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Analysis of E-commerce Click Farming Problem based on Ordered Logistic Regression

Zhuoxin Zhang, Donglei Li
Business School, University of Shanghai for Science and Technology, Shanghai, 200093, China

Abstract: Click farming is a means for merchants in e-commerce to improve network ranking and obtain sales volume and praise. This paper analyzes the causes of click Farming behavior through the actual situation, and explores the significance of the causes through orderly logistic regression, and puts forward suggestions accordingly.

Keywords: Electronic commerce; Click farming; Ordered logistic regression

1. Introduction

With the development of e-commerce, online shopping has become the main mode of consumption. E-commerce has strong competitiveness due to its convenience of information exchange and commodity liquidity. [1] However, just because of the fierce competition, merchants and merchants, merchants and customers have a layer of special transactions based on credit -- click Farming orders. Click Farming refers to the way that the shop owner pays the customer to improve the ranking and sales volume of the business through false purchase, false praise and other ways, as well as the way to obtain sales volume and praise to cheat the customer, so as to obtain illegitimate benefits. [2] in this paper, the influence of various reasons affecting click Farming behavior was obtained based on orderly Logistic regression by exploring click Farming behavior, combining market credit problems and legal problems.

2. Causes of Click Farming Behavior

2.1. The market credit degree is low, the credit idea is weak

The credit system is not complete. The current Internet trading market does not accurately integrate the information of merchants and customers into the credit system, so it gives e-commerce operators a loophole to hire people to brush the bill.

2.2. Incomplete identity information and incomplete evaluation system

Unsound identity information leads to a "loophole" in the market. Even if the shop owner carries on the false transaction and the propaganda, the store's imperfect rating system creates a zero-cost, risk-free opportunity for scalpers.

2.3. Lack of legal system

In recent years, China has increased restrictions on merchants in the transaction process, but the prevention, governance and supervision of brushing are not enough.

2.4. The illegal gains exceed the illegal costs

Click Farming makes stores attractive in the market. On the one hand, click Farming cost is low, and it can release click Farming tasks in a short time with communication tools. On the other hand, even if they are punished, they are too small to shake up the whole "grey industry".

3. Model Design

3.1. Data sources

The research data of this paper comes from questionnaire survey. The questionnaire contents are as follows:the commonness of click Farming in e-commerce; causes of click Farming behavior.

3.2. Model design

The evaluation of the commonness of click Farming behavior obtained from the questionnaire is a sequence variable. In order to explore the main causes, this paper adopts a more effective ordered Logistic regression model. The model expression is as follows:

$$P(y \le j / x) = \frac{exp(-(\alpha_i + \beta x_i))}{1 + exp(-(\alpha_i + \beta x_i))} \quad (1)$$

Where, y is the evaluation of the commonness of click Farming behavior, j is the assigned grade of y, and x_i is the explanatory variable of impact evaluation. α_i is the intercept parameter; β_i is the regression coefficient. The

evaluation of commonness is divided into four grades, namely "no", "slight", "common" and "many".

Based on the obtained data, 6 reasons in "causes of click Farming behavior" are taken as explanatory variables, and are defined and assigned.

Table 1. Explanatory variables and values of the reasons for click farming behavior

Explanatory variable.	Variable definitions	Mean	Standard Deviation
The market main body credit idea is weak	Yes=1 No=0	0.80	0.402
The illegal gains exceed the illegal costs	Yes=1 No=0	0.78	0.418
The authentication system of identity information is not sound	Yes=1 No=0	0.53	0.500
Store evaluation design is not perfect	Yes=1 No=0	0.59	0.493
Credit is not based on the amount of the transaction	Yes=1 No=0	0.70	0.461
There are fewer brush laws	Yes=1 No=0	0.78	0.418

3.3. Regression result analysis

Firstly, the 6 influencing factors were taken as explanatory variables for multicollinearity analysis, and the results showed that the VIF values of the 6 variables were all less than 10, so the ordered Logistic regression was conducted between them and the explained variables. In the regression results, the significance is 0.000, indicating that the model is significant, and the significance of the parallel line test is 0.193, greater than 0.05, indicating that the orderly Logistic regression can be used to conduct regression analysis on the causes of brushing behavior, and the regression results are shown in table 2.

Table 2. Estimation results of ordinal logistic regression for the reason of click farming

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence interval	
							Lower bound	Upper bound
Threshold	[universality of click farming = 1]	-6.834	0.692	97.489	1	0.000	-8.190	-5.477
	[universality of click farming = 2]	-2.466	0.371	44.071	1	0.000	-3.194	-1.738
	[universality of click farming = 3]	0.283	0.341	0.689	1	0.407	-.386	0.952
Location	[Weak credit=0]	-1.618	0.342	22.363	1	0.000	-2.288	-0.947
	[Weak credit=1]	0a	.	.	0	.	.	.
	[The illegal gains exceed costs =0]	-1.503	0.345	19.011	1	0.000	-2.179	-0.828
	[The illegal gains exceed costs =1]	0a	.	.	0	.	.	.
	[The authentication system of identity information is not sound =0]	-0.999	0.287	12.067	1	0.001	-1.562	-0.435
	[The authentication system of identity information is not sound =1]	0a	.	.	0	.	.	.
	[Store evaluation design is not perfect =0]	-1.566	0.296	28.056	1	0.000	-2.145	-0.986
	[Store evaluation design is not perfect =1]	0a	.	.	0	.	.	.
	[Credit changes are not based on transaction amounts =0]	-0.645	0.287	5.044	1	0.025	-1.207	-0.082
	[Credit changes are not based on transaction amounts =1]	0a	.	.	0	.	.	.
	[Imperfect laws =0]	-0.759	0.318	5.691	1	0.017	-1.382	-0.135
	[Imperfect laws =1]	0a	.	.	0	.	.	.

Table 2 shows that each factor has a negative impact on the commonality of click Farming behaviors. The following points are summarized:

The main influencing factors are weak credit concept of market subjects, illegal earnings exceeding illegal costs, and imperfect evaluation design.

From the perspective that the illegal benefits exceed the illegal costs, the current countermeasures only stop at preventing some people from accepting the click Farming task. Only by intensifying punishment, enriching the information interaction between investigation means and various institutions, and through cooperation, finding out the industrial chain where the merchants are located and increasing punishment can the click Farming be stopped.

The imperfect design of the evaluation system is the biggest loophole that leads to the occurrence of click Farming , so its influence is also significant. If the evaluation system of e-commerce market is complete, the possibility

of intentional praise will be reduced from the system, the authenticity of information of merchants will be guaranteed, and legitimate businesses will be protected.

The identification information authentication system is not sound, and there are few secondary factors influencing the regulation of click Farming .

The authentication of a sound identity system can help to identify the personal information and behaviors on the network to a certain extent. We can determine whether their behaviors are similar to the click Farming behaviors, so as to find out the businesses issuing click Farming tasks and punish and regulate them.

For the legal system to prevent click Farming, there are already some click Farming laws and regulations, but what is missing is the "criminal treatment" and "code of conduct" for these "illegal" merchants, so the system design for click Farming and speculation of credit can be improved [3]. At present, it is important to formulate laws and regulatory measures for click Farming, and regulate the operation of e-commerce market.

Credit change is another influencing factor by the change of transaction data rather than the transaction amount.

The change of merchants' reputation is mainly decided by the quantity of transaction records and the quantity and quality of evaluation, rather than the amount of transaction amount between merchants and customers, which leads to deliberate purchase and deliberate evaluation as the reason to increase the ranking and reputation of merchants. For this non-obvious factor, the method mainly lies in increasing legal education, reducing the possibility of customers being cheated and protecting the legitimate operators in the market.

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