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Deciding whether manufacturing firms share product links on owned social media considering fan effects

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Abstract: An optimization model is proposed to examine the choice of sharing or not sharing the product link for manufacturing firms with owned social media by considering the role of fan effects. The equilibrium marketing effort level and firm profit in both cases are compared. The results show that the firm chooses to share (not share) the product link when the social platform commission rate is low (high). Moreover, the likelihood of sharing the product link increases as the fan effect weakens and the perceived conversion cost strengthens. Interestingly, the marketing effort level increases with the product price, but firm profit does not always follow. Additionally, as the fan effect and fan count grow, so does the firm's profit. Furthermore, when the firm shares the product link, the level of marketing effort and firm profit decrease with the commission rate. Conversely, when the firm does not share the product link, those aforementioned factors increase as the perceived conversion cost declines. These results thus suggest that firms should enhance the influence of owned social media to attract more high-quality fans, and social platforms should optimize the product link functionality.

Key words: fan effect; self-media marketing; product link; marketing effort

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Recently, social platforms have experienced explosive growth with large influxes of user traffic, whereas e-commerce platforms have nearly saturated user traffic. Then, a new direction emerges in e-commerce marketing: cross-platform diversion. This refers to the phenomenon in which firms import user traffic from social platforms into e-commerce platforms via various marketing strategies[1]. The rapid development of social platforms paved the way for the era of fan economies. For firms, fans are extremely loyal and low-price-sensitive consumers with high economic value. This is because fans have a strong positive emotional attachment to their objects of attention (e.g., virtual brand images) and extend that attachment to their surroundings (such as brand products). Therefore, many firms with e-commerce stores create self-media accounts to establish virtual brand images and cultivate fans through blog posts and interactions with social media users. Meanwhile, social media platforms introduce a new feature for businesses: the product link, which allows users to click on it and be directed to relevant product pages on e-commerce platforms. In practice, when manufacturing firms with e-commerce stores publish product-related blogs on owned social media, they sometimes include the product link, but not always. Therefore, the e-commerce manufacturing firm with its own social media must answer the practical question: when is it appropriate to share the product link?

A subset of the literature addresses firms' owned social media, and we draw upon two lines of relevant research: 1) the effects of firm's owned social media on business and 2) the impacts of a company's own social media on brand attitudes and purchasing behavior. For example, Chung et al.[2] finds that the richness and responsiveness of a firm's social media efforts have a positive impact on its market performance. Meanwhile, Chang et al.[3] investigates a travel company's marketing efforts on its own Facebook brand page and shows that Facebook campaigns boost tourism sales. For the second line of research, Xie et al.[4] finds that brand exposure to owned social media activities has a significant impact on consumers' likelihood of purchasing. Meanwhile, Gupta et al.[5] demonstrates that consumer engagement via the Facebook fan page builds trust, which in turn positively affects the purchase intention. Thornhill et al.[6] discovers that a company's own social media exposure influences brand purchasing behavior.

Our work is also related to the fan literature, and this paper draws on three lines of research: 1) the fan concept and the fan effect formation process; 2) relationships between fans and brands, as well as their impact on fan behavior; and 3) the effects of fan and general consumer differences on business strategies. The concept of fans has not yet formed a unified understanding in the academic field, but it generally has connotations such as "extremely enthusiastic" and "loyal follower"[7-10]. Xu et al.[11] proposes three influencing factors for the realization of the fan effect: brand experience, brand identity, and brand image. Meanwhile, Zhang et al.[12] shows that the fan

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effect is formed in three stages: receiving, resonating, and sharing. For the second line of research, Hsu [13] finds that brand authenticity and identification positively affect brand trust and passion in community-brand relationships. Moreover, Lee et al. [14] demonstrates that social capitals in online fan pages impose brand evangelistic behaviors. For the third line, Zhou et al. [15-16] examines information disclosure and signaling strategies considering the heterogeneity between fans and general users.

The studies[2-6] mostly discuss the impact of the firm's owned social media on business effects and consumer behaviors; however, the firm's decision behavior on owned social media is rarely studied. Moreover, several studies[7-14] primarily analyze the fan concept, the fan effect formation process, and the relationship between the fan and the brand, whereas Refs. [15 − 16] primarily depicts the impact of fan taste and value-added psychological utility on disclosure strategies. However, few studies have used mathematical modeling methods to portray the impact of the fan effect on marketing strategies. To fill this gap, this study constructs an optimization model to determine when to share the product link and examines the marketing effort level and the role of the fan effect when the manufacturing firm's owned social media releases a product-related blog.

1 Model

1.1 Model description

Consider a market manufacturing firm that opens an online store to sell products on an e-commerce platform and registers a self-media account to export product-related blogs to a social platform. The product price is denoted by $p(p>0)$ with the marginal cost of production normalized to zero. The level of marketing effort is denoted by $\theta(\theta>0)$ [17-18], which denotes the firm's efforts to make product-related blogs more visible to a wider range of general users. We assume that marketing efforts only affect the number of general users who have viewed product-related blogs because fans are usually "extremely enthusiastic" and do not miss product information posted by firms' self-media accounts. In practice, firm's marketing efforts may include improving the quality of blogs to increase spontaneous referrals, creating retweeting sweepstakes, and paying for social media promotion services. According to Kaya et al. [19], the cost of marketing efforts is $c\theta^2/2$, where $c(c>0)$ is the marketing cost coefficient, with the economic implication that the cost of marketing efforts increases with the marketing effort level. In our model, the e-commerce platform and the social platform have a cooperative relationship, allowing the product link feature to be developed. If the firm shares the product link, it must pay a commission of $\delta(0<\delta<1)$ percentage of sales contributed by social platform users to the social platform, in accordance with existing business practices. The transaction service fee charged by the e-commerce platform is assumed to be zero because it does not affect the model's main conclusions. Fig. 1 illustrates the interaction of manufacturing firms, e-commerce platforms, and social platforms. It shows the entire process of converting social platform users into potential consumers on e-commerce platforms and then into actual consumers under the cross-platform diversion phenomenon.

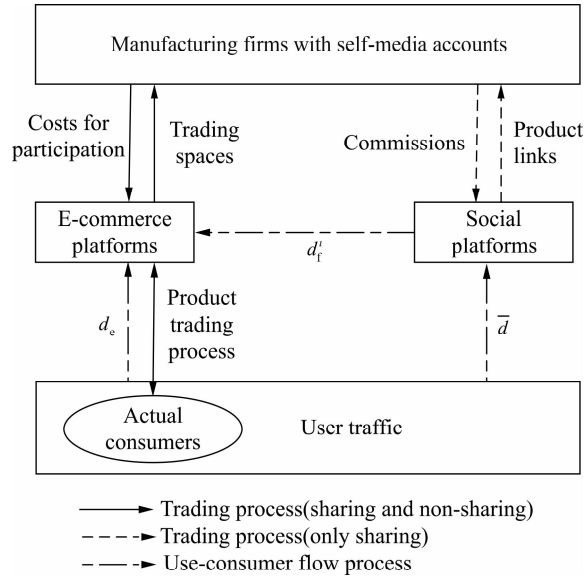

Fig. 1 Interaction between firms, e-commerce platforms, and social platforms

In Fig. 1, $\bar{d}$ indicates the number of users who have viewed the product-related blog on the social platform; d_f^i indicates the number of potential consumers diverted from the social platform to the e-commerce platform; $i=n, s$, where n represents the case in which the firm does not share the product link, and s represents the case in which the firm shares the product link; d_e indicates the number of potential consumers on the e-commerce platform. We assume that the user traffic of the e-commerce and social platforms does not overlap.

Following Karray et al. [20], the market demand contributed by users of e-commerce platforms and the market demand contributed by users of social platforms can be given separately by the following equations:

$$D_e = d_e - p \tag{1}$$

$$D_f^i = d_f^i - p \tag{2}$$

At this point, the firm profit in each sharing and non-sharing case of the product link can be given separately as follows:

$$\pi_n = (D_e + D_f^n)p - \frac{c}{2}\theta^2 \tag{3}$$

$$\pi_s = D_e p + (1-\delta)D_f^s p - \frac{c}{2}\theta^2 \tag{4}$$

1.2 Basic assumptions

We assume that the number of potential consumers on the e-commerce platform is set to 1, i.e., $d_e = 1$. Subsequently, we denote the fan count of the firm's self-media account and the number of general users attracted by self-media marketing as $\beta(\beta > 0)$ and $m\theta$, respectively, where $m(m > 0)$ is the marketing effort influence, with the economic implication that the number of general users increases with the marketing effort level[21]. Then, we can treat the sum of the two, $\bar{d} = \beta + m\theta$, as the number of users who have viewed the product-related blog on the social platform. Let U_k^i denotes the perceived product value regardless of the price, and $k = h, g$, where h denotes the fans and g indicates the general users. Assume that $U_h^n = \xi(v + \Delta V) - \Phi - t$, $U_g^n = \xi v - \Phi - t$, $U_h^s = \xi(v + \Delta V) - \Phi$, and $U_g^s = \xi v - \Phi$, where v indicates the product quality and Φ denotes the mismatching degree between the product and the consumer demand. To simplify the calculation, we assume that $v = 1$, $\Phi = 0.5$; $\xi \in [0, 1]$ represents the consumer evaluation of the product quality, which is drawn from a uniform distribution; $\Delta V(\Delta V > 0)$ denotes the fan effect, which captures the strong positive emotional attachment that the fans assigned to the firm's product due to their enthusiasm for the firm's virtual brand image on the owned social media[22]; $t(0 < t < 0.5)$ denotes the perceived conversion cost incurred by consumers switching from the social platform to the e-commerce platform for product searching and purchasing. When $U_k^i > 0$, social platform users can be converted into potential market customers. Therefore, we can express the number of potential consumers contributed by social platform users in each of the two cases of sharing and non-sharing as $d_f^s = \left(1 - \frac{1}{2(1+\Delta v)}\right)\beta + \frac{1}{2}m\theta$ and $d_f^n = \left(1 - \frac{1+2t}{2(1+\Delta v)}\right)\beta + \left(\frac{1}{2} - t\right)m\theta$, respectively.

2 Analysis

This section first examines the optimal marketing effort level of a manufacturing firm with owned social media and then compares the optimal firm profit under sharing and non-sharing of the product link. Furthermore, we discuss the correlation between the fan count of the firm's self-media account, fan effect, marketing effort influence, product price, perceived conversion cost, and the firm's decision-making behaviors.

2.1 Equilibrium analysis

To further reassure the plausibility of the solution, we suppose $p < \min\left\{\frac{(1+2\Delta v-2t)\beta}{2(1+\Delta v)}, 1\right\}$. In reality, if the product price is higher, market demand will be less than zero, which makes no sense. For computational simplicity and without affecting the model's conclusions, we set $c = 1$ in the subsequent calculations. The manufacturing firm with its own social media chooses the marketing effort level that will maximize its profit. By solving the first-order condition $\frac{\partial \pi_i}{\partial \theta_i} = 0$, we compute the equilibrium marketing effort level θ_i^* in the two cases of sharing and non-sharing of the product link, as shown in Proposition 1. Then, substituting the equilibrium θ_i^* into Eqs. (1) to (4), as appropriate, yields the equilibrium market demand contributed by social platform users D_f^{i*} and the firm profit π_i^* in the two cases of sharing and non-sharing of the product link. Corollaries 1-3 can be obtained by deriving the equilibrium results.

Proposition 1 In the case of a manufacturing firm with owned social media sharing the product link, the equilibrium results are as follows:

$$\theta_s^* = \frac{mp(1-\delta)}{2}$$

$$D_f^{s*} = \frac{2\beta + 4\beta\Delta v - p(1+\Delta v)(4 + m^2(1-\delta))}{4(1+\Delta v)}$$

$$\pi_s^* = \frac{p(8(1+\Delta v) + p(1+\Delta v)(8(-2+\delta) + m^2(1-\delta)^2) + 4\beta(1+2\Delta v)(1-\delta))}{8(1+\Delta v)}$$

In contrast, for the manufacturing firm with owned social media not sharing the product link, the equilibrium results are as follows:

$$\theta_n^* = \frac{mp(1-2t)}{2}$$

$$D_f^{n*} = \frac{1}{4}\left(p(-4 + m^2(1-2t)^2) + \frac{2\beta(1-2t+2\Delta v)}{1+\Delta v}\right)$$

$$\pi_n^* = \frac{1}{8}p\left(m^2p(1-2t)^2 + 8\left(1 - 2p + \beta - \frac{\beta + 2t\beta}{2+2\Delta v}\right)\right)$$

Corollary 1 The relationship between θ_i^*, D_f^{i*}, π_i^* and β, Δv, m in the two cases of sharing and non-sharing of the product link by the manufacturing firm with owned social media satisfies

1) θ_i^* is independent of β and Δv, but is increasing with m;

2) D_f^{i*} and π_i^* are increasing with m, β, and Δv.

Corollary 1 demonstrates that, first, as the marketing effort influence increases, the marketing effort level, market demand contributed by social platform users, and firm profit will also increase. When the firm's self-media account exports a product-related blog on the social platform, the greater the marketing effort influence, the higher the business value of a unit marketing effort.

Therefore, the firm is more willing to increase its marketing efforts. At this point, the number of potential consumers diverted from the social platform to the e-commerce platform will increase, thereby raising the market demand contributed by social platform users and firm profit. The marketing effort influence is related to the size of the user traffic on the social platform: the larger the user traffic, the greater the marketing effort influence. Therefore, when a manufacturing firm conducts self-media marketing, if the user traffic of the social platform chosen for marketing is higher, the company should invest more marketing efforts to increase revenue.

Second, as the fan count grows and the fan effect improves, so will the market demand contributed by social platform users and the firm profit. This is because more fans imply more users who have viewed the product-related blog on the social platform, and a stronger fan effect increases the likelihood of converting the viewed fans into potential customers. As a result, the manufacturing firm should cultivate fans for its self-media account from both "quantity" and "quality" perspectives, such as by strengthening the interaction with users on the social platform.

Corollary 2 When the manufacturing firm with its own social media shares the product link, the relationship between θ_s^*, D_f^{s*}, π_s^* and δ, p satisfies

1) θ_s^*, D_f^{s*}, and π_s^* are decreasing with δ;

2) θ_s^* is increasing with p;

3) When $m^2 < \frac{4}{1-\delta}$, D_f^{s*} is decreasing with p; otherwise, D_f^{s*} is increasing with p;

4) When $m^2 < \frac{2}{(1-\delta)^2}\left(4+(1-\delta)\left(4-\frac{\beta(1+2\Delta v)}{p(1+\Delta v)}\right)\right)$ and $\beta < \frac{4\delta(1+\Delta v)}{(1-\delta)(1+2\Delta v)}$ are satisfied, if $t \leqslant \frac{3}{8}$, or $t > \frac{3}{8}$ and $\delta \geqslant \frac{8t-3}{4t-1}$, or $t > \frac{3}{8}$, $\delta < \frac{8t-3}{4t-1}$, and $\Delta v > \frac{2(2t-1)-(1-\delta)(1-4t)}{2(3-\delta)}$ continues to be satisfied, a threshold value $p_s^* = \frac{(1-\delta)(1+2\Delta v)\beta}{4\delta(1+\Delta v)}$ ($0 < p_s^* < \min\left\{\frac{(1+2\Delta v-2t)\beta}{2(1+\Delta v)}, 1\right\}$) exists; when $p > p_s^*$, π_s^* is decreasing with p; conversely, π_s^* is increasing with p. In the absence of the above conditions, π_s^* is always increasing with p.

In Corollary 2, we see that, in the case of sharing a product link, as the social platform commission rate increases, the marketing effort level, market demand contributed by social platform users, and firm profit will decrease. As the commission rate rises, the manufacturing firm receives less of the business value generated by users who have viewed the product-related blog on the social platform, resulting in a decrease in the effectiveness of marketing output. Hence, the manufacturing firm's marketing effort will be reduced. At this point, the number of potential consumers diverted from the social platform to the e-commerce platform will also decrease, thus lowering market demand contributed by social platform users and firm profit. As a result, if the manufacturing firm shares the product link, it should invest more marketing efforts if the social platform charges a lower commission rate.

Moreover, although the marketing effort level rises as the product price rises, the market demand contributed by social platform users and the firm profit do not always rise in tandem. First, as the product price increases, the business value created by social platform users attracted by a unit marketing effort rises, so the firm is more willing to increase the marketing effort level. Second, when the influence of marketing efforts is small, the market demand contributed by social platform users decreases as the product price increases. Conversely, when the marketing effort influence is large, the market demand contributed by social platform users increases with the product price. This is because when the marketing effort influence is small, as the product price rises, the marketing effort level rises at a slower rate, resulting in a slower growth rate of the number of potential consumers diverted from the social platform to the e-commerce platform. In comparison, the reduction in the number of potential consumers caused by the product price increase is greater at this point. When marketing effort has a large influence, the decrease in the number of potential consumers due to a price increase is smaller than the increase in the number of potential consumers due to a decrease in marketing effort level. Third, we present the following three conditions: 1) a low perceived conversion cost; 2) a high perceived conversion cost and a large commission rate set by the social platform; and 3) a high perceived conversion cost, a small commission rate set by the social platform and a strong fan effect. If one of these three conditions is met under the condition that the firm has a low marketing effort influence and a low number of fans on its self-media account, when the firm's product price exceeds a certain value, then the firm's profit will decrease as the price increases.

However, if the above conditions are not met, the firm profit will always rise in tandem with the product price. Therefore, for the manufacturing firm with its own social media, many factors, such as fan count on owned social media, must be considered when pricing the product. When the fan base is small, the higher product price results in a lower firm profit.

Corollary 3 When the manufacturing firm with its own social media does not share the product link, the relationship between θ_n^*, D_f^{n*}, π_n^* and t, p satisfies

1) θ_n^*, D_f^{n*}, and π_n^* are decreasing with t, respectively;

2) θ_n^* is increasing with p;

3) When $m^2 < \frac{4}{(1-2t)^2}$, D_f^{n*} is decreasing with p; otherwise, D_f^{n*} is increasing with p;

4) When $m^2 < \min\left\{12 - \frac{2\beta(1-2t+2\Delta v)}{1+\Delta v}, 12 - \frac{8(1+\Delta v)}{(1-2t+2\Delta v)\beta}\right\}$ and $\frac{2(1+\Delta v)}{3(1-2t+2\Delta v)} < \beta < \frac{6(1+\Delta v)}{1-2t+2\Delta v}$ are satisfied, there is a threshold value $p_n^* = \frac{4(1+\Delta v)-\beta(2-4t+4\Delta v)}{(16-m^2(1-2t)^2)(1+\Delta v)}$ $\left(0 < p_n^* < \min\left\{\frac{(1+2\Delta v-2t)\beta}{2(1+\Delta v)}, 1\right\}\right)$; when $p > p_n^*$, π_n^* is decreasing with p; conversely, π_n^* is increasing with p. Without the above condition, π_n^* is always increasing with p.

Corollary 3 indicates that in the case of the manufacturing firm not sharing the product link, the marketing effort level, market demand contributed by social platform users, and firm profit will all decrease as the perceived conversion cost rises. Consequently, social platform users attracted by a unit marketing effort are less likely to convert into potential consumers, resulting in a decrease in the number of potential consumers on the social platform who can be diverted to the e-commerce platform, which reduces marketing output effectiveness. Therefore, the firm will reduce its marketing effort level, resulting in a lower firm profit.

Second, as the product price rises, so will the marketing effort level, but market demand contributed by social platform users and firm profit do not always rise in tandem. On the one hand, there is a marketing effort influence threshold value below which market demand contributed by social platform users decreases with product price; on the contrary, market demand increases with product price. In the case of a firm with a low level of marketing effort influence and a medium fan count, on the other hand, the firm's profits will decrease as the product price rises above a certain point and increase as the price rises below that point. In other cases, however, raising the price of a product will always increase the firm's profit. As a result, manufacturing firms with their own social media will need to consider a variety of factors when pricing their products, such as marketing effort influence. When the influence is low, a higher product price results in a lower firm profit.

Corollary 4 In the case of sharing the product link, p_s^* is increasing with β; in the case of non-sharing of the product link, p_n^* is decreasing with β.

According to Corollary 2, when the marketing effort influence and fan count are smaller, we present the following three conditions: 1) a low perceived conversion cost; 2) a high perceived conversion cost and a large commission rate set by the social platform; and 3) a high perceived conversion cost, a small commission rate and a strong fan effect. If one of these three conditions is met, the threshold p_s^* value denotes the optimal product price in the case of the manufacturing firm with own social media sharing the product link. According to Corollary 3, when the marketing effort influence is small, and the fan count is medium, the threshold value p_n^* denotes the optimal product price when the product link is not shared. Moreover, Corollary 4 posits that under the above conditions, as the fan count grows, the optimal product price in the case of sharing (non-sharing) the product link increases (decreases). Therefore, when the manufacturing firm is pricing the product, "the greater the number of fans on owned social media, the higher the pricing" is not always the case.

2.2 Contrastive analysis

Comparing the marketing effort level, market demand contributed by social platform users, and firm profit in the two cases of sharing and non-sharing of the product link yields Propositions 2-4.

Proposition 2 When $t \geqslant \delta/2$, $\theta_s^* \geqslant \theta_n^*$; when $t < \delta/2$, $\theta_s^* < \theta_n^*$.

Proposition 2 shows that when the perceived conversion cost is high, the marketing effort level when sharing the product link is always greater than when not sharing. Otherwise, the marketing effort level is always lower when the product link is shared than when it is not shared. This is because the manufacturing firm's marketing effort level decreases as the perceived conversion cost increases when the product link is not shared, whereas the marketing effort level remains constant when the product link is shared. Therefore, when the perceived conversion cost exceeds a certain threshold, the marketing effort level in the case of not sharing the product link is lower than that of sharing.

Proposition 3 When $\delta \leqslant 4t(1-t)$, or $\delta > 4t(1-t)$ and $m^2 \leqslant \frac{4t\beta}{p(1+\Delta v)(4(t-1)t+\delta)}$, $D_f^{s*} \geqslant D_f^{n*}$; when $\delta > 4t(1-t)$ and $m^2 > \frac{4t\beta}{p(1+\Delta v)(4(t-1)t+\delta)}$, $D_f^{s*} < D_f^{n*}$.

According to Proposition 3, we present the following two conditions: 1) a low commission rate set by the social platform; and 2) a high commission rate and a low marketing effort influence. If one of these two conditions is met, the market demand contributed by social platform users in the case of sharing the product link is greater than that in the non-sharing. In contrast, when the commission rate is high, and the marketing effort influence is large, the market demand contributed by social platform users when sharing the product link is lower than when not sharing. The number of potential customers converted from fans on the firm's owned social media is higher in the case of sharing (vs. non-sharing) the product link.

However, when the commission rate is higher, the number of potential consumers converted from general users on the social platform is lower when the product link is shared versus when it is not shared. This is because when the commission rate is high, in the case of sharing the product link, the firm will reduce the marketing effort level, attracting fewer regular users on the social platform. The gap between the numbers of potential consumers converted from general users on the social platform in the two cases is larger at this time, when the marketing effort influence is greater. When this gap is larger than the gap between the number of potential consumers converted by fans, the market demand contributed by social platform users in the case of sharing the product link is smaller than that contributed by non-sharing.

Proposition 4 There exists a threshold value of the commission rate $\Omega = \frac{1}{2m^2 p}\left(8p + 4\beta\left(-2 + \frac{1}{1+\Delta v}\right) + \left(\left(8p + 4\beta\left(-2 + \frac{1}{1+\Delta v}\right)\right)^2 - 4m^2 p\left(8p - m^2 p(1-2t)^2 - \frac{4\beta(1-2t+2\Delta v)}{1+\Delta v}\right)\right)\right)$ $(0 < \Omega < 1)$; when $\delta \leqslant \Omega$, $\pi_s^* \geqslant \pi_n^*$; when $\delta > \Omega$, $\pi_s^* < \pi_n^*$.

According to Proposition 4, there exists a threshold value that determines whether or not the manufacturing firm shares the product link. When the commission rate is less than the threshold value, the firm shares the product link; otherwise, the firm does not share. As the commission rate rises, the difference between the business revenue of the additional potential consumers caused by sharing the product link and the cost of commissions shrinks. When the commission rate exceeds the threshold value, the revenue from sharing the product link is insufficient to cover the cost of commissions, so the manufacturing firm will not share the product link.

As the threshold value that determines whether the manufacturing firm shares the product link is complex, drawing intuitive conclusions is difficult. Therefore, this section further analyzes the impact of important model parameters, such as the fan effect and the perceived conversion cost, on the threshold value through numerical simulations. Specifically, the parameters in numerical simulations under cases 1, 2, 3, 4, 5, and 6 are, respectively, $\beta = 1$, $p = 0.2$, $t = 0.1$, $m^2 = 0.2$; $\beta = 2$, $p = 0.4$, $t = 0.2$, $m^2 = 0.3$; $\beta = 0.6$, $p = 0.1$, $t = 0.3$, $m^2 = 0.5$; $\beta = 1$, $p = 0.1$, $m^2 = 0.2$, $\Delta v = 0.2$; $\beta = 2$, $p = 0.4$, $m^2 = 0.3$, $\Delta v = 0.5$; $\beta = 0.6$, $p = 0.2$, $m^2 = 0.5$, $\Delta v = 1$. Moreover, the fan effect Δv and the perceived conversion cost t vary in the range of $[0, 1]$ and $[0, 0.5]$, respectively. Accordingly, we obtain Fig. 2, leading to Corollary 5.

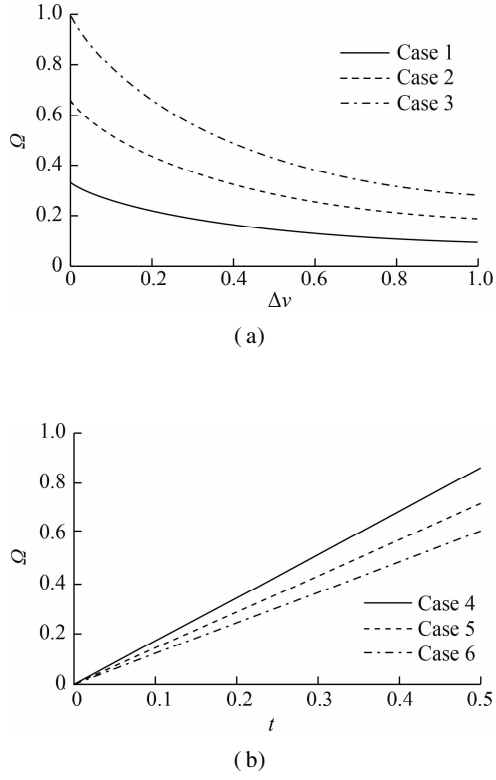

Fig. 2 Factors influencing the threshold value of the commission rate. (a) Fan effect Δv; (b) Perceived conversion cost t

Corollary 5 In the case of the manufacturing firm sharing the product link, Ω is decreasing with Δv, but increasing with t.

Corollary 5 demonstrates, first, that as the fan effect diminishes, the possibility that the manufacturing firm shares the product link increases because of the following reasons. The likelihood of converting fans of the firm's self-media account into potential consumers is an important factor influencing the firm's decision to share the product link, and this converting probability is higher in the case of sharing than in the case of not sharing. The greater the difference between the converting probabilities of the two preceding cases, the more willing the firm is to share the product link. The waning fan effect increases the difference in converting probabilities, and the firm becomes more motivated to share the product link, thereby increasing the possibility of the firm sharing the product link.

Secondly, as the perceived conversion cost rises, so does the likelihood that the manufacturing firm will share the product link. The following is an explanation. When the product link is shared, the likelihood of converting social platform users who have viewed the product-related blog to potential consumers on the e-commerce platform is higher than when it is not shared. Due to the increased perceived conversion cost, the gap between the converting probabilities in the preceding two cases will widen, increasing the incentives for the firm to share the product link and increasing the likelihood that it will do so. The

size of the perceived conversion cost is closely related to the convenience of the product link's functionality. In short, the easier it is for consumers to use the product link, the higher the perceived conversion cost. Therefore, promoting the product link by continuously optimizing its functionality is more beneficial for the social platform.

3 Conclusions

1) This study develops a mathematical model to examine a manufacturing firm's decision on marketing effort level and whether to share the product link or not when its self-media account publishes a product-related blog. Moreover, we discover that the firm profit increases as the fan count and the fan effect increase. Further, when the commission rate is low, the firm shares the product link. Intriguingly, as the fan effect diminishes and the perceived conversion cost increases, so does the likelihood of the firm sharing the product link.

2) This study also contributes to the literature on manufacturing firm decision behaviors with owned social media by capturing the fan effect and the perceived conversion cost. It presents the following major managerial implications. To conduct self-marketing, the manufacturing firm should select the appropriate social platform. Manufacturing firms' owned social media should cultivate fans from both "quantity" and "quality" perspectives. Moreover, social platforms should focus more on improving the user experience when designing the product link.

3) Our analysis has limitations; for example, we only consider one manufacturing firm with own social media. Therefore, future research will focus on whether competing manufacturing firms with own social media platforms should share the product link.

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考虑粉丝效应的制造企业自媒体上产品链接分享决策

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摘要:分别针对制造企业自媒体上分享和不分享产品链接,考虑粉丝效应,构建优化模型,分析并比较2种情形下的营销努力和收益.研究表明:当社交平台抽成比例较低时,企业选择分享产品链接;反之,则选择不分享产品链接.随着粉丝效应的减弱和感知转换成本的提高,企业更有可能分享产品链接.无论企业是否分享产品链接,营销努力总是随产品价格的增加而提高;但企业利润并不总是随产品价格的增加而提高,而是随粉丝效应的增强和自媒体账号粉丝数量的增多而提高.当企业分享产品链接时,营销努力和企业利润随社交平台抽成比例的提高而降低;当企业不分享产品链接时,营销努力和企业利润随感知转换成本的提高而降低.因此,建议企业增强自媒体账号的影响力,吸引更多优质粉丝;同时,建议社交平台优化产品链接功能,让更多企业选择分享产品链接.

关键词:粉丝效应;自媒体营销;产品链接;营销努力

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