Content marketing in e-commerce platforms in the internet celebrity economy

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Abstract

Purpose – With the popularity of social media and, recently, live streaming, internet celebrity endorsements have become a prevalent approach to content marketing for e-commerce sellers. Despite the widespread use of social media and online communities, empirical studies investigating the economic value of user-generated content (UGC) and marketer-generated content (MGC) still lag behind. The purpose of this paper is to contribute both theoretically and practically to capture both first-order effects and second-order effects of internet celebrity endorsements on marketing outcomes in an e-commerce context.

Design/methodology/approach – This study conducts a cross-sectional regression to evaluate the economic value of internet celebrity endorsement, and a panel vector autoregressive model is adopted to examine the relationship between celebrities' and consumers' content marketing behaviors and e-commerce sales performance. The authors also adopt look-ahead propensity-score matching technique to correct for selection bias.

Findings – The empirical results show that the content generation efforts of marketers and the interaction behaviors between marketers and consumers will significantly influence the e-commerce sales, which refers to the first-order effects of internet celebrity endorsement. Moreover, interactions within the fan community exert second-order effects of content marketing on sales performance.

Originality/value – This paper provides new insights for e-commerce retailers to evaluate the economic values of internet celebrity endorsement, a new content marketing practice in e-commerce platform.

Keywords Content marketing, E-commerce sales, Interaction behaviours, Internet celebrity economy, Internet celebrity endorsement

Paper type Research paper

1. Introduction

The cost of people rising to fame has dropped significantly due to the popularity of social media and live streaming. There are a large number of people who contribute content through the internet. Only a few of these people can develop a distinctive social image from the content they contribute. Those who become famous by means of the internet are described as internet celebrities (Rich, 2009). E-commerce retailers have already realized the positive impact of celebrity endorsements on purchase intentions; through endorsements, internet celebrities deliver convincing information about products to consumers and consequently help e-commerce sellers reap attention and trust from consumers. Increasingly, internet celebrity acts as an endorser bridging marketers and consumers

together, and generates informative and persuasive content on social media or other online communities to actively engage consumers.

In the broadest sense, the value of internet celebrity is generated by social interactions between individual fans (especially "super fans") and the celebrities they follow as well as social interactions within the fan community (Liang and Shen, 2016). For example, the selfie era has created a new billionaire: Kim Kardashian West. She has amassed a gargantuan social media following 59m Twitter followers and 124m Instagram followers and turned it into an estimated \$350m fortune[1]. The social media queen has parlayed those loyal fans into a real fortune by selling them a mobile game, emojis and cosmetics. Celebrity endorsements are currently increasingly prevalent in online platforms. The academic literature on advertising provides ample evidence of the positive effects of using celebrities on both advertisements and brand evaluations (Erdogan, 1999; Hambrick and Mahoney, 2011; Hung *et al.*, 2011). However, internet celebrity and traditional celebrity are two types of opinion leaders involved in different business models. On the one hand, traditional celebrity builds up idol-centered fans economy relying on fanatical emotion of fans. Increasing marginal utility can be observed for the consumption behaviors of fans as proposed in rational addition model. On the other hand, internet celebrity participates in content-centered intellectual property operation. Audience will also participate and interact in content contribution, which establishes a reciprocal information communication platform.

In the social endorsement literature, a widely accepted explanation for endorsement effects has been that celebrities bring credibility to content marketing, which causes consumers' attention and trust to the endorsed retailers and hence attracts them to buy more of the products from the endorsed retailers. We refer to such marketing outcomes as first-order effects of endorsement. In addition, social interactions among consumers in fan community might reinforce social presence in online shopping environment, which enhances consumers' trust toward online sellers and thus increases purchase intention. However, these second-order associations among the consumers in fan community tend to be ignored in the literature, though they can be regarded as second-order effects of content marketing. In previous research, marketer-generated content (MGC) and user-generated content (UGC) are regarded as two independent communication channels to promote purchasing (Goh *et al.*, 2013; Trusov *et al.*, 2009; Albuquerque *et al.*, 2012). Prior UGC studies are largely preoccupied with various aspects of online reviews or word-of-mouth (WOM) after purchase, such as review volume (Chevalier and Mayzlin, 2006; Duan *et al.*, 2008), review subjectivity (Goes *et al.*, 2014) and readability (Ghose and Ipeirotis, 2011). As an exception, John *et al.* (2017) assessed whether joining a brand's social networking (SN) membership changes consumers' purchase behavior in the offline sense by accounting for both first-order and second-order effects of brand SN membership. Unlike brand SN marketing, celebrity endorsement marketing relies on consumers' strong attachments to celebrities (Thomson, 2006) rather than brand loyalty. Whether celebrity endorsements can improve brand attitudes and increase purchasing via the second-order association with the fan community is ambiguous.

Documenting and accounting for the social endorsement effect are of practical importance to e-commerce retailers. Specifically, the endorsement effects may vary for retailers of different ranks in the market. The literature has discovered that sales distribution in markets are altered by using information technology. For example, by examining a database of book sales, Peltier and Moreau (2012) suggest that online information influences consumers' purchase decisions and leads them to shift from bestsellers to medium- or low-sellers. Brynjolfsson *et al.* (2011) find that even online and traditional channels have the same product availability and prices, and the online channel shows a less concentrated sales distribution. The less concentrated distribution is not only due to the increase in product selection but also may be due to internet search and discovery

tools such as recommendation systems (Brynjolfsson *et al.*, 2011). In our context, internet celebrity can serve as a manual recommender, a supplement to the artificial intelligence recommendation algorithm. Internet celebrity endorsement provides a new channel for traffic relocation in e-commerce platforms. Hence, internet celebrity endorsement might be an important approach for "medium-volume sellers" to compete for attention with "top sellers." "Top sellers" usually enjoy benefits from organic searches because high ranking sellers always receive more attention. In contrast, "medium-volume sellers" do not enjoy such a benefit from their ranking in the market, but they still account for the majority of the retailers on e-commerce platforms. By relying on internet celebrity endorsement, "medium-volume sellers" may introduce more referral traffic to their products/services and therefore increase their business performance.

Our work aims to contribute theoretically and practically to capturing both first-order effects and second-order effects of internet celebrity endorsement on retailers' performance in an e-commerce context. We address the knowledge gap by assessing whether internet celebrity endorsement can increase e-commerce sales by changing the behaviors of the consumers who are in the fan community (i.e. first-order effects) and the friends of those consumers (i.e. second-order effects). Moreover, our research targets "medium-volume sellers" in e-commerce platforms so that the confounding effect of brand loyalty and organic searches can be effectively controlled. We first employ a cross-sectional regression to quantify the population average effect of internet celebrity endorsement. The results show that internet celebrity endorsement exerts significant positive effects on the endorsed retailer's average daily user views, the amount of average daily sales and the average number of new fans, which answers the first research question about whether internet celebrity endorsers can bring supernormal profit to e-commerce retailers. We also use a panel vector autoregression (PVAR) model (Holtz-Eakin *et al.*, 1988) estimated by the generalized least square (GLS) method (Orsini *et al.*, 2006) based on the longitudinal data of celebrities' content contribution behaviors and consumers' interaction behaviors in the fan community. The results suggest that different content marketing channels lead to diversified effects on sales performance and that the interaction behaviors (shares, likes and comments) within the fan community give rise to the second-order effects of content marketing on sales performance, which answers the second research question about how diversified content marketing channels and frequent interaction within fan communities may contribute to economic value.

The rest of this paper is organized as follows. Section 2 reviews the relevant literature on content contributions, opinion leaders, celebrity endorsement effect and social interactions. Section 3 proposes the main hypotheses that we aim to test. Next, in Section 4, we describe the data and research context. The models and estimation results are described in Section 5. Finally, Sections 6 and 7 provide a discussion and conclusion.

2. Literature review
This paper is related to three streams of research. The first is research on the impact of UGC and MGC on sales. The second stream of research relates to the impact of opinion leaders on sales and celebrity endorsement effect. This paper also draws upon the literature examining the impact of social interactions on sales. To place our study within these literature streams, we review several relevant studies in the three streams and discuss how our work is related to these literature streams.

2.1 The impact of UGC and MGC on sales
How UGC or WOM can play a role in product sales has been widely studied in many papers. Many earlier studies (e.g. Dellarocas, 2003) have examined the significant relationship between UGC and product sales, such as more positive online consumer reviews leading to

more sales. More recent studies have employed more nuanced methods to develop this relationship. Dewan and Ramprasad (2009) employ the Granger causality methodology and two-stage least squares analysis to examine the relationship between music blog buzz and album sales. The results indicate that blog buzz has a positive impact on album sales, and this effect is stronger for independently released music. Ghose and Ipeirotis (2011) re-examine the influence of reviews on product sales and find that the extent of subjectivity, informativeness, readability and linguistic correctness in reviews matters in influencing sales. Zhu and Zhang (2010) consider how product and consumer characteristics moderate the relationship between online consumer reviews and product sales. The findings suggest that the influence of consumer reviews is stronger for less popular games and games whose players have more internet experience. Keehyung *et al.* (2013) suggest that review credibility and user popularity moderate the positive effect of average ratings and the diversity of ratings on sales. Meng *et al.* (2018) reveal that consumers assess product value by weighting high-quality positive and negative reviews, which then positively influences product sales and exerts a dynamic effect on sales through the moderating role of product selling stage and popularity. In brief, these studies highlight that UGC has a significant impact on product sales. Due to the moderating role of product and consumer characteristics, UGC can make a difference by targeting various products and consumers.

In addition to consumers, marketers also generate content to advertise their products. A few studies have examined how MGC can influence product sales (Godes *et al.*, 2005; Dellarocas, 2006). For example, Dellarocas (2006) develops an analytical model to study the economic impact of firms, disguised as customers, posting anonymous messages to internet-based opinion forums. The result of the author's analysis is that strategic manipulation can either decrease or increase the information value of online forums to consumers relative to the case in which no manipulation takes place. Although firms' activities are considered in these studies, they are mainly conducted anonymously for the purpose of creating UGC that praises their products or by offering incentives to consumers to do so. The effect of marketers' directly generated content, rather than anonymous messages, on sales has not yet been widely examined. Kumar *et al.* (2013) examine how firms can make use of social media and the impact of online marketing efforts on firms' return on investment. Kumar *et al.* (2016) study the effect of firm-generated content in social media on three key customer metrics: spending, cross-buying and customer profitability. The results indicate that firm-generated content has a positive effect on customers' behavior, and the effect is greater for more experienced, tech-savvy and social media-prone customers.

2.2 The impact of opinion leader on sales and celebrity endorsement effect

There is growing evidence that consumers are influenced by online opinion leaders before making a variety of purchase decisions. An opinion leader, who is generally more interconnected and has a higher social standing, can deliver product information, provide recommendations, provide personal comments and supplement professional knowledge, which may help companies boost sales. Opinion leaders influence the members of their social networks by disseminating information (Chaney, 2001). Research on information diffusion has focused on how opinion leaders interact with and influence their interpersonal networks, particularly by online means (e.g. Case *et al.*, 2004; Hardy and Scheufele, 2005). Individuals are now likely to turn to online opinion leaders and adopt their attitudes or ideas, particularly in relation to purchasing decisions that are strongly affected by online information (Case *et al.*, 2004). A large number of methods have been developed to identify opinion leaders, such as social network analysis, text mining and PageRank-based algorithms (e.g. Li and Du, 2011; Ma and Liu, 2014).

Celebrities are special and critical opinion leaders in influencing others to take their advice (Weisfeld-Spolter and Thakkar, 2011). However, internet celebrities such as popular

bloggers, YouTube personalities and "Instafamous" profiles are different from traditional celebrities such as film stars, musicians and sports icons from four aspects. First, unlike the general appealing image of a traditional celebrity, internet celebrities demonstrate more expertise in their own fields, which can improve the credibility of the content they deliver. Internet celebrities narrowcast customized content to viewers, which meets the specific interests of target consumers (Young, 2004). Second, internet celebrities are more closely connected with their audience because of their intensive use of social media (Rasmussen, 2018). This could result in more equal relationship and two-way communication between celebrities and fans, whereas the traditional way is one-way communication only from celebrities to fans. Besides, internet celebrities also tend to inspire engagement within their fans (García-Avilés, 2012). Third, different from traditional celebrities who only play their role by simply appearing in the advertisement and persuading consumption via their social impact, internet celebrities also participate in the creation of promotional content (García-Rapp and Roc-Cuberes, 2017). They endorse a product by introducing or implanting it in content. Finally, because of these differences, the mechanisms traditional celebrities and internet celebrities influence others are not the same. Fans of traditional celebrities display more characteristics of feverish emotion, religious worship and rational addiction (Spenner *et al.*, 2010) in their consumption behavior. What they care more about is the fanatical emotions embodied in buying behavior. However, the content broadcast by internet celebrities is more informative, from which viewers collect information. Fans of internet celebrities are more concerned about the purchase itself. Thus, social interactions between internet celebrities and fans which could increase fans' emotional trust play an important part. In addition, social interactions within the fan community are also crucial, since they are able to clarify product information (Lin, 2008) and also enhance the social presence in fan community (Weisberg *et al.*, 2011). In fact, Djafarova and Rushworth (2017) found that consumers believe that some products endorsed by traditional celebrities are overpriced. Therefore, internet celebrities are perceived to be more credible, persuasive and informative, particularly with regard to purchase decisions concerning products or brands.

Celebrity endorsement is beneficial to increasing the likelihood of purchase (Friedman and Friedman, 1979), fostering brand loyalty and positively influencing WOM (Bush *et al.*, 2004). It has been widely adopted in marketing practice and has received a lot of studies in the literature. There are four main accepted theoretical perspectives explaining why and how a celebrity endorser can have an effect on consumer behaviors, including source credibility model, source attractiveness model, product match-up hypothesis and meaning transfer model. Source credibility model argues that the effectiveness of a message depends on perceived level of expertise and trustworthiness in an endorser (Hovland *et al.*, 1953). Jin and Phua (2014) find that, compared to a celebrity endorser with a low number of followers, a celebrity endorser with more followers is significantly associated with a higher rating for source credibility. Source attractiveness model contends that the effectiveness of a message depends on similarity, familiarity and liking for an endorser (McGuire and William, 1985). Attractiveness does not simply mean physical attractiveness, but includes any virtuous characteristic. The experiment by Patel and Basil (2017) shows that interest in the endorsed product increases for female consumers when the celebrity is attractive, while, for male consumers, both attractiveness and identification are important, which confirms that attractiveness does make a difference in generating interest in endorsement. Product match-up hypothesis maintains that for effective advertising, messages conveyed by celebrity image should be congruent with the product (Forkan, 1980; Kamins, 1990). Wright (2016) verifies the original match-up hypothesis, which maintains that messages conveyed by celebrity image should be congruent with the product for effective advertising, and further reveals how perceived endorser "appropriateness" drives the match-up effect. And meaning transfer model suggests that celebrity endorsers bring their own symbolic

meanings to the endorsement process. The symbolic meanings residing in a celebrity go beyond the person and are passed on to the endorsed products (McCracken, 1989). Knoll *et al.* (2017) examine whether the meaning of celebrities is transferred to endorsed brands and how this effect develops over time. The authors' results confirm the meaning transfer model and that the effect appears to be substantially stronger after approximately one week. There are also some other perspectives on celebrity endorsement. For instance, Gong and Li (2017) introduce a new audience factor, the fan-celebrity parasocial interaction, to explore the celebrity endorsement mechanism within a microblog context. These theoretical perspectives not only provide a theoretical basis for the influence of internet celebrity endorsers on consumer behaviors and merchant sales but also provide theoretical guidance for merchants to choose endorsers to maximize the positive effect.

2.3 The impact of social interaction on sales
The rapid development of social media has greatly facilitated social interaction activities. A survey conducted by Shriver *et al.* (2013) suggested that a large proportion of users' motivation to tweet is to facilitate socializing or interacting with others. Consumers tend to be influenced by their social interactions with others when making purchase decisions (Godes *et al.*, 2005). Customers can have access to social knowledge and experiences to support them in better understanding their online purchase purposes, and in making more informed and accurate purchase decisions. Social interaction in e-commerce context can be divided into two categories: interactions among consumers and interactions between consumers and marketers.

There are few existing studies emphasizing that consumers' online interaction behaviors may also affect the production of reviews and therefore sales. Sussan (2012) tests customer-to-customer interaction in the movie industry and finds that consumer-to-customer interaction adds much power to explain movie sales. Phang *et al.* (2013) study what kind of user interaction patterns in discussing a niche cultural product may have an impact on enhancing consumption intentions and suggest that interaction patterns with high inclusiveness and betweenness centralization can increase participation levels and therefore consumption intentions. Goes *et al.* (2014) use both panel data and flexible matching methods to study how users' online interactions influence the generation of their reviews. The authors find that these interactions actually facilitate the generation of product reviews, and as users become more popular, they produce more reviews and more objective reviews.

The existing research also rarely involves the interaction between the two complicated roles of consumers and marketers in inducing purchases. In the context of previous research, consumers and marketers are regarded as two independent communication channels to promote purchasing (Goh *et al.*, 2013; Trusov *et al.*, 2009; Albuquerque *et al.*, 2012). Goh *et al.* (2013) quantify the influence of community content from consumers (UGC) and marketers (MGC) on consumers' apparel purchase expenditures and find that UGC has a stronger effect on consumer purchase behavior than MGC. Trusov *et al.* (2009) show that WOM referrals have substantially longer carryover effects and produce substantially higher response elasticities than MGC. However, currently, consumers not only passively receive content generated by a celebrity but also are eager to interact with the celebrity. In the "internet celebrity economy" context, there are strong consumer-marketer (i.e. celebrity vs fans) relationships, ·which induce value transfer to the endorsed products. Consumers, once merely passive recipients of marketing campaigns, are now shifting to become active members of fan communities and participate in content marketing via posting, commenting, or sharing to ensure the success of products in the marketplace. Hung *et al.* (2011) find that the fan-celebrity relationship is positively correlated with consumers' evaluations of and purchase intentions toward the celebrity-endorsed brand. The authors argue that celebrities need to have positive ties with consumers before the latter perceive the endorsements as

credible or attractive. Thus, rather than regarding users and marketers as two independent roles in influencing sales, we should simultaneously consider the impact of online interactions between users and marketers and interactions among users on sales.

3. Hypotheses development

It is recognized that celebrity endorsement advertising is a new prevalent marketing tool (McCracken, 1989). There is a wealth of literature on endorser effects, providing insights into the efficacy of endorser effects, the underlying processes and the conditions that may enhance endorser effects. The main explanations of endorser effects provided in the literature include source credibility, image consistency and affect transfer (Mittelstaedt *et al.*, 2000). Traditional celebrities include film stars, musicians, sports icons, TV personalities and writers. In recent years, there has been a rise in new types of internet celebrities, such as bloggers, YouTube personalities and "Instafamous" profiles. Celebrity endorsement is currently prevalent in online platforms. Internet celebrities can serve as a reference for their fans in forming values and attitudes and making purchasing decisions. Djafarova and Rushworth (2017) find that internet celebrities are more powerful than traditional celebrities, as consumers regard them as more credible and more closely related to them. Previous studies confirm that opinions from social media are considered very important for users (Thoumrungroje, 2014; Wilcox and Stephen, 2013). Thus, internet celebrities serving as opinion leaders can exert a significant influence on users' purchasing decisions. Therefore, we propose the following hypothesis:

> *H1.* The sales performance of internet celebrity-endorsed products is significantly better than that of those without an internet celebrity endorsement.

The question of how online content can have an impact on product sales has been examined in many prior studies. The majority of efforts concentrate on the outcomes of UGC or WOM, such as consumer reviews, ratings and blogs (Dellarocas, 2003; Chevalier and Mayzlin, 2006). On the other hand, several previous studies have underlined that users' online interactions may also influence the generation of ratings, thus affecting product sales. Sussan (2012) finds that consumer-to-customer interaction is effective in explaining movie sales. Goes *et al.* (2014) apply both panel data and a flexible matching method to explore how interactions among online users influence their participation behavior. Based on these findings, content readers are no longer silent, as many websites become increasingly "social" (Dellarocas and Wood, 2008). For instance, readers may "like" the content or share it via social networks; they may ask each other questions within the community and rate the content as helpful or unhelpful. That is, the social features of sites allow users to easily interact as never before. Previous studies have focused on the constructs of social interactions such as WOM, observational learning and social support (Lin, 2008). While these studies offer insights that social interactions will help consumers clarify product information, and further encourage them to buy high-quality products and prevent them from buying inferior products, they may have overlooked the overall effects of social atmosphere. According to social presence theory (Fulk *et al.*, 1987), online consumers are able to get more social cues to support their purchasing decisions by collecting more information from the communities, by observing the actions of other consumers, or by interacting with them. Social presence theory has been indicated as a suitable theoretical lens for understanding the social interactions in e-commerce (Rice and Case, 1983; Gefen and Straub, 2004; Hassanein *et al.*, 2009). In the context of internet celebrity endorsement, the conscious design of the communicating and shopping environment to induce certain emotional and cognitive states in consumers will significantly increase their purchasing probability. When fans interact actively, they may be more likely to be persuaded to purchase. Therefore, when considering the effectiveness of internet celebrity endorsement,

we should not overlook social interactions within the fan community. These considerations lead to the following hypothesis:

H2. Social interactions within the fan community may positively influence e-commerce sales.

A few papers have studied how firms can play a role in controlling or manipulating UGC and online WOM (Dellarocas, 2006; Godes *et al.*, 2005). Although marketers' activities are considered in these studies, they are mainly conducted anonymously for the purpose of pretending to be UGC. Because of the simultaneous engagement of consumers and marketers on social media, consumers' purchase decisions can be influenced by both. In this study, we take one step further and study how internet celebrities, as third-party marketers, can directly generate advertising content and boost sales. According to the marketing literature that examines the impact of traditional advertising on sales, a marketing action can influence the sales performance of a firm or a brand in six different ways, including contemporaneous effects, carryover effects, purchase reinforcement, feedback effects, firm-specific decision rules and competitive reactions (Dekimpe and Hanssens, 1995). Generally, there is an immediate effect of advertising on sales. It has been suggested that UGC influences purchase intentions through both persuasive and informative communications, while MGC only affects purchase intentions through persuasive communications (Goh *et al.*, 2013). Nevertheless, the views above may no longer be accurate in the "Internet celebrity economy" context, where celebrity worship firmly links loyal fans (as consumers) with internet celebrities (as third-party marketers). Due to celebrities' increasing engagement in social media, content is increasingly directly generated by celebrities through a variety of forms, such as video and live. For example, recently, live streaming has become a new popular means by which internet celebrities can deliver real-time content to viewers via the internet. Moreover, instant comments, virtual gifts and other functions allow fans to have closer interactions with internet celebrities. Both the content contribution effort of celebrities and the interaction between celebrities and consumers have a significant impact on the efficiency of content marketing in the "internet celebrity economy" era. Therefore, we hypothesize the following:

H3a. The content contribution efforts of celebrities positively influence e-commerce sales.

H3b. Social interactions between celebrities and consumers also positively influence e-commerce sales.

4. Data and context
The data used in our study were obtained from Taobao, one of China's largest "consumer to consumer" (C2C) e-commerce platforms. We collected transaction data of 56,060 medium-volume sellers in June 2017 whose main business is women's apparel, which is a segment in which internet celebrities play an important role in guiding consumption. We focus on "medium-volume sellers" whose sales rank is in the middle of the long tail distribution rather than "top sellers" or "bottom sellers." Because "medium-volume sellers" are the most promising candidates to become "top sellers" in the whole e-commerce platform, they have the greatest potential to further enhance the number of successful transactions with the help of internet celebrities. It is these middle-ranking sellers who are eager to engage in content marketing to promote their products.

Based on previous literature on e-commerce (Goh *et al.*, 2013; Ranganathan and Grandon, 2002), our data set contains information on three aspects: the basic characteristics of retailers, content marketing behaviors and transaction history. The basic characteristics of retailers include their star rating level, detailed seller ratings (DSR), total number of followers, online shop duration and whether the retailer has invited

internet celebrities to conduct content marketing. The daily information on content marketing behaviors covers the number of different types of marketing content (such as the number of daily content of items, number of daily content of lists, number of daily content of posts, number of daily content of costume matches, number of daily content of videos and number of daily content of live streams), the number of social networking site (SNS) interactions between celebrities and fans, and the number of interactions within the fan community, including the number of like, share and comment behaviors of fans. The daily information on transaction history contains average transaction price of products in the store, daily user visits, daily sales amount and daily conversion rate (i.e. the ratio between the number of visitors to a store and the number of visitors who purchase products in the store in one day).

5. Models and results

5.1 Model specification

First, based on monthly average cross-sectional data, we conduct a classical regression (Equation (1)) to examine whether internet celebrity endorsements significantly boost sales. Dependent variables related to sales performance include the log transformation of average daily user visits, the log transformation of average daily sales amount and the average log odds of the purchase event, which is represented by the ratio of the positive conversion rate to the negative conversion rate (i.e. $\ln(p/(1-p))$). In addition, we add the log transformation of the number of daily new followers of e-commerce retailers as another dependent variable, which is particularly crucial for completing the closed loop of the internet celebrity economic ecosystem. The independent variable of interest is *Celebrity_endrose*, which is the indicator of whether retailers have invited internet celebrities to conduct content marketing. The average transaction price of products in the store (*Price*) are used to control the important impacts of product price and product discount on e-commerce sales. We also add the number of advertisements generated by retailers as a daily average (*Seller_Ads*) to control the advertisement effect except for endorsement. In addition, online shop duration, star rating level, DSR and total number of followers are control variables to capture the observed characteristics' heterogeneity across different retailers. We provide the variable measurement in the cross-sectional data regression in Table I.

Variable	Description	Literature
Dependent variable		
UV_log	Log transformation of average daily user visits	Pentina *et al.* (2011)
Sales_amount_log	Log transformation of average daily sales amount	Pentina *et al.* (2011)
Conversion_log_odds	Average log odds of purchase event, represented by the ratio of positive conversion rate to negative conversion rate	Pentina *et al.* (2011)
New_followers_log	Log transformation of the number of daily new followers	De Veirman *et al.* (2017)
Independent variable		
Endorsement	Indicator of whether have invited internet celebrities	Elberse and Verleun (2012)
Control variable		
Price	Average transaction price of products sold in online shop	Chen and Dubinsky (2003)
Seller_Ads	Average daily number of advertisements	Luk *et al.* (2002)
Shop_open_time	Duration since the opening date of online shop	Ghose and Sundararajan (2006)
Star_rating	Star rating level	Yong *et al.* (2018)
DSR	Detailed seller ratings	Yong *et al.* (2018)
Total_followers	Total number of followers	De Veirman *et al.* (2017)

Table I.
Variable measurement in the cross-sectional data regression

www.

The descriptive statistics of the key variables for the cross-sectional data regression are shown in Table II:

$$y = \beta_0 + \beta_1 Endorsement + \beta_2 Price + \beta_3 Seller\_Ads + \beta_4 Shop\_opentime$$

$$+ \beta_5 Star\_rating + \beta_6 DSR + \beta_7 Total\_followers + \varepsilon, \tag{1}$$

$$y = \{UV\_log, Sale\_amount\_log, Conversion\_log\_odds, New\_followers\_log\}. \tag{2}$$

To examine the first-order effects and second-order effects of endorsement, we conduct a further investigation into how the four outcome variables mentioned above can be influenced by consumers' interaction behaviors and celebrities' content marketing behaviors. The interaction between celebrities and fans exerts first-order effects on product sales. Additionally, interactions within fan communities may have second-order effects on product sales. In addition, celebrities' strategic content contribution behaviors regarding different types of marketing channels are also regarded as vital antecedent variables. Therefore, we use a PVAR model (Equation (3)) in which each dependent variable is formulated as a linear function of its own lagged value ($y_{i,t-1}$), other relevant covariates and retailer-specific time-invariant effects (u_i). The weekly averaged content marketing behaviors of internet celebrities, interaction behaviors between celebrities and fans and interaction behaviors within the fan community are considered independent variables of interest that correspond to the contemporary sales outcome variables, which implies the existence of the features of rapid response and frequent updates of e-commerce. Furthermore, the lagged sales outcome variables from the previous time period are introduced to solve the time-series autocorrelation and endogeneity issues. Daily average transaction price of products is included to control the confounding effect of price. In this longitudinal scenario, we aggregate the data with a one-week time window to build a balanced panel data set, which allows all time-invariant individual effects to be considered either fixed effects or random effects. Such time-invariant effects cannot be captured except for coefficient parameters from pure cross-sectional data (Hsiao, 2007). In our setting, the unobserved time-invariant effect reflects the retailer's unobserved characteristics that may have an impact on the customer's purchase decision, such as customer service ability and product quality. The measured regressors can be correlated with those unobserved characteristics. Therefore, a fixed effect model specification is adopted. The result of the Hausman test ($p = 0.0000$) also confirms that the fixed effect model is superior to the alternative random effect model. We provide the variable measurement in the panel data regression in Table III. The descriptive statistics of the

Variables	n	Mean	SD	Min.	Max.
UV	56,060	3,164	7,327	0	241,986
Sales_amount	56,060	4,543	13,076	0.0100	1.923e+06
Conversion_rate	56,060	0.0239	0.0516	0	1
New_followers	56,060	27.22	106.6	0	5,349
Celebrity_endorse	56,060	0.181	0.385	0	1
Seller_Ads	56,060	0.346	0.583	0	8.500
Shop_open_time	56,060	1,621	949.3	32	5,125
Star_rating	56,060	10.66	1.891	0	19
DSR	56,060	4.725	0.281	0	5
Total_followers	56,060	22,246	69,976	0	4.287e+06
Price	55,974	202.9	710.6	0.01000	68,538

Table II.
Summary statistics of the variables in the cross-sectional data regression

Variable	Description	Literature
Dependent variable		
UV_log	Log transformation of average user visits	Pentina *et al.* (2011)
Sales_amount_log	Log transformation of average sales amount	Pentina *et al.* (2011)
Conversion_log_odds	Average log odds of purchase event, represented by the ratio of positive conversion rate to negative conversion rate	Pentina *et al.* (2011)
New_followers_log	Log transformation of the number of new followers	De Veirman *et al.* (2017)
Independent variable		
Item_cnt	The number of content of items	
List_cnt	The number of content of lists	
Match_cnt	The number of costume matching content	
Video_cnt	The number of content of videos	
Live_cnt	The number of live streaming content	Foster (2016)
Post_cnt	The number of content of posts	
SNS_share_cnt	The number of share behavior of fans	Hausman *et al.* (2014)
SNS_favor_cnt	The number of like behavior of fans	Hausman *et al.* (2014)
SNS_comment_cnt	The number of comment behavior of fans	Hausman *et al.* (2014)
SNS_interact_cnt	The number of interactions between celebrities and fans	John *et al.* (2017)

Table III.
Variable measurement in the panel data regression

variables employed in the panel data regression are shown in Table IV:

$$y_{i,t} = u_i + \beta_1 y_{i,t-1} + \beta_2 Price + \beta_3 Item\_cnt_{i,t} + \beta_4 List\_cnt_{i,t} + \beta_5 Match\_cnt_{i,t},$$

$$+ \beta_6 Video\_cnt_{i,t} + \beta_7 Live\_cnt_{i,t} + \beta_8 Post\_cnt_{i,t} + \beta_9 SNS\_interact\_cnt_{i,t}$$

$$+ \beta_{10} SNS\_share\_cnt_{i,t} + \beta_{11} SNS\_favor\_cnt_{i,t} + \beta_{12} SNS\_comment\_cnt_{i,t} + \varepsilon_{i,t} \quad (3)$$

Variables	*n*	Mean	SD	Min.	Max.
UV	40,516	3,897	7,686	0	260,729
Sales_amount	40,516	5,199	10,273	1	495,454
Conversion_rate	40,516	0.0182	0.0332	0	1
New_followers	40,516	33.4	133	0	8,516
SNS_interact_cnt	40,516	2.109	37.17	0	4,338
SNS_share_cnt	40,516	0.0677	2.912	0	576
SNS_favor_cnt	40,516	1.084	12.38	0	1,086
SNS_comment_cnt	40,516	0.831	28.11	0	3,151
Item_cnt	40,516	0.012	0.964	0	144
List_cnt	40,516	0.000444	0.0263	0	2
Match_cnt	40,516	0.00106	0.0463	0	5
Video_cnt	40,516	0.000444	0.0222	0	2
Live_cnt	40,516	0.00042	0.043	0	8
Post_cnt	40,516	0.00128	0.0421	0	2
Week	40,516	2.5	1.118	1	4
Price	40,508	146.1	288.6	1	17,400

Table IV.
Summary statistics of the variables in the panel data regression

$$y_{i,t} = \{UV\_log_{i,t}, Sale\_amount\_log_{i,t}, Conversion\_log\_odds_{i,t}, New\_followers\_log_{i,t}\}. \quad (4)$$

5.2 Empirical results

We use the ordinary least squares method to estimate the effects of internet celebrity endorsement on sales performance and online store popularity, which can reflect the real economic value of endorsement. The results show that the endorsement of internet celebrities will not only increase the user visits of online stores by 96.99 percent ($e^{0.678}$) but also boost sales amounts by 45.79 percent ($e^{0.377}$). Furthermore, e-commerce retailers, with the help of internet celebrities, will obtain 102.18 percent more ($e^{0.704}$) new followers on average than other retailers. All of the above estimation results are consistent with our hypotheses. However, the negative coefficients of internet celebrity endorsement (−0.239) on conversion rate indicate that traffic introduced by internet celebrities is not relatively effective. The observed sales growth comes at the price of greater exposure for products with content rather than accurately targeting potential high-value consumers. Table V reports the estimation results of the cross-sectional regression on the four different dependent variables.

The PVAR model with fixed effect specification allows us to estimate the factors that may influence daily user visits, daily sales amount, daily conversion rate and the number of daily new followers. These factors can be divided into two categories. The first category is internet celebrities' content contribution efforts in different marketing channels. We are surprised to find that, compared to other content marketing channels, the latest popular online social network channel, live streaming, is negatively related to the sales amount and conversion rate of the endorsed products. One possible explanation is that the large amount of cash flow generated during live streaming distracts followers of internet celebrities from spending more money on endorsed products. For example, viewers can reward internet celebrities by giving different kinds of virtual gifts when watching the live streaming instead of purchasing the endorsed products. In addition, costume matching recommendations will attract additional user visits and new followers but fail to effectively convert content readers into purchasers. Moreover, list, video and post content types are positively related to sales amount or user visits, respectively. The majority of content types fail to improve the conversion rate of endorsed products, except for item promotion content. Item promotion content is specifically designed to recommend a single product without excessive modification, so the odds of purchase are relatively higher. The second category is interaction behaviors. The results show that, although the interaction behaviors between celebrities and consumers have significantly positive impacts on user visits, sales amount and the number of new followers, the conversion rate actually decreases significantly as the interaction behaviors between celebrities and consumers increases. This finding is consistent with the results of the previous cross-sectional model, which suggests that celebrity interactions with fans are not an efficient way to accurately target potential consumers who are willing to buy endorsed products. In contrast, interaction behaviors within fan communities, such as comment or sharing via social networks, have significantly positive impacts on conversion rate, which indicates that these interaction behaviors among consumers generative informative UGC that provides an effective information flow to potential consumers who are more likely to purchase. Nevertheless, although followers' SNS sharing behaviors play significant positive role in boosting user visits, promoting sales amount, increasing conversion rate and attracting more new followers, the number of likes within fan community is negatively associated with conversion rate and the number of comments within fan community has no significant impacts on user visits and the number of new followers of online shops. This finding implies that interaction behaviors such as likes and comments are less effective to spread information outside of fan communities than SNS sharing behaviors. Table VI reports the estimation results of the PVAR on the four different dependent variables.

Variables	UV_log coef	Sale_amount_log coef	Conversion_log_odds coef	New_followers_log coef
Endorsement	0.678*** (0.153)	0.377** (0.134)	−0.239*** (0.0687)	0.704*** (0.158)
Price	−0.000102*** (0.0000201)	0.000236*** (0.0000544)	−0.0000725*** (0.0000201)	−0.0000257*** (0.00000798)
Seller_Ads	0.875*** (0.0124)	0.806*** (0.0116)	−0.223*** (0.00675)	0.941*** (0.0151)
Shop_opentime	−0.000217*** (0.000000771)	5.45e-06 (9.14E-06)	−0.000125*** (0.00000483)	−7.41e-05*** (7.11E-06)
Star_rating	0.323*** (0.00477)	0.0569*** (0.00661)	0.0245*** (0.00356)	0.141*** (0.00494)
DSR	0.607*** (0.0377)	0.665*** (0.0578)	−0.549*** (0.0288)	0.504*** (0.0315)
Total_followers	7.39e-07*** (1.56E-07)	1.15e-06*** (1.64E-07)	−1.30e-06*** (1.58E-07)	3.67e-06*** (4.32E-07)
Constant	0.498** (0.191)	3.256*** (0.293)	−1.568*** (0.147)	−2.301*** (0.168)
Observations	55,974	55,974	55,883	55,974
R-squared	0.233	0.148	0.101	0.277

Notes: Robust standard errors in parentheses. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$

Table V.
Estimation results of
the cross-sectional
data regression

Variables	UV_log coef	Sale_amount_log coef	Conversion_log_odds coef	New_followers_log coef
Lagged_outcome ($t-1$)	0.988*** (1.42E-04)	0.985*** (8.00E-05)	0.986*** (6.20E-04)	0.935*** (4.47E-04)
Price	0.0000713*** (3.18E-06)	0.000134*** (1.46E-05)	−0.000115*** (1.20E-05)	0.000150*** (2.17E-06)
Item_cnt	−0.00131 (0.000944)	0.00306 (0.00164)	0.00451*** (0.000342)	−0.00286 (0.00220)
List_cnt	0.0625 (0.0558)	0.150** (0.0534)	0.00781 (0.0361)	0.0589 (0.0534)
Match_cnt	0.142*** (0.0377)	−0.0282 (0.0653)	−0.211*** (0.00296)	0.287*** (0.0418)
Video_cnt	0.05517* (0.0257)	0.102*** (0.0297)	−0.00540 (0.0343)	0.0125 (0.0467)
Live_cnt	0.0220* (0.0108)	−0.0612*** (0.00324)	−0.0780*** (0.00629)	0.247* (0.106)
Post_cnt	0.0787*** (0.00655)	0.0336 (0.0256)	−0.0430* (0.0174)	0.00156 (0.00268)
SNS_interact_cnt	0.00117*** (0.000280)	0.000556* (0.000232)	−0.00102** (0.000325)	0.00473*** (0.000561)
SNS_share_cnt	0.00880*** (0.000598)	0.0256*** (0.00103)	0.00864*** (0.000766)	0.0332*** (0.00130)
SNS_favor_cnt	0.000514*** (0.0000378)	0.000256*** (0.0000436)	−0.000453*** (0.0000457)	0.00160*** (0.0000721)
SNS_comment_cnt	0.0000116 (0.0000319)	0.000126*** (0.0000147)	0.000164** (0.0000598)	0.000132 (0.0000753)
Observations	30,381	30,381	30,353	30,381
Number of retailers	10,129	10,129	10,120	10,129

Notes: Robust standard errors in parentheses. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$

Table VI.
Estimation results of
the panel vector
autoregression

5.3 Robustness check

Although we try to address the potential endogeneity problem by employing a PVAR model (Holtz-Eakin *et al.*, 1988) estimated by GLS (Orsini *et al.*, 2006), possible sample selection bias still exists that may cause the overestimation of the endorsement effect. Our empirical study is conducted based on samples of e-commerce retailers who decided whether to adopt internet celebrity endorsement. Given the context of an economic adoption decision, it is natural to believe that there is a range of unobserved variables that are heterogeneous for e-commerce retailers who self-select into endorsement treatment groups. One can argue that retailers who have high sales performance are more likely to invite internet celebrities to generate advertising content because internet celebrity endorsement requires a large financial expenditure. Thus, the internet celebrity endorsement effect might be overestimated.

To evaluate the potential self-selection problem in our empirical study, we further undertake the look-ahead propensity score matching (LAPSM) technique (Bapna *et al.*, 2018) to correct for selection bias. LAPSM accounts not only for the observed characteristics in the matching procedure but also for the unobserved characteristics linked to the retailer's intrinsic propensity to adopt. Specifically, we focus on a group of retailers who first adopted internet celebrity endorsement before June 9, 2017 and employed internet celebrity endorsement between June 2, 2017 and June 9, 2017. We then match each of these retailers in the treatment group to a user who remained a nonadopter in this one-week period but who actually adopted internet celebrity endorsement between June 9, 2017 and July 28, 2017. Because both the treatment and the matched control group ultimately adopt internet celebrity endorsement (but at different time periods), we account not only for the observed characteristics via propensity score matching but also for the unobserved variables that affect whether the retailers decide to adopt internet celebrity endorsement. Moreover, the number of advertisements generated by retailers in both the treatment and control groups during the one-week period are constrained to be zero, which eliminates the confounding effect of advertisement. The matching procedure successfully found a matched sample of 2,704 internet celebrity-endorsed retailers (i.e. 1,352 early adopters in the treatment group, and 1,352 late adopters in the control group). The summary statistics of the matched sample are shown in Table VII. The average sales performance metrics (i.e. average daily user visits, average daily sales amount, average daily conversion odds and average daily new followers) during the one-week period between the treatment and control groups are subsequently compared in the cross-sectional regression shown in Table VIII. The results suggest that the retailers who adopt internet celebrity endorsement exhibit a statistically and economically significant increase in sales performance. Specifically, due to internet celebrity endorsement,

Variables	(1) n	(2) Mean	(3) SD	(4) Min.	(5) Max.
UV	2,704	0.738	1.860	0	47.32
Sales_amount	2,704	2.402	18.87	0	850.9
Conversion_rate	2,704	0.00115	0.00363	0	0.0400
New_followers	2,704	6.537	51.49	−144.5	1,683
Celebrity_endorse	2,704	0.500	0.500	0	1
Shop_open_time	2,704	1,982	949.0	435.5	5,337
Star_rating	2,704	10.86	1.665	4.400	18
DSR_ avg	2,704	4.817	0.141	3.786	5
Total_followers	2,704	13,810	45,634	83.56	1.444e+06
Price	2,704	229.6	612.2	1	21,878

Table VII.
Summary statistics of the look-ahead propensity score matching sample

Variables	(1) UV_log	(2) Sale_amount_log	(3) Conversion_log_odds	(4) New_followers_log
Endorsement	0.396*** (0.0159)	0.361*** (0.0322)	1.010*** (0.0862)	0.0500*** (0.00782)
Price	1.69E-05 (1.42E-05)	−2.72E-05 (1.58E-05)	−8.11E-05 (4.26E-05)	−4.95E-07 (2.57E-06)
Shop_opentime	−3.91E-05*** (9.32E-06)	−1.04E-04*** (1.73E-05)	−2.72E-04*** (4.69E-05)	1.14E-06 (6.53E-06)
Star_rating	0.0790*** (0.00606)	0.132*** (0.0108)	0.421*** (0.0296)	0.00414 (0.00356)
DSR	0.178*** (0.0468)	0.488*** (0.0893)	0.415 (0.288)	0.0591*** (0.0148)
Total_followers	6.29E-07 (4.95E-07)	−9.25E-07** (2.99E-07)	−3.65E-06*** (8.83E-07)	−1.56E-06 (8.85E-07)
Constant	−1.465*** (0.248)	−3.335*** (0.453)	−16.77*** (1.465)	4.665*** (0.0929)
Observations	2,704	2,704	2,704	2,704
R-squared	0.252	0.102	0.127	0.138

Notes: Robust standard errors in parentheses. $*p < 0.1$; $**p < 0.05$; $***p < 0.01$

e-commerce retailers in the treatment group receive 48.59 percent more user visits, 43.48 percent more sales, 174.83 percent higher conversion odds and 5.13 percent more new followers than those late adopters in the control group.

6. Discussion

According to the empirical results, content marketing with internet celebrity endorsements plays a deterministic role in directing and increasing traffic to e-commerce retailers. This paper has three noteworthy findings. First, we empirically confirm that internet celebrity endorsement has a significant positive impact on e-commence retailers' average user visits, average sales amount and average number of new followers. However, contrary to our expectations in *H1*, internet celebrity endorsement is negatively related to the conversion rate. The conversion rate indicates consumers' willingness to pay. The negative impact of internet celebrity endorsement on the conversion rate suggests that "medium-volume sellers" introduce too many invalid user visits (as the denominator) but fail to target potential consumers (as the numerator) through content marketing. Despite the great effort made by internet celebrities in content marketing, viewers attracted by content or internet celebrities are not willing to buy the products sold by e-commerce retailers. Thus, more elaborate product and internet celebrity image match-up strategies are needed. Moreover, according to the LAPSM procedure, the conversion rate of early adopters actually increased after the internet celebrity endorsement compared with that of late adopters, but such increments might be absorbed by the large number of user visits (as denominators) when compared to retailers who never adopt internet celebrity endorsement campaigns. Overall, internet celebrity endorsement significantly boosts the sales performance of e-commerce retailers.

Second, the estimation results of our model suggest that various different content marketing channels will exert diversified effects on online stores' sales performance and popularity. Although live streaming has recently become the most popular social network channel, it is not as effective as other content marketing channels in increasing the sales amount and conversion rate of e-commerce retailers. Marketing content in the form of lists, posts and costume matching will either improve the sales amount or introduce more user visits and new followers to e-commerce retailers. Nevertheless, only item-specific advertising content has a positive effect on the conversion rate. These findings indicate that e-commerce retailers could benefit in different ways from a wide variety of content marketing channels, including online store popularity, sales amount, conversion rate and brand exposure, which confirms our *H3a*. Content marketing achieves its optimal performance when effectively combining various channels rather than simply adding them together.

Third, the interactions within fan communities (such as likes, comments and shares) can give rise to the second-order effects of content marketing on sales performance, which

supports *H2*. Among them, SNS sharing behaviors are the most effective way to boost user visits, promote sales amount, increase conversion rate and attract new followers, whereas the number of likes and comments fail to spread the information of endorsed products beyond fan communities. In contrast, the interaction between celebrities and fans exerts a significant positive effect on user visits, sales amount and the number of new followers, but a significant negative effect on conversion rate. *H3b* is partially supported. Our empirical results suggest that the interaction behaviors between celebrities and consumers are less effective at targeting potential purchasers of the product. According to Goh *et al.* (2013), communication among consumers is both persuasive and informative. Interactions within the fan community can generate an effective information flow to content viewers (seeding in the market), converting them into potential purchasers. Thus, our finding offers a solid theoretical foundation for e-commerce retailers to exploit the value-creation potential of fan communities as well as their social networks. However, celebrity worship only produces a one-way persuasive effect from the celebrity to fans. Although the interaction behaviors between internet celebrities and their fans enhance such persuasive influence, the success of transferring celebrity worship into brand loyalty depends primarily on active interaction behaviors within the fan community (such as sharing or comments) that brings informative content. In conclusion, the significant difference between internet celebrity endorsers and ordinary marketers is that the fan community of an internet celebrity possesses substantial second-order effects on sales performance.

This paper contributes to the information systems literature by quantifying the value of recurring participation in e-commerce content marketing by both marketers (i.e. internet celebrities) and consumers (i.e. fans). The main focus of previous MGC research on the relationship between content marketing and purchase intentions may have unwittingly and erroneously concluded that retailers can only respond passively. Although marketers are able to produce content, the power and impact of MGC are greatly underestimated. In fact, the role of marketers could be shifted from a reactive and passive to a proactive and positive role by actively engaging internet celebrity in content marketing. The "internet celebrity economy" provides a new business model for retailers to gain more economic value from social media platforms.

This paper also contributes to the marketing and advertising literature on the internet celebrity endorsement phenomenon. Based on the theory of endorsement, celebrities are considered capable of adding premium value to specific objects, issues and events, making them more valuable or more impressive. The reputation of internet celebrities who have become famous through the internet is attributed to the efforts of their fans to a large extent. Therefore, fans of internet celebrities are active participants in the content marketing activity rather than passive receivers. The findings of this empirical study offer a new perspective for e-commerce retailers to strategically leverage consumers' social networks and their interactions with internet celebrities. We highlight the important role of fan communities in content marketing.

Our research also provides advice for practitioners, especially e-commerce retailers. In fact, e-commerce platforms have always wanted to introduce more traffic from content platforms. Consumer sellers in the C2C market do not have brand goodwill, which is different from business sellers in the B2C market. Hence, celebrity endorsement effects are much easier to achieve for those e-commerce retailers. Our studies provide useful guidelines for e-commerce retailers to collaborate with internet celebrities. First, we empirically evaluate the economic value of internet celebrity endorsement for sales performance of e-commerce retailers. While internet celebrity endorsement brings additional user visits, sales amount and new followers, it significantly reduces the conversion rate, which suggests that "medium-volume sellers" fail to accurately target potential consumers with the help of internet celebrities. To improve the efficiency of endorsement effects, product and internet

celebrity image match-up principles should be addressed. Second, we identify the key factors that play important roles in the success of content marketing in e-commerce platforms. "Medium-volume sellers" can achieve higher sales performance by optimizing the combination of various content marketing channels and encouraging the interaction between celebrities and consumers as well as the interaction among consumers, which is important for the healthy development of the internet celebrity economic ecosystem.

7. Conclusion and limitations

In this study, we investigate whether and how internet celebrities, as content marketers, and fans, as seeding consumers, influence e-commerce sales performance, which provides insights into research on internet celebrity endorsement and MGC. A cross-sectional regression is conducted to evaluate the economic value of internet celebrity endorsement, and a PVAR model is employed to examine the relationship between celebrities' and consumers' content marketing behaviors and e-commerce sales performance. The empirical results emphasize that the interaction behaviors within the fan community exert second-order effects on content marketing in the "internet celebrity economy" era.

There are also limitations in our study that need to be taken into further consideration. Thus, this study can be extended in two ways. The first is to improve the understanding of endorsement effects by distinguishing between the individual characteristics of internet celebrities, such as credibility, expertise and attractiveness. Although we have already identified the economic value of internet celebrity endorsement, a sophisticated matching model of the endorsement market can be applied to investigate the "match-up" hypothesis regarding celebrity advertising (Kamins, 1990). The hypothesis implies that celebrity endorsement may enhance both product- and ad-based evaluations if the product's characteristics "match-up" with the image conveyed by the celebrity. We defer such research questions to future studies. The second is to examine consumers' attitudes and behaviors toward internet celebrity endorsement. Our study evaluates the economic value of internet celebrity from the perspective of e-commerce retailers. Nevertheless, consumer behavior analysis will bring new insight into the advertisement carry-on effect and wear-out effect in the context of internet celebrity endorsement, which establishes a complete ecosystem in the "internet celebrity economy."

Note

1. www.forbes.com/sites/natalierobehmed/2018/07/11/why-kim-kardashian-west-is-worth-350-million/#52272b3e4f7b

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