Analysis of the Opportunistic Risk Control of Star Spokesmen Based on the KMRW Model

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Abstract: With the advent of the digital age, the role of celebrity endorsements in promoting product sales continues to expand. To cater to the trend of the new era and achieve a win-win situation in a highly competitive market, most companies adopt the marketing method of celebrity endorsements. However, due to information asymmetry, celebrity endorsements also bring moral hazards, hazards the celebrity's reputation, and seriously jeopardize the corporate reputation. Therefore, this paper analyzes the opportunism of celebrity endorsement by establishing the KMRW reputation model. The research shows that reputation can curb the opportunistic behavior of celebrity endorsers.

1. Introduction

Celebrity endorsement is not uncommon, especially with the advent of the digital era, big data has incubated a large number of traffic stars. The brand pays attention to the popularity of stars and their huge influence on the fan groups and expects that celebrity endorsement can bring them huge profits and enhance the brand's influence. At the same time, stars can also monetize their traffic through brand endorsement, further enhance their influence among the consumers of the brand, and achieve traffic expansion and monetization. From the original point of view of both sides of the cooperation, the model should be a win-win. But is the result necessarily as perfect as the company presupposes?

In recent years, there have been frequent star "moral loss problems m. Stars may have a halo effect, but first, they are human beings. No one is perfect, some of them inevitably have moral problems, and because stars are often professionally trained and capable of maintaining or disguising their true faces, it is difficult for the public or enterprises to distinguish their true faces. Second, celebrities are not ordinary people. Driven by public curiosity and followed by various media outlets, they have little privacy. When the "immoral" problem is exposed, the social influence tends to change positively with the popularity of stars. From this point of view, the brand spokesperson is a double-edged sword. When the star endorsement creates huge benefits for the enterprise, the star endorsement enterprise will suffer losses and even face a greater reputation crisis once the star "loses morality" problem occurs.

Then, in the case of information asymmetry, how can enterprises make profits from celebrity

endorsement as much as possible, and how can enterprises avoid the loss caused by the moral hazard of stars' "loss of morality" as much as possible? This paper analyzes the opportunism of celebrity endorsement from the KMRW reputation model and puts forward some suggestions on how to avoid the opportunism risk.

2. Relevant Theories and Concepts

2.1. Information Asymmetry Theory

The theory of information asymmetry means that sellers in a market have more information about the quality of products and services than buyers. The party with more information would often take advantage of the information advantage to gain benefits from the party with less information. As early as 1970, Gerge [1] explained that information asymmetry would lead to adverse selection and moral hazard, and adverse selection would lead to bad money driving out good money, forming a "lemon market".

Information asymmetry exists widely in the celebrity endorsement market. The information asymmetry between endorsement companies and celebrity spokesmen is determined by the professional characteristics of stars. Endorsement enterprises cannot judge the merits and demerits of spokesmen through the external performance of stars, such as reviews, traffic, business level, etc. Even after signing the contract to use spokesmen, there may be risks such as spokesmen existing or hiding "moral loss". Moreover, stars are often professionally trained, and they often create "human features" that are acceptable to the public. In addition, the brokerage companies of stars often carry out crisis public relations in advance, making it difficult for some negative news to spread. Therefore, it is more difficult for endorsement companies to judge the influence brought by spokespeople on enterprises.

In addition, endorsement companies have limited capacity for background checks. The purpose of choosing celebrities for endorsement is to enhance product popularity and sales. However, their understanding of the celebrity industry is limited, so it is more difficult to know the true face of their spokesmen. Darby et al. [2~6] divided the quality information of products into three categories according to different degrees of difficulty for consumers to obtain asymmetric information: "search product" attribute, "experience product" attribute, and "trust product" attribute." Search product" refers to the quality information that consumers can understand before buying products, and the information that buyers can judge through their senses. "Experience product" refers to the quality information that consumers can understand only after purchasing and using the product, and "credit product" refers to the quality information that consumers cannot understand even after purchasing and using the product. According to Darby et al. [2-6] classification of the quality of product information, one can know a star spokesperson's both experience and letter product characteristics, thus in the star endorsement market, there is a serious information asymmetry problem.

2.2. Reputation Theory

Reputation theory is to alleviate information asymmetry in the market, one of the important ways to control adverse selection, reputation mechanism is used to alleviate the information asymmetry in the market, and improve the efficiency of informal institutional arrangement. Sun Xia et al. [7-11] pointed out that when the buyer is faced with information asymmetry, with the involvement of a third party, the buyer will judge the quality of the seller's products or services based on the seller's reputation. Therefore, as long as a reliable reputation mechanism is established, under the supervision of a third party, the reputation mechanism can play a role in the trust product market. In economics, the standard reputation theory was established by Kreps et al. [10-14], who used the

game model to study the generation mechanism of cooperative equilibrium in finite repeated games with incomplete information. For the first time, a standard reputation model (KMRW model) was established in economics. This model, also known as the "Gang of Four" model, mainly expounds that reputation, as a kind of "cognition", will have an impact on people's behavioral decisions, and "reputation benefits" do exist. The theorem is pointed out that in the T stage repeated prisoner's game, each player has a nonzero probability is "irrational", did not know each other and type, if T is large enough, there must be a $T_0 < T$ in all no greater than T_0 the phase of the game, players choose cooperation. The standard reputation model proves that incomplete information about the player's payment function to other players or the strategic space has a significant impact on the equilibrium outcome, as long as the game is repeated enough times. Cooperative behavior also occurs in a finite number of games.

2.3. Analysis of the KMRW Model on the Opportunistic Risk Control of Star Spokesmen

In the actual market transaction process, the information of buyers and sellers is often incomplete. Consumers, cannot fully grasp the quality information of the purchased products or services. As a result, it is impossible to tell whether the producer is providing a high-quality product or a low-quality product. In this case, the buyer will often through the market or the third party to find information about the counterparty's reputation, according to each other have good reputation, and decide to cooperate or not. Usually, limited rational buyers will choose to cooperate with reputable sellers, and will continue in future trade cooperation by observing the behavior of the transaction object, according to the observed signal changing the view of the transaction object. Thus it can be seen that reputation plays a huge role in the asymmetric information market.

3. Model Analysis and Research Hypothesis

3.1. Model Assumption

Before the game, let's assume the game conditions:

Firstly, assume that the game is promoted enterprise and celebrity spokesperson. The behaviors of celebrity spokesmen can be divided into two categories: candid and non-candid. Non-candid celebrity spokesmen will take opportunistic behaviors and damage the interests of the endorsing enterprises. They will decide whether to be candid or not according to the public opinion environment.

Secondly, both endorsement enterprises and star spokesmen belong to the "rational man" in economics.

Thirdly, before the endorsement will be according to the star spokesperson one phase behavior of judging the type of celebrity spokesperson, once found a non-cooperative behavior star spokesperson, immediately stop trading, termination and never use the spokesperson.

Table 1: Star spokesperson and endorsement enterprise behavior selection table

Behavior	Frank	The confession
Cooperation	√	
Don't cooperate		√

By the above assumptions, we can list will endorsement of a celebrity spokesperson and corporate behavior such as in Table 1.

The category of celebrity spokespersons is denoted by c, c=0 means candid spokespersons, they do not exist or conceal "bad morals"; c=1 means non-candid spokespersons, they have opportunistic tendencies. s represents the probability $s \in (0,1)$ t t the celebrity spokesperson chooses not to cooperate, and s_e represents the probability $s_e \in (0,1)$ that the endorsement enterprise expects the celebrity spokesperson to take opportunistic behavior. Assume that the single-stage utility function of the government is Eq. (1):

$$U = -0.5s^2 + c(s - s^e) \tag{1}$$

In a single-stage game, derivation of equation (1) can be obtained:

$$\frac{\partial U}{\partial R} = 1 - s \tag{2}$$

Therefore, to maximize the interests of celebrity spokespersons, they must make $s = c = 1$, that is, they must choose opportunistic behaviors. At this time $U_{max} = 1/2$. Therefore, in a single-stage game, there is no need for rational non-confessional celebrity spokespersons to maintain their reputations.

Assume that the prior probability of c=0 is p_0, that is, the prior probability that the producer is honest is p_0. Then the prior probability of c=1 is $1 - p_0$. The game repeats the T stage, y_t is the probability that the celebrity spokesperson chooses to maintain his reputation in the t stage, and the probability that he does not do "bad morals", and x_t is the endorsement company. The probability that celebrity spokespersons will not implement opportunism. Then, in equilibrium, $y_t = x_t$. If in stage T, assume that the prior probability of c=0 is p_0, that is, the prior probability that the producer is honest is p_0. Then the prior probability of c=1 is $1 - p_0$. The game repeats the T stage, y_t is the probability that the celebrity spokesperson chooses to maintain his reputation in the t stage, and the probability that he does not do "bad morals", and x_t is the endorsement company. The probability that celebrity spokespersons will not implement opportunism. Then, in equilibrium, $y_t = x_t$. If in the T stage, the endorsement company does not find that the celebrity spokesperson has "immoral" behavior, according to Bayes' rule, the posterior probability that the endorsement company considers the celebrity spokesperson to be frank in the $t + 1$ stage is: According to the Bayesian rule, the posterior probability of endorsement companies that the celebrity spokesperson is a frank type in the $t + 1$ stage is:

$$(p_{t+1} (c = 0 | s_t = 0) = \frac{P(c=0, \ s_t=0)}{P(s_t=0)} = \frac{p_t \times 1}{p_t \times 1 + (1-p_t) x_t} \geq p_t \tag{3}$$

Among them, p_t is the probability that the celebrity spokesperson is a confession type at stage t, and the probability that the celebrity spokesperson is a non-confessional type is $1 - p_t$. 1 is the probability that a candid celebrity spokesperson chooses to maintain a good reputation. That is to say, if the celebrity spokesperson does not implement opportunistic behavior in the t stage, then the probability that the endorsement company believes that the celebrity spokesperson is a candid type will increase in the t+1 stage. If the celebrity spokesperson makes it choose opportunism to exist or conceal "unvirtuous" behavior at t, then it is deduced that:

$$p_{t+1}(c = 1 | s_t = 1) = \frac{P(c=0, \ s_t=1)}{P(s_t=1)} = \frac{p_t \times 0}{p_t \times 0 + (1-p_t)x_t} = 0 \tag{4}$$

Formula (4) shows that once the celebrity spokesperson takes opportunistic behavior, the endorsement company will think that the celebrity spokesperson is not candid, and will terminate the contract and not cooperate.

Next, let's analyze the solutions of the T-1 and T stage models.

First of all, assuming that the T stage is the final stage of the transaction, it is no longer meaningful for a rational celebrity spokesperson to choose not to hide in the final stage to maintain their reputation. Therefore, celebrity spokespersons will choose to be opportunistic. His optimal choice is $s_t = c = 1$, and the expected judgment of the endorsement company on the honest type of the celebrity spokesperson is $s_t^e = 1 - p_t$. At this time, the utility level of the endorsement company is:

$$U = -\frac{1}{2}s_t^2 + (s_t - s_t^e) = -\frac{1}{2} + [1 - (1 - p_t)] = p_t - \frac{1}{2} \tag{5}$$

Derivation:

$$\frac{\partial U_T}{\partial R_T} = 1 > 0 \tag{6}$$

It can be seen that the utility of non-confessional celebrity endorsers in the final stage is an increasing function of reputation, which is why celebrity endorsers are motivated to build reputation. If the celebrity endorser behaves opportunistically before the final stage, the non-confessional type will be debunked and nothing will be gained.

Second, analyze the sum of utility in T-1 stage and T stage when producers implement opportunistic behavior and do not implement opportunistic behavior respectively in T-1 stage. Suppose the discount factor is delta. If the dishonest producer chooses opportunistic behavior in stage T-1, $y_t - 1 = 0$, then $s_t - 1 = 1, p_T = 0$. That is to say, if the endorsement company observes that the celebrity endorser has taken opportunistic behavior in the T-1 stage, it will consider it to be non-candid in the T stage. A given consumer's expectation that the celebrity spokesperson is a confession type at the T-1 stage is s_{T-1}^e.

Then the total utility of the producer in stages T-1 and T is:

$$U_{T-1}(s_{t-1} = 1) + \delta\, U_T(s_t = 1)$$
$$= -\frac{1}{2}s_{t-1}^2 + (s_{t-1} - s_{t-1}^e) + \delta\left[-\frac{1}{2}s_t^2 + (s_t - s_t^e)\right] \tag{7}$$

If the non-confessional celebrity spokesperson chooses to confess his behavior in the t-1 stage, the total utility of the non-confessional celebrity spokesperson in the t-1 and t stages is:

$$U_{T-1}(s_{t-1} = 0) + \delta\, U_T(s_t = 1) = -\frac{1}{2}s_{t-1}^2 + (s_{t-1} - s_{t-1}^e) + \delta\left[-\frac{1}{2}s_t^2 + (s_t - s_t^e)\right] \tag{8}$$

So, is there a way to confess star spokesman also choose cooperative behavior? Under the setting of rational man, star spokesmen pursue the maximization of their interests. So, to make the star spokesperson tooperate, you will need to discuss how to make its biggest utility? Under the model, then we need to discuss what conditions can make $U\,(s_{t-1} = 0) \geq U\,(s_{t-1} = 1)$.

That is:

$$-s_{t-1}^e + \delta\left(p_t - \frac{1}{2}\right) \geq -\frac{1}{2} - s_{t-1}^e - \frac{1}{2}\,\delta \tag{9}$$

That is:

$$p_t \geq \frac{1}{2\,\delta} \tag{10}$$

Because in the equilibrium situation, the endorsement company's expectation of whether the celebrity spokesperson is frank is equal to the choice of whether the celebrity spokesperson is frank. At this time, it can be known from the formula (3), $p_{t-1} = p_t$, then (10) can be transformed into:

$$p_{t-1} \geq \frac{1}{2\delta} \qquad\qquad (11)$$

Equations (10) and (11) illustrate that if the endorsement company believes that the probability that the celebrity spokesperson is an honest type is not less than $1/2\delta$ in the T-1 stage, the non-confessional celebrity spokesperson will hide their non-confessional identity, thereby Work hard to maintain your reputation. Moreover, the higher the reputation of the celebrity spokesperson, the higher the enthusiasm for maintaining the reputation. Conversely, if the celebrity endorser has a bad reputation, or is found to be taking opportunistic behavior at some stage. Then, such celebrity spokespersons will no longer maintain their reputation, and the probability of their violations will be greater.

4. Conclusions and Recommendations

4.1. Conclusion

Models show, star spokesperson to endorse the reputation of the enterprise to send signals, as well as the reputation of celebrity spokesperson the reputation of total utility, that is star spokesperson reputation for establishing and maintaining cost and reputation losses after the sum of celebrity spokesperson whether choose to stick to the bottom line, don't do and don't hide "misconduct" behavior is crucial:

4.1.1. Reputation Can Bring Long-Term Benefits to Star Spokesmen

The endorsement enterprises judge whether star spokesmen are frank or not according to their trading behavior in the previous stage. As a result, even celebrity spokesmen who are not candid tend to disguise themselves as candid spokesmen in order to gain long-term profits.

4.1.2. The Behavior of Star Spokesmen in the Previous Stage will Affect the Establishment of Their Future Reputation

The cost of maintaining reputation is lower than that of establishing reputation. Therefore, producers with high reputation are more active in maintaining reputation. This is also the reason why the "moral misconduct" of celebrity spokesmen with good reputation is rarely exposed, and once problems occur, they will try their best to solve them.

4.1.3. The "Punishment Effect" and "Incentive Effect" of Reputation Play a very Important Role

The severe degree of punishment "misconduct" artists and entertainers of having both ability and political integrity of the incentive degree can affect the behavior of the celebrity spokesperson. Reputation, as an effective supplementary means of government regulation, depends on the joint efforts of endorsement enterprises, celebrity spokespersons and the government. First of all, endorsement enterprises should have the initiative to obtain corporate reputation information, comprehensively search for positive and negative information about celebrity spokespersons, do a good background investigation, and investigate the prospective spokespersons through corporate contacts and professional entertainment companies. Secondly, stars should take the initiative to establish and maintain their reputation, and spread their reputation information to endorsement enterprises and government regulatory authorities through various communication channels. At the same time, but also to cherish their own feathers as their own long-term strategic goal to catch. Finally, government intervention is crucial for the role of reputation. In view of the fact that

celebrity reputation is not easy to be perceived through media supervision, and stars themselves have received professional training and generally have beautiful personnel, it is difficult for endorsement enterprises and the public to obtain comprehensive information about celebrity spokespersons. The government should build a bridge to connect celebrity spokespeople and their companies. Without infringing the star himself under the premise of privacy and business secrets, and easy access to public in an enterprise in time, easy to form of perception, relevant reputation information dissemination to the public and endorsement enterprises, such as through the mainstream Chinese art association, the organization or the mainstream media to star background investigation and promptly announced regularly, setting up star red list, etc. In this way, we can give full play to the role of reputation and curb the opportunistic behavior of star spokesmen.

4.2. Suggestions

Through the above analysis, this paper draws the following conclusions: reputation is an informal institutional arrangement to alleviate market information asymmetry and contract incompleteness, and the signal display effect of reputation can inhibit the opportunistic behavior of star spokesmen. Considering the long-term and repeated game between star spokesmen and government supervision, it is an effective way to restrain the opportunistic behavior of star spokesmen by preventing stars and their management companies from propagating false reputational information and letting endorsement companies and the public know whether stars have "immoral" behavior.

To sum up, this paper puts forward the following suggestions:

4.2.1. Broaden the Channels of Celebrity Reputation Communication and Establish a Multi-Dimensional Information Disclosure System

First, to confirm the star of the "misconduct" information, government departments through the authoritative media and government official endorsement of a channel to the public as well as companies such as public official release star "misconduct" information, to ensure the full disclosure and dissemination of information, to ensure public right to know about star "misconduct" behavior, lead the public opinion direction. Secondly, the government can also establish a "negative list" of the entertainment industry to expose the "immoral" behavior of stars and force star artists to strive to maintain their reputation, thus increasing the total utility of reputation.

4.2.2. Strengthen the Punishment of "Immoral Artists" and Increase the Cost of "Immoral" Stars

In many cases of celebrities' moral misconduct in China, these incidents ended with apologies from the stars and termination of contracts with the endorsement companies. Even, after a period of time, these lost artists can come back. These costs are minuscule compared to the benefits that artists can get from endorsements and non-confessional acts. Therefore, on the one hand, for the star criminal incidents, the relevant departments need to pay attention to, the trial can choose the appropriate open way, equally deal with the star illegal cases; On the other hand, the government should name and criticize the "immoral" artists, take joint disciplinary measures for the illegal and immoral star artists, unify the standards of the whole network, and strictly prevent the illegal and immoral star artists from shifting positions and "curve comeback".

4.2.3. Strengthen the Cultivation of the Virtues of Artists and Strengthen the Reputation Awareness of Stars

In recent years, the rise of traffic stars has made the public aware that the threshold for entertainment and Internet celebrities is getting lower and lower. The trend of stars with low education level and younger age makes it more likely that artists will act "violently". Therefore, first of all, relevant departments should introduce policies to limit the minimum age for stars to make their debut, guide teenagers to receive education, and sort out correct values and career views. Secondly, for the artists with signs of violation of the unified management, they are required to accept the State Administration of Radio, film and television "moral class" education, in order to play a warning role to prevent further violations; Finally, the mainstream media should promote more positive ideas such as "artists should cherish their feathers more", so as to encourage artists to pay more attention to their reputation and hold high the banner of self-supervision.

4.2.4. Improve the Ability of Enterprises to Identify the Reputation Information of Star Spokesmen

When choosing spokesmen, enterprises should consider the artist's artistic ethics and the power of example, rather than just looking at the artist's popularity. When Zhang Zhehan, an entertainer who was criticized by People's Daily Online for "hurting national feelings," became popular because of just one drama, more than a dozen brands ignored the "stain" and invited him to be their spokesperson. This phenomenon is easy to set a wrong example for minors, making them ignore the importance of ideological and moral qualities in a person's career development, and even distort their own values in order to protect their favorite artists.

In addition, in view of the asymmetric information behavior between enterprises and celebrity spokespersons, enterprises can, first of all, make constraints in treaties to increase their own discourse power in endorsement contracts. Second, enterprises can cooperate with professional organizations to reduce the degree of information asymmetry to strengthen the background investigation and better supervise the private morality of stars.

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