Analysis of E-Coupon Delivery Strategy Based on Consumer Brand Loyalty of Competitive Enterprise

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Abstract: When the company has the perfect information about customer loyalty, it can make accurate coupon promotions for consumers. Based on the premise consumer brand loyalty information, we establish a coupon placement model of two competing companies to explore the competitive effect of coupon promotion and the reasonable delivery mode of coupons. We have found that the promotion of coupons always lead to increased price competition. However, the competitive effect also affects market share, thereby benefiting companies with increased market share. Consumer brand loyalty represents the level of premium that consumers are willing to pay. Therefore, cultivating consumers' brand loyalty and accurate coupon promotion strategies are of great significance to enterprises.

1. Introduction

At present, mobile Internet has become an indispensable new media in interpersonal communication and information dissemination, and mobile commerce and mobile marketing based on mobile terminals are changing the way people live and serve. Compared with traditional marketing, mobile marketing can more effectively implement the delivery (or push) of more suitable services and products to consumers who need and have high probability of consumption, based on more personalized and more intimate terminal devices. Achieve more precise marketing. Accordingly, some effective marketing tools, such as coupons, have evolved from traditional paper coupons through online coupons to mobile electronic coupons. According to Dickinger et al., in conjunction with the definition of the Mobile Marketing Association, E-Coupon is an electronic form of coupons. Refers to promotional vouchers that are produced, disseminated, and used in a variety of electronic media (including the Internet, MMS, SMS, applets, QR codes, images, etc.), which is fast, efficient, and easy to acquire, store, and redeem [1].

In recent years, with the in-depth development of mobile marketing, E-coupons have also attracted the attention of more and more businesses and scholars. E-coupons are an effective promotion and advertising strategy [2]. Intuitively, the use of coupons as advertising content is more attractive to consumers than pure advertising and direct price reduction, and it is more likely to stimulate consumers' purchasing behavior; using electronic coupons as a promotion strategy can avoid consumption. The imbalance caused by price fluctuations will increase the value of regrets, thus promoting the desire to purchase. Consumers have different preferences for brands and different loyalty to enterprises. For consumers with loyalty heterogeneity, consumers can segment consumer markets and expand market share through coupons. At present, this price discrimination strategy is more common in practical applications, such as the US group taxi and Didi taxi, hungry and the US group take-out will send electronic coupons, the target market and face value of the coupons are different. In the real economy, there are widespread similar behaviors of companies issuing coupons. Therefore, it is necessary to establish a basic model to describe the characteristics of these behaviors and study the behavior of corporate coupon placement strategies.

2. The basic model description

Suppose there are two companies A and B, selling alternative homogeneous products, assuming each manufacturer's unit product cost c, c ≥ 0, each consumer buys up to one unit of merchandise, consumers are willing to be a favorite brand Pay V and V ≥ c, so there is always a market. The heterogeneity of consumers is expressed in each consumer. When choosing two products, the preference for the two products is different, and the price difference from the favorite brand to the unbiased brand is different. We use l to indicate consumption. The brand loyalty, if the consumer's brand loyalty to A is l, if and only if $p_A - p_B > l$, the consumer is willing to change from the original brand A to select brand B. We assume that $l \in [-l_B, l_A]$ obeys a uniform distribution, where $0 \le l_i < V$, where i ∈ {A, B} consumer brand loyalty is 0, indicating no difference to the two brands, neutral attitude [3, 4].

Without loss of generality, we assume that $l_A \ge l_B$,if $l_A = l_B$, then set a standard model similar to horizontal differentiation, where the loyalty parameters play the same role as the transportation costs in other spatial models. If $l_B = 0$, a standard model similar to the vertical difference is set, in which all consumers think that the quality of the brand A is higher than the brand B, and if $l_A > l_B > 0$, the case including the horizontal and vertical differences is set. Suppose the company has the perfect message of the market, knowing the location of all the consumers in the market and understanding their exact loyalty to the brand. In practice, companies can determine the loyalty of each consumer based on their past purchase behavior.

The company issues coupons in two stages, selecting the regular price P_i in the first stage and the promotion strategy in the second stage. When choosing a promotion strategy, each company must determine the target consumer and coupon face value. Assuming that the promotion is targeted, as long as the promotion is made, the coupon is issued, regardless of whether the consumer purchases from the company, the cost z, z ≥ 0, the cost z includes our assumption that the cost for each consumer is given by z ≥ 0 Out (this cost is incurred whether or not the consumer buys from the company). $t_i(l)$ is the indicator variable. If the company is promoting in the consumer of l, the value is 1, otherwise it is zero, and $f_i(l)$ indicates the face value of the coupon.

Depending on the normal price of each company and the face value of the coupon, consumers can maximize their earnings. Therefore, when the consumer at l receives only the coupon from company A, when $p_A - f_A(l) - p_B \le l$, , it will still choose to buy at company A, when only the promotion from company B is received. If and only if $p_A - (p_B - f_B(l)) < l$,, will still choose to buy at Company A.

3. The model analysis

Whether the two companies issue coupons depends on the relationship between p_i and c + z. As shown in the figure, it can be divided into three situations: 1), $p_A \le c + z$ and $p_B \le c + z$,two companies No coupons are issued; 2) $p_A > c + z$ and $p_B \le c + z$, or $p_A \le c + z$ and $p_B > c + z$, only one company issues coupons; 3), when $p_A > c + z$ and $p_B > c + z$, both companies are offering coupons.
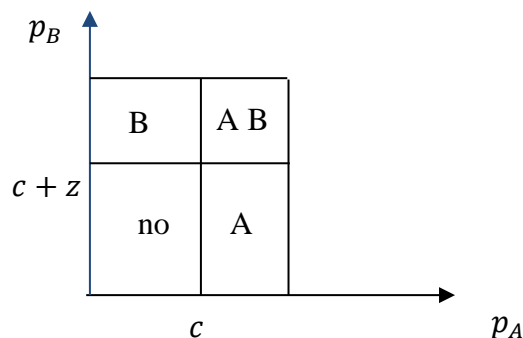

Figure 1.Whether the two companies issue coupons

3.1 Neither company issues coupons

In this case, the cost of the target coupon is high, and both companies are reluctant to place the coupon, $\hat{l} = p_A - p_B$, indicating the position of the marginal consumer.
So the demand function is:

$$D_A^1 = \frac{l_A - \hat{l}}{l_A + l_B}, \quad D_B^1 = \frac{l_B + \hat{l}}{l_A + l_B}$$

The profit function is:

$$\pi_A^1 = \frac{(p_A - c)(l_A - \hat{l})}{l_A + l_B}, \pi_B^1 = \frac{(p_B - c)(l_B + \hat{l})}{l_A + l_B}$$

3.2 Only one company issues coupons

Let us take $p_A > c + z$ and $p_B \leq c + z$ as an example. At this time, the cost of the target coupon of Company B is higher, and it is not willing to put the coupon to be placed. The normal price of Company A is higher, and it is willing to carry out the coupon. $\hat{l} = p_A - p_B$ A company's consumer group $l > \hat{l}$, is not willing to be the target area of the coupon, because this area has higher loyalty to company A, and will not buy coupons at company A. For the area of $l < \hat{l}$, the maximum face value of the coupon issued by Company A is $\overline{f_A} = p_A - c - z$, so the left interval of the target market is $p_A - \overline{f_A} - p_B = \widehat{l_B}$,or,$\widehat{l_B} = c + z - p_B$, for the area of $l < \widehat{l_B}$,because the loyalty of the company to the company B is high, the face value of the company A is limited, so company A does not regard it as the target market[5]. , no coupons are placed. Therefore, the target market for A company to issue coupons is $\tau_A^2 = \{l | \widehat{l_B} \leq l \leq \hat{l}\}$, and the value of issuing coupons for this area is $\overline{f_A}(l) = p_A - p_B - l$.
So the demand function is:

$$D_A^2 = \frac{l_A - \hat{l}}{l_A + l_B} + \frac{\widehat{l_B} + \hat{l}}{l_A + l_B}, D_B^2 = \frac{l_B - \widehat{l_B}}{l_A + l_B}$$

The profit function is:

$$\pi_A^2 = \frac{1}{l_A + l_B}\left((p_A - c)(l_A - \hat{l}) + \int_{l \in \tau_A^2}(p_A - \overline{f_A}(l) - c - z)dl\right)$$

$$\pi_B^2 = \frac{1}{l_A + l_B}(p_B - c)(l_B - \widehat{l_B})$$

3.3 Both companies issue coupons

Let us take $p_A > c + z$ and $p_B > c + z$ as an example. In this case, both companies can make a profit. The target areas of A and B companies coincide, and the target area is $l \in [\widehat{l_B}, \hat{l}]$, as shown.
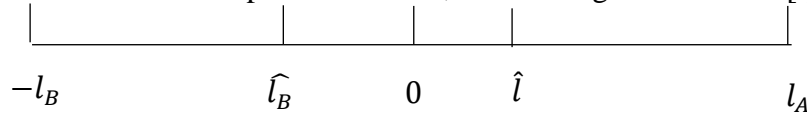

Figure2. The Targeting Zone

The target areas of the two companies are the same, because in the area where company A tries to convert consumers to brands, company B tries to maintain the target customer base and vice versa. In a balanced state, the two companies are in equilibrium, and for the consumer groups outside the target area, because the consumers are loyal enough, the competitor's company cannot attract them.

4. The analysis of equilibrium results

According to the optimal condition of the function solution, the profit function is derived, and the following solution is obtained.

4.1 Neither company issues coupons

$$\widetilde{\pi_A} = \frac{(2l_A+l_B)^2}{9(l_A+l_B)}, \widetilde{\pi_B} = \frac{(l_A+2l_B)^2}{9(l_A+l_B)}; \ \widetilde{Q_A} = \frac{2l_A+l_B}{3(l_A+l_B)}, \widetilde{Q_B} = \frac{l_A+2l_B}{3(l_A+l_B)}$$

$$\widetilde{p_A} = \frac{2l_A+l_B}{3} + c, \widetilde{p_B} = \frac{l_A+2l_B}{3} + c$$

4.2 Only one company issues coupons

$$\widetilde{\pi_A} = \frac{(2l_A+l_B)^2 - z(4l_A+2l_B-5z)}{8(l_A+l_B)}, \widetilde{\pi_B} = \frac{(l_B+z)^2}{4(l_A+l_B)}; \ \widetilde{Q_A} = \frac{2l_A+l_B-z}{2(l_A+l_B)}, \widetilde{Q_B} = \frac{l_B+z}{2(l_A+l_B)}$$

$$\widetilde{p_A} = \frac{2l_A+l_B-z}{2} + c, \widetilde{p_B} = \frac{l_B+z}{2} + c$$

In $\left\{l \middle| l \in [\frac{z-l_B}{2}, l_A - z]\right\}$, the face value of the coupon issuance, $f_A(l) = l_A - z + c - l$, it can be seen that the face value of the coupon gradually decreases with the increase of loyalty, $f_A(l)$The range of change of is $[l_A + c + \frac{l_B-3z}{2}, c]$
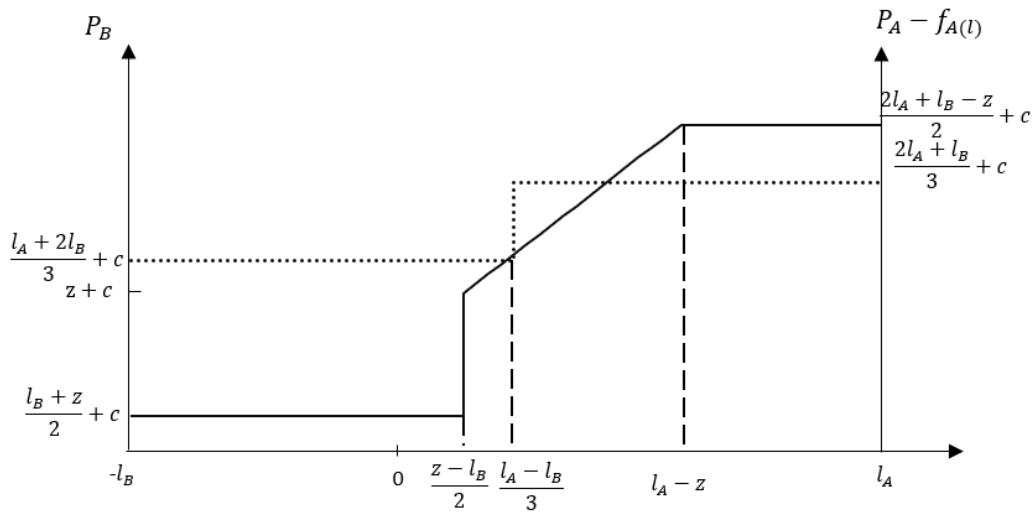

Figure 3. The dotted line indicates that neither company offers a discount, and the solid line indicates that only company A issues coupons.

4.3 Both companies issue coupons

$$\widetilde{\pi_A} = \frac{l_A{}^2+z^2}{2(l_A+l_B)}, \widetilde{\pi_B} = \frac{l_B{}^2+z^2}{2(l_A+l_B)}, \widetilde{Q_A} = \frac{l_A}{l_A+l_B}, \widetilde{Q_B} = \frac{l_B}{l_A+l_B}$$

In $\{l|l \in [-l_B, l_A]\}$, the face value of the coupon issuance, $f_A(l) = l_A - l = f_B(l)$, it can be seen that the face value of the coupon gradually increases with the increase of loyalty. Decrease, $f_A(l)$varies by$[c, l_A + c]$. Similarly, company B's coupon is issued as $f_B(l) = l_B + l$. The figure is shown in the figure.
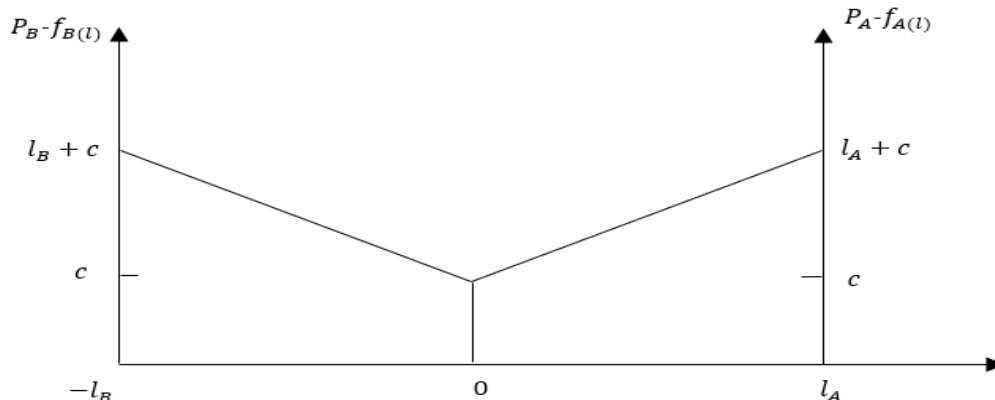

Figure 4. Indicates the balance between the two companies when they issue coupons

5. Conclusion

Mastering the perfect information of consumers is the premise of this article. Consumers' addressability and the company's personalized coupon delivery model have fundamentally changed the company's pricing decisions. Through a simple model, this phenomenon has been studied. Achieving precise impact through coupons allows the company to generate incremental sales flexibly without affecting the regular price, but this approach also tends to exacerbate competition because all consumers, including loyal consumers, have the potential Competitive.

When the company is symmetrical, the previous research results are one-on-one promotions that will cause the players to fall into a dilemma. When companies are asymmetrical, they will have a market share effect. The more companies with more loyal customers, the better they can benefit from this effect. The one-on-one coupon promotion provides the company with the premium it is willing to pay for available customer loyalty. Therefore, the use of accurate coupon promotions is more conducive to large companies and small companies competing for the benefit market. From the results of the analysis, it can be known that cultivating customers' brand loyalty is very important. In the case of information-intensive and more accurate consumer positioning technology, small companies with weak brands are more vulnerable to fierce competition.

Our conclusion is based on a two-stage game where each company promises a normal price. Normal prices impose a cap on the transaction price, and any consumer must pay a certain price. Therefore, it is unwise for a company to pursue the most loyal customers of its competitors. Therefore, excessive competition will harm the company's interests.

Acknowledgments

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