamic e-commerce (Brodie *et al.*, 2013). On Facebook, for instance, consumers were found to spend five times as much on goods or brands they "liked" compared to those they did not "like" (He *et al.*, 2013). Thus, H2 is proposed as follows:

H2. *Ceteris paribus*, there is a positive relationship between personal engagement and product sales.

This study used the measure of the "likes" a movie received on Weibo as a predictor variable for personal engagement.

### 3.3 Interactive engagement

Interactive engagement often refers to gaining insight from and identifying with the circumstances of others (Calder *et al.*, 2009). In interactive engagement, users get more value from socializing, participating and receiving input from others in the community (Pagani and Mirabello, 2011). Users can also obtain fun and useful information to guide future decisions. Previous research has shown that interactive engagement has the advantage of encouraging consumer learning, commitment and brand loyalty (Keller, 2009).

Previous studies have examined the effect of interactive engagement on e-commerce and advertising. For instance, Jo *et al.* (2007) explored the interactive engagement of WOM in online commerce. Interactive engagement has been found to promote communication between potential and existing consumers through interaction (Gillin, 2008). There is also a positive correlation between the effectiveness of an advertisement and a user's interactive engagement (Lee *et al.*, 2018). When consumers use social television (TV) sites, interactive engagement usually affects both active and passive behaviors (Pagani and Mirabello, 2011). Therefore, social media platforms provide more services that encourage user interaction. Weibo users, for example, can communicate and reply by publishing text content; in this way, they can express and adopt opinions about topics. One study found that interactive engagement behavior can enhance a user's experience with a product and increase the likelihood of purchase (Sudhir *et al.*, 2016). One important reason for this is that users tend to trust and value the opinions of their friends when discussing products (Sahni *et al.*, 2018). Thus, the third hypothesis is proposed:

H3. *Ceteris paribus*, there is a positive relationship between interactive engagement and product sales.



This study used the measure of comments on movies on Weibo as a predictor variable for interactive engagement.

#### 4. Data and variables

Data were captured using web crawlers for Sina Weibo for samples of movies released in mainland China between April 2018 and March 2019. We used the movie name as a keyword and collected Weibo data with movie information. Data for each movie were downloaded within seven days before its release, including the number of “likes” and comment data on Weibo (<https://weibo.com>). These data mainly came from movies’ official and personal microblogs. We deleted movie samples with no informativeness or users’ interaction information; finally, 153 movie samples were selected.

We also obtained detailed information (e.g. box office and movie type) for each movie’s opening weekend from Maoyan (<https://piaofang.maoyan.com>). Maoyan is a leading movie portal with real-time box office data from theaters nationwide. There were two main reasons for using movies for verification data in this study: first, sales data for movies can be publicly obtained; therefore, previous studies have tended to use movie data to analyze the effects of social networks on product sales (Duan *et al.*, 2008; Wang *et al.*, 2015). Second, by 2018, there were 280 m Weibo users from around China with an interest in movies, and these users have played an important role in movie’s box office performance (Weibo, 2018).

##### 4.1 Dependent variables

Box office revenue is an important indicator of a movie’s performance (Duan *et al.*, 2008; Oh *et al.*, 2017). In this study, the main dependent variable was each movie’s opening weekend box office revenue obtained from Maoyan. The opening weekend usually includes Friday, Saturday and Sunday. Previous studies have shown that box office revenues during the opening weekend usually account for more than half of a movie’s sales during its entire release period and are therefore an important measure of a film’s overall performance (Duan *et al.*, 2008; Wang *et al.*, 2015). Opening weekend box office revenues were collected immediately after the film’s release; this helped to avoid endogeneity problems that might have existed for the film (Duan *et al.*, 2008).

##### 4.2 Independent variables

Independent variables were divided into two categories: social media and control variables.

**4.2.1 Social media variables.** The number of blogs posted on Weibo about a movie represented informativeness. We obtained the number of relevant blogs for seven days before a movie’s release. The informativeness of a marketing message mainly included blog content related to the movie that could give audiences relevant information and increase their interest. Social media users are motivated to share blogs with peers and discuss movies with other users. Previous studies have highlighted the importance of informativeness in web-based marketing (Chen and Lin, 2019). The purpose of concise, timely marketing messages is to attract consumers’ attention and help them understand the products (Zhou *et al.*, 2012).

Previous studies have examined the relationships between social media variables and economic performance. For instance, Ding *et al.* (2017) examined the effect of Facebook “likes” on box office revenues, confirming that they affect consumers’ buying behaviors. Similarly, Facebook “likes” can promote information sharing (Jin *et al.*, 2011). A social media “like” is an important personal engagement behavior that can connect individuals with movies they like (Oh *et al.*, 2017). Based on previous studies, we used “likes” for movies on Weibo as social media variables. The “like” button allows users to express their views and shows support for

movies or other products. Therefore, we downloaded the number of “likes” a movie received for seven days before its release.

Social media comments can express consumers’ opinions about a product (Wang *et al.*, 2019) and thus comprise a type of interactive engagement that binds individuals to products. Likewise, comments on Weibo affect early product adoption behaviors through immediate dissemination. This is a factor in the success of a social media distribution strategy ahead of a movie’s release. Comments reflect accumulated consumer attitudes about a movie over time. Therefore, we also downloaded the number of comments related to a movie seven days before its release. Table 1 provides descriptions of the key variables. Table 2 shows the correlation matrix of the key variables.

*4.2.2 Control variables.* Since the movies selected for this study were all released nationwide, the influence of different screening ranges on box office performance was not considered. Prior research has found that movie genre is also related to box office revenue (Elberse and Eliashberg, 2003). However, that variable differs from other variables in its effect on box office revenue (Oh *et al.*, 2017). Therefore, the control variable, genre, included eight types: romance (9.15%), drama (26.14%), action (18.95%), comedy (18.95%), animation (15.69%), documentary (1.96%), thriller (6.54%) and horror (2.61%). Table 3 shows the genre distribution for all movies in the study.

## 5. The data analysis and results

Using a robust ordinary least squares (OLS) stepwise regression model, the opening weekend box office revenue,  $\text{Log}(\text{Open revenues}_i)$ , for movie  $i$  was regressed on informativeness ( $\text{Log}(\text{Blogs}_i)$ ) and personal ( $\text{Log}(\text{Likes}_i)$ ) and interactive ( $\text{Log}(\text{Comments}_i)$ ) consumer engagement behavior. With the control variable of genre ( $\text{Genre}_i$ ), Huber–White Sandwich estimators were used to resolve heteroscedasticity and normality in the multiple regression method (Sauerbrei *et al.*, 2006). The advantage of this method is that it does not change the evaluation

**Table 1.**  
Descriptive statistics of  
the key variables

| Key variable             | Source     | Data type | Period           | Description and measurement   |
|--------------------------|------------|-----------|------------------|---|
| $\text{Open revenues}_i$ | Maoyan     | Numeric   | First weekend    | Opening weekend revenue (in tens of thousands) for movie $i$                            |
| $\text{Blogs}_i$         | Sina Weibo | Numeric   | Seven days prior | Number of blogs for movie $i$   |
| $\text{Likes}_i$         | Sina Weibo | Numeric   | Seven days prior | Number of “likes” for movie $i$   |
| $\text{Comments}_i$      | Sina Weibo | Numeric   | Seven days prior | Number of comments for movie $i$  |
| $\text{Genre}_i$         | Maoyan     | Binary    | Not applicable   | Genre type: romance, drama, action, comedy, animation, documentary, thriller and horror |

**Table 2.**  
Pearson’s correlation  
matrix of the key  
variables

|   |                          | 1       | 2       | 3       | 4 |
|---|--------------------------|---------|---------|---------|---|
| 1 | $\text{Open revenues}_i$ | 1       |         |         |   |
| 2 | $\text{Blogs}_i$         | 0.575** | 1       |         |   |
| 3 | $\text{Likes}_i$         | 0.496** | 0.904** | 1       |   |
| 4 | $\text{Comments}_i$      | 0.335** | 0.552** | 0.586** | 1 |

Note(s): \*\* $p < 0.05$



of the coefficients but has a more reasonable  $p$ -value (Oh *et al.*, 2017). The stepwise regression model thus provided a robust explanation for the relationship between informativeness and consumer engagement behavior in a film's economic performance.

5.1 The measurement model

Following prior research (Elberse and Eliashberg, 2003; Liu, 2006), this study used log-linear formulation in the model. Log-linear formulation is consistent with theoretical models of consumers' decision-making processes, where movie revenues can be viewed as a series of conditional probabilities applied to the consumer base (Duan *et al.*, 2008). We separately examined informativeness and personal and interactive consumer engagement behavior in relation to economic performance. The first model was for  $Comments_i$ , the second for  $Likes_i$  and the third for  $Blogs_i$ . Model 4 tested all three independent variables, and model 5 added the control variable (genre). The models are as follows:

$$\text{Log}(\text{Open revenues}_i) = \gamma_0 + \gamma_1 \times \text{Log}(\text{Comments}_i) + \theta_i \tag{1}$$

$$\text{Log}(\text{Open revenues}_i) = \gamma_0 + \gamma_1 \times \text{Log}(\text{Likes}_i) + \theta_i \tag{2}$$

$$\text{Log}(\text{Open revenues}_i) = \gamma_0 + \gamma_1 \times \text{Log}(\text{Blogs}_i) + \theta_i \tag{3}$$

$$\text{Log}(\text{Open revenues}_i) = \gamma_0 + \gamma_1 \times \text{Log}(\text{Blogs}_i) + \gamma_2 \times \text{Log}(\text{Likes}_i) + \gamma_3 \times \text{Log}(\text{Comments}_i) + \theta_i \tag{4}$$

$$\begin{aligned} \text{Log}(\text{Open revenues}_i) = & \gamma_0 + \gamma_1 \times \text{Log}(\text{Blogs}_i) + \gamma_2 \times \text{Log}(\text{Likes}_i) + \gamma_3 \times \text{Log}(\text{Comments}_i) \\ & + \gamma_4 \times \text{Romance}_i + \gamma_5 \times \text{Drama}_i + \gamma_6 \times \text{Action}_i + \gamma_7 \times \text{Comedy}_i \\ & + \gamma_8 \times \text{Animation}_i + \gamma_9 \times \text{Documentary}_i + \gamma_{10} \times \text{Thriller}_i \\ & + \gamma_{11} \times \text{Horror}_i + \theta_i \end{aligned} \tag{5}$$

Here,  $\gamma_0$  is the intercept,  $\theta_i$  is the error term and  $\gamma_1, \gamma_2$  and  $\gamma_3$  are the robust coefficient values of informativeness and consumer engagement behavior.

5.2 The data analysis and results

Table 4 shows that the first model,  $\text{Log}(\text{Comments}_i)$ , has a robust  $R$ -squared value of 0.201. The second,  $\text{Log}(\text{Likes}_i)$ , has a higher robust  $R$ -squared value of 0.229. The third,  $\text{Log}(\text{Blogs}_i)$ , has a robust  $R$ -squared value of 0.293. These indicate a very significant positive effect on

| Genre       | Frequency | Percentage |
|-------------|-----------|------------|
| Romance     | 14        | 9.15       |
| Drama       | 40        | 26.14      |
| Action      | 29        | 18.95      |
| Comedy      | 29        | 18.95      |
| Animation   | 24        | 15.69      |
| Documentary | 3         | 1.96       |
| Thriller    | 10        | 6.54       |
| Horror      | 4         | 2.61       |
| $N$         | 153       | 100        |

**Table 3.** Genre distribution of all movies in the study

**Table 4.**  
Robust ordinary least  
squares regression of  
box office revenue,  
*Log(Open revenues<sub>it</sub>)* as  
the dependent variable

|                                   | Model 1           | Model 2           | Model 3           | Model 4          | Model 5            |
|-----------------------------------|-------------------|-------------------|-------------------|------------------|--------------------|
| <i>Log(Comments<sub>it</sub>)</i> | 0.389 (6.430)***  |                   |                   | -0.020 (-0.175)  | -0.042 (-0.386)    |
| <i>Log(Likes<sub>it</sub>)</i>    |                   | 0.441 (7.011)***  |                   | -0.059 (-0.371)  | -0.091<br>(-0.619) |
| <i>Log(Blogs<sub>it</sub>)</i>    |                   |                   | 0.775 (8.191)***  | 0.884 (3.868)*** | 0.994 (4.62)***    |
| Romance                           |                   |                   |                   |                  | -0.821 (-1.356)    |
| Drama                             |                   |                   |                   |                  | -0.635 (-1.073)    |
| Action                            |                   |                   |                   |                  | -0.086 (-0.143)    |
| Comedy                            |                   |                   |                   |                  | -0.381 (-0.638)    |
| Animation                         |                   |                   |                   |                  | -0.258 (-0.430)    |
| Documentary                       |                   |                   |                   |                  | -1.120 (-1.656)*   |
| Thriller                          |                   |                   |                   |                  | -0.019 (0.031)     |
| Horror                            |                   |                   |                   |                  | -0.638 (-0.961)    |
| _cons                             | 5.877 (21.665)*** | 5.638 (21.242)*** | 6.030 (30.862)*** | 6.158 (20.28)*** | 6.575 (10.016)***  |
| Robust <i>R</i> -squared          | 0.201             | 0.229             | 0.293             | 0.298            | 0.422              |
| <i>F</i> -statistic               | 40.647            | 49.382            | 74.489            | 24.830           | 11.172             |

**Note(s):** \* $p < 0.1$ , \*\*\* $p < 0.01$ ,  $t$ -test values are in parenthesis

opening weekend box office. Regarding the effect of all variables, model 4 had a robust  $R$ -squared value of 0.298.  $\text{Log}(\text{Comments}_i)$  and  $\text{Log}(\text{Likes}_i)$  did not have a significant effect on opening weekend box office, only the number of blogs contributed to opening weekend revenues. In model 4, the coefficients suggest that every ten percent increase in the number of blogs increased opening weekend box office revenues by 8.84%. Therefore, the informativeness of marketing messages has an important positive influence on opening weekend revenues. Model 5, with the control variable  $\text{Genre}_i$ , generated a robust  $R$ -squared value of 0.422, similar to the results for the predictor variables. The unstandardized solutions of coefficients suggest that every ten percent increase in the number of blogs increased opening weekend revenues by 9.94%. However,  $\text{Log}(\text{Comments}_i)$  and  $\text{Log}(\text{Likes}_i)$  did not have a significant effect on opening weekend revenues.

The results, therefore, indicated that the effect of personal and interactive consumer engagement behavior on opening weekend box office was negligible, while the informativeness of marketing messages had a significant effect. Hypothesis 1 is thus supported, but hypotheses 2 and 3 are not.

One possible explanation for the insignificant effect of consumer engagement on movie box office revenues is that marketing messages provide richer multimedia information than consumer engagement, thereby attracting more consumer attention and resolving the asymmetry in consumers' adoption of film information (Song *et al.*, 2019). Previous studies have found that marketing messages on social media are more readable and helpful, which may increase the likelihood of users' attention, thereby increasing awareness of a movie (Oh *et al.*, 2015). Meanwhile, another previous study found that consumer engagement on third-party platforms (e.g. social media) had no significant effect on box office revenues (Song *et al.*, 2019); the present study's results are consistent with those findings. Therefore, marketing messages have a positive effect on product sales, while consumer engagement is insignificant.

### 5.3 Robustness tests

For the robustness tests, we selected the total box office for the first and second weeks as the dependent variable  $\text{Log}(\text{Two weeks revenues}_i)$  for each movie (models 6 and 7). More than 80% of the box office for most movies was accumulated during the first two weeks, indicating that the total box office revenue of the first two weeks is a reliable measurement variable. It is worth noting that the two-week box office involves data for a period after the film's release; therefore, this measure may be influenced by consumers who watched a movie and discussed it on social media (Oh *et al.*, 2015). In Table 5, by further expanding the release date, we can see that social media still had a significant effect on box office. In particular, informativeness had positive effects, indicating a high possibility of watching a movie after seeing information on Weibo. The robust  $R$ -squares of models 6 and 7 were 0.295 and 0.406, respectively, consistent with the results of models 4 and 5; that is, social media had a significant correlation with a film's economic performance. Table 6 presents the results of hypothesis verification.

## 6. Discussion

This study examined the impact of social media informativeness and consumer engagement behavior (personal and interactive) on movie's box office revenues using data from Weibo. The informativeness of marketing messages was found to be positively related to a movie's economic performance, while consumer engagement behavior did not have an impact. Therefore, information promotion through social media can be said to play an important role in product sales.

| INTR<br>30,5   | Model 6                          |                  | Model 7          |
|--|----------------------------------|------------------|------------------|
|  |                                  |                  |                  |
|  | <i>Log(Comments<sub>i</sub>)</i> | -0.025 (-0.200)  | -0.030 (-0.256)  |
|  | <i>Log(Likes<sub>i</sub>)</i>    | -0.044 (-0.259)  | -0.093 (-0.591)  |
|  | <i>Log(Blogs<sub>i</sub>)</i>    | 0.909 (3.729)*** | 1.033 (4.468)*** |
| <b>1576</b>  | Romance                          |                  | -0.788 (-1.210)  |
|  | Drama                            |                  | -0.536 (-0.841)  |
|  | Action                           |                  | -0.001 (-0.002)  |
|  | Comedy                           |                  | -0.285 (-0.444)  |
|  | Animation                        |                  | -0.173 (-0.269)  |
|  | Documentary                      |                  | -0.916 (-1.259)  |
|  | Thriller                         |                  | 0.138 (0.208)    |
|  | Horror                           |                  | -0.458 (-0.643)  |
|  | _cons                            | 2.288 (7.069)*** | 2.582 (3.661)*** |
|  | Robust R-squared                 | 0.295            | 0.406            |
|  | F-statistic                      | 24.268           | 10.399           |
| <b>Note(s).</b> *** $p < 0.01$ , $t$ -test values are in parenthesis |                                  |                  |                  |

**Table 5.**  
Robust ordinary least squares regression of box office revenue, *Log* (Two weeks revenues) as the dependent variable

|  | Hypotheses  | Results       |
|--|---|---------------|
| <b>Table 6.</b><br>Hypothesis verification results | H1: <i>Ceteris paribus</i> , a positive relationship exists between the informativeness of marketing messages and product sales | Supported     |
|  | H2: <i>Ceteris paribus</i> , there is a positive relationship between personal engagement and product sales                     | Not supported |
|  | H3: <i>Ceteris paribus</i> , there is a positive relationship between interactive engagement and product sales                  | Not supported |

### 6.1 Key findings

This study provides empirical support for the effects of marketing messages and consumer engagement on economic performance. Previous research has suggested that businesses should analyze the factors affecting consumer purchases to gain competitive advantage (He *et al.*, 2015). This study performed such analysis using Weibo and used empirical testing to help advance theories of marketing and consumer behavior. We found that the number of marketing messages on Weibo positively affected movie's performance, while consumer engagement did not. One possible explanation is that Weibo is mainly used for information dissemination and sharing rather than generating product-specific information (as with e-commerce) (Oh *et al.*, 2017). Thus, the effect of consumer engagement on product sales was diminished. A previous study found that the richness of media information affected users' purchasing decisions (Goh *et al.*, 2012). Therefore, we can consider that Weibo, as a social media platform, has a richer channel of information dissemination that is more conducive to marketing movies. This confirms that, compared to e-commerce platforms, on social media, the effects of information dissemination and consumer participation on product sales are different. This positive relationship between marketing messages (informativeness) and product sales means that information on Weibo can effectively attract consumers and improve their understanding of marketing information. Such product-related information increases the channels for consumers to obtain product information, enhancing the likelihood of making purchases (Martins *et al.*, 2019).

In addition, consumer perceptions of marketing messages on social media highlight the importance of such content. Even if consumers interact less with marketing messages, they

can still use them to better understand products (Wang *et al.*, 2019). Thus, marketing messages on social media have a strong competitive effect that can enhance users' attention to and evaluations of products.

### 6.2 Implications for practice

This study's findings have several useful managerial implications. Since increased product information was found to predict economic performance, companies can improve product sales by increasing product information on Weibo, even if there is no user engagement behavior (e.g. "likes" or comments). The results indicated that for every ten percent increase in the number of product information blogs, revenues increased by 9.94%. Thus, to expand publicity, marketing managers can devote more resources to developing content about products on Weibo. This has great significance for the dissemination of product information among consumers.

Moreover, marketing managers should provide customers with more information about products. This study found that consumer engagement had a negligible impact on product sales. Marketing messages, however, are important for attracting consumers and expanding product sales. Therefore, delivering high-quality product information on social media is an important and effective way to increase product sales.

### 6.3 Limitations and future research

Despite its significant findings, this study has some limitations. First, this study mainly examined the effects of official and personal microblogs on movie's box office revenues. Future research studies should analyze the different effects of these two types of microblogs on product sales. Second, this study focused on Weibo's influence on a film before its release. After a film is released, Weibo still affects subsequent box office revenues, which can be further explored in future research studies. Finally, the relationship between marketing messages and consumer engagement can be further explored, along with the economic effects.

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### About the authors

Dr. Jia Chen is a lecturer in the School of Business Administration, the Southwestern University of Finance and Economics. She got her PhD from the School of Management and Economics, the University of Electronic Science and Technology of China. She has published several papers in various peer-reviewed journals and conferences.

Dr. Gang Kou is a distinguished professor of the Chang Jiang Scholars Program in the Southwestern University of Finance and Economics, managing editor of *International Journal of Information Technology & Decision Making* (SCI) and managing editor-in-chief of *Financial Innovation* (SSCI). He is also an editor of the following journals: *European Journal of Operational Research* and *Decision Support Systems*. Previously, he was a professor of the School of Management and Economics, the University of Electronic Science and Technology of China, and a research scientist in Thomson Co., R&D. He received his PhD in information technology from the College of Information Science & Technology, the University of Nebraska at Omaha; master's degree in the field of computer science, the University of Nebraska at Omaha; and B.S. degree in the Department of Physics, Tsinghua University, China. He has published more than 100 papers in various peer-reviewed journals and his papers have been cited for more than 6,000 times. Gang Kou is the corresponding author and can be contacted at: [kougang@swufe.edu.cn](mailto:kougang@swufe.edu.cn)

Dr. Yi Peng (corresponding author of the paper) is a distinguished professor of the Chang Jiang Scholars Program, the School of Management and Economics, the University of Electronic Science and Technology of China. Previously, she worked as a senior analyst for West Co., USA. Dr. Peng's research interests cover knowledge discovery in database and data mining, multi-criteria decision-making, data mining methods and modeling and knowledge discovery in real-life applications. She has published more than 50 papers in various peer-reviewed journals such as *Decision Support Systems*. She is the guest editor of *Annals of Operations Research and Computers & Operations Research*.

Dr. Xiangrui Chao is an associate research fellow in the School of Business, Sichuan University.

Dr. Feng Xiao is a professor in the School of Business Administration, the Southwestern University of Finance and Economics, China.

Dr. Fawaz E. Alsaadi is a professor in the Department of Information Technology, Faculty of Computing and IT, King Abdulaziz University, Jeddah, Saudi Arabia. His research interests are in the field of information technology-oriented decision-making.

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