

Analysis of Reputation Speculation Behavior in China's C2C E-Commerce Market

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Abstract—Reputation Speculation behavior means that the buyers and sellers collaborate with each other to make fake transaction and give positive feedbacks in order to raise reputation level of online shops. This paper finds that reputation speculation is widely adopted and becomes an industry in China, making the consumers distrust the reputation of online stores, which is not conducive for the long-term development of E-commerce market. It discusses the four forms of the Reputation Speculation behavior and their characteristics in China's C2C market. It investigates the value and cost of reputation speculation, finds that the fact buyer tends to trade with seller who has higher reputation than others stimulates sellers to increase their feedback score in an abnormal way; reputation speculation does bring higher economic value to online shops than the cost of reputation speculation. Furthermore, free-charge model and lacking of regulation speculation on C2C platform jointly contribute to the emergence of the Reputation Speculation Business in China. Charging each transaction on C2C, establishing the information exchange between platform and logistics, setting up a national-wide E-commerce reputation-worthy system are most effective to curb the development of reputation speculation industry.

Index Terms—C2C E-commerce, Online Reputation, Reputation Speculation, Feedback Score

I. INTRODUCTION

Information asymmetry and unequal relationship between sellers and customers in C2C E-commerce market undermines the trust in E-commerce [1]. In order to facilitate trust in E-commerce market and quantify the

sellers' trustworthiness, thus improve the confidence of both side, the reputation mechanism based on comments from buyers after each transaction was established by eBay first [2] [3]. The C2C e-commerce websites in china have followed the practices of eBay and developed their own online reputation system so far. These systems collect comments (including positive, moderate, negative) from customers on seller's products and services after the completion of each transaction. E-commerce websites calculate sellers' accumulated feedback scores based on the comments¹ and then assess each shop's online reputation by assigning tiered reputation level. Every reputation level has a threshold of reputation score, for example, reaching the class of "one heart" needs 10 feedback scores. As for the sellers, the higher their feedback scores, the higher class of their reputation. The class of reputation each seller obtained is called "reputation rating" according to the C2C platform.

Because of the virtual characteristic peculiar to the C2C electronic commerce website, the seller's reputation level has been an important factor for consumers when making selections [4] [5] [6] [7] [8]. As Good reputation is positively related to online consumer's trust, which results in consumer's favorable attitude toward the shop [9], and increase his willingness to purchase [1]. The higher the reputation level of a seller, the higher both the probability of the seller obtaining a trade and trade price [10] [11]. Hence, to attract more customers, some sellers started to explore the method of raising online reputation, resulting in the emerging of reputation speculation behavior.

As far as in 2000, there has been study on Reputation

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¹ 1 score for each positive feedback, 0 score for moderate feedback, -1 for negative feedback.

Speculation behavior on eBay, which was called Ballot stuffing by some literatures. It means that the buyers collaborate with many sellers to reward illusive positive feedbacks and bloat the seller's reputation, thereby obtaining undeserved transaction opportunity and higher price [12] [13]. There are similar phenomenon in network communities where agents collude together to generate fake feedback in order to obtain more chance of offering service to end-users [14], but most of the limited research focus on C2C market. Subsequently, it was also defined as Reputation hypes, the behavior of giving illusive positive feedbacks jointly in order to improve their reputation rating [15], and profit-driven raters, evaluators driven by profits [16], and market for positive feedback, where some agents openly state they "sell positive feedback" or post fake or symbolic objects for sale at a similarly symbolic price, just to be able to exchange a positive feedback at the minimum cost [17]. All these literatures focus on the influences of Reputation Speculation behavior in C2C market, treat it as the dishonest behaviors of buyers and sellers, and attempt to solve this problem from the perspective of improving the online reputation system and its algorithm [18].

Generally speaking, there is few studies focus on the reputation speculation behavior itself. The only exception is Reference [17] which confirmed the existence of reputation speculation behavior via experiment on eBay and calculated the minimum cost of each reputation speculation, but none of literature investigates the cost of such behavior in China. With the rapid development of E-commerce market, the reputation speculation behavior has evolved from individual behavior to the group behavior and become professionalized gradually in China. As Reference [15] summarized, there were three forms of reputation speculation: low-value transaction and splitting one transaction into multi-transactions to increase transaction number on purpose, fake transactions conducted privately, and corporate driven reputation speculation. The practice of reputation speculation remains evolving into new forms which have not been covered by any other literatures.

Since the purpose of reputation speculation is to increase online reputation level more than the seller could earn by real transaction, it actually twist the seller's online reputation based on which customers may make wrong decisions and thus lose their confidence on C2C E-commerce eventually. Reputation speculation is not conducive to the development of C2C industry, especially when reputation speculation evolves into business behaviors and become an independent profitable industry, which means that the validity and trustworthiness of reputation rating in current E-commerce market is severely dampened. Nevertheless, reputation speculation behavior in other country seems to be not so common and develop into a business yet as in China. However, there are few literatures making comparison between the reputation speculation behaviors between China and other country, exploring the causes of rapid development of such behavior in China. This article tries to investigate the status of reputation speculation business, and the

cause of such phenomenon from the perspective of cost-benefit of feedback score accumulation and the cost structure of the C2C market in China, in order to seek an effective way of curbing reputation speculation.

The remaining part of this article is arranged as following: Section two introduces the definition of reputation speculation and the development of the forms of reputation speculation. The third section explains the causes of reputation speculation behavior in view of the online sellers' profitability and institutional deficiencies of E-commerce market and answers the problem why Reputation Speculation industry is more popular in our country. In the last section, some policy suggestions to curb reputation speculation behavior are discussed.

II. THE STATUS AND FORMS OF REPUTATION SPECULATION IN CHINA'S C2C E-COMMERCE

A. The Definition of Reputation Speculation

According to the definition made by China's leading C2C E-commerce platforms, such as Taobao, Paipai, Baidu and so on, Reputation Speculation means that the buyers and sellers collaborate with each other to give positive feedbacks without actual transactions in order to raise seller's online reputation level.

Comparing real transaction (Fig.1) with the transaction in reputation speculation (Fig.2) reveals that reputation speculation is a manipulated fake transaction, wherein goods are not delivered, and fund flows back into the buyer's account after the buyer paid and make positive comment to seller. Reputation speculation transaction has the following three characteristics:

Fund flow: During the process of reputation speculation, buyer would first pay to seller. After the transaction is completed, however, seller will return the fund to buyer.

Logistics: After buyer make bid and pay through the third-party payment system, such as Alipay system used on Taobao, seller will not pack and ship the goods buyer bid. No goods are delivered to buyer in reputation speculation.

Comment making: In reputation speculation, buyer will surely make positive comments to seller, and seller's feedback increase. But this is not the case for a real transaction in which seller may get a negative feedback.

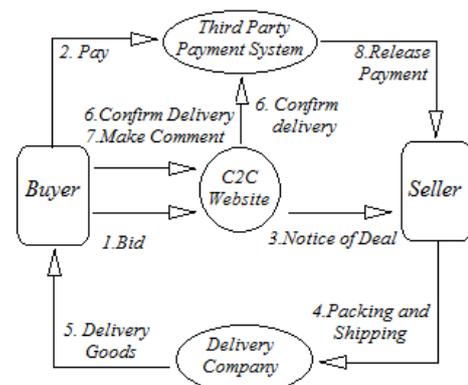


Figure 1. Real C2C transaction

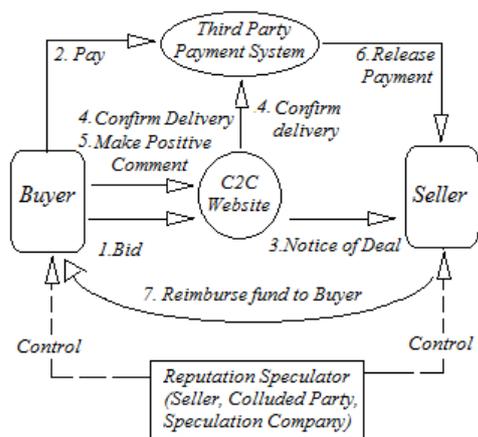


Figure 2. C2C Reputation Speculation Transaction

B. The Reputation Speculation Business in China

There are two types of reputation speculation: the first is conducted by seller itself or anyone who collude with the seller; the second is conducted by a specialized company who provide service to sellers and take charge from increasing the feedback score for sellers. According to the incomplete statistics released by China Business News on July 30th, 2009, there were nearly 500 companies providing reputation speculation services who served around 50,000 or 60,000 sellers. Given that each seller spends 300-500 RMB yuan on the reputation speculation service, the market volume is estimated to be 15-30 million RMB yuan. Netease on July 27th, 2009 reported that, among 20 millions sellers on Taobao, there are over millions of sellers had involved in reputation speculation. Web Housekeeper Trust Platform², one of the speculation companies, claims that it has 11563 “brush to diamond level” members, manipulate fake transactions to increase 119,153 online feedback scores, which engaged 118,860 number of turnover of fund. Meanwhile, Brush Diamond Platform claims that they have served more than two thousands online sellers. All these statistics prove the existence of reputation speculation industry. Currently, the top five reputation speculation companies in China are Web Housekeeper Trust Platform, Sockpuppet, VIP Housekeeper Reputation Platform, Online Business Housekeeper Trust Platform, and Reputation Network respectively. Furthermore, the average and the longest operation period of the top 15 companies are 2.5 years and 4 years respectively.

C. The Forms of Reputation Speculation in China

According to the definition widely used by industry and the analysis of Reference [13], this article summarizes four forms of reputation speculation: Individual Speculation, Teamed Speculation, Community-type Speculation, and Online-shop Custody Speculation.

Individual Speculation means the seller or its colluded party register buyer’s account to make fake transaction with the seller, and give positive feedback. In order to

obtain enough feedback, the seller must have multiple fake transactions between its buyer account and seller account, which is easily detected. This is also why Taobao set a rule that only one feedback score could be calculated per day if more than one transaction between each seller and the same buyer account is taken place in one day.

In Teamed Speculation, a company hires people to register as buyer to make fake transaction with the seller in order to raise the seller’s feedback score, and gets paid by providing such service to seller. Seller will collaborate to make payment confirmation during the fake transaction and reimburse the company after the transaction by his/her own. Speculation companies may face some risk when they transfer fund to seller’s account as payment in the fake transaction, they usually ask the seller to cut down the price in fake transaction, so they could lower the exposure of risk. However, the abnormal price cut would be easily detected as speculation by the platform.

In Community-type Speculation, speculation companies set up an online seller’s community, where each real seller could earn community points by working as buyer to make fake transaction with other seller and give positive feedback to other seller, they are called “Brusher”. Each seller with high community point could post a speculation assignment, and the seller will pay the point to other sellers who accept the assignment and work as Brusher by giving the seller positive feedback in fake transaction, the seller will reimburse the fund paid by Brushers to Brushers after the fake transaction. The speculation company provide fund guarantee services, in which seller’s community points is escrowed to assure that the point will be paid to the Brushers, seller should also deposit enough fund in the company to assure that the fund will be reimbursed to the Brushers. Speculation company make profit from advertising, charging fund guarantee fee, and selling community points to sellers who have no enough points to release an assignment. If the community is large and has enough members, the speculation transaction could avoid repeated fake transaction in Individual Speculation and the fund exposure risk and price cut problem in Teamed Speculation. It works more real in many ways than the other two forms.

Online-shop Custody Speculation is very similar with Teamed Speculation, except that seller could entrust its shop to speculation company, so he/she need not to collaborate with the company to make payment confirmation and fund reimbursement, which will all be taken care of by the company. The company could let its employee or Brusher in Community to fulfill the fake transaction. After the online shop reaches its target reputation level, it will be returned to the seller. There is a more simple forms evolved from Online-shop Custody Speculation recently, some company just register many online shops and sell them after increase its reputation level, so a beginner could buy it and own an online shop with high reputation level immediately. Seller will have to pay the highest speculation fee in this form of speculation.

² <http://www.webgj.com.cn>.

Overall, the forms of reputation speculation evolve gradually with the technique of C2C platform to detect reputation speculation behavior and the increasing demands for reputation speculation from online shops, both the two factors call for speculation forms with higher simulation and efficiency.

Individual Speculation, characterized as low efficiency and easy to be detected, was eventually replaced by Teamed Reputation Speculation, which avoid detection and improve efficiency by taking advantage of the low human resource cost in China and computer IP transition technology. By grouping many real sellers together to speculate with each other, Community-type Reputation Speculation improves the simulation degree of fake transaction and reduce fund risk in Teamed Speculation, thereby gains rapid development. Online-shop Custody Speculation consolidates the characteristics of Teamed Speculation and Community-type Speculation, allow the seller to obtain an online shop with high level of reputation by just pay for it and no need to participate in any repeated fake transactions.

As the latter three forms of speculation are all designed, provided or monitored by reputation speculation companies, we described them as professional reputation speculation. They are now widely adopted and replace the Individual speculation. It also means that with the transition from individual speculation to professional speculation, reputation speculation has developed into an independent industry relying on nearly 20 million online stores on C2C E-commerce platform.

III. THE ANALYSIS OF REPUTATION SPECULATION BEHAVIOR

The information asymmetry and adverse selection in E-commerce market makes accumulating online reputation and getting favorable placement in search results the primary means of competition. According to the current searching rule dominated by reputation rating, the name and price of commodity in E-commerce market, customers tend to trade with sellers who have reached at least a certain level of reputation, the level of online reputation has been a very critical factor for online shops to gain as many click rate and trading opportunities as possible. Therefore, these profit-seeking shops inevitably adopt the method of reputation speculation to increase their online reputation in a short time.

A. The Economic Value of Feedback Scores Accumulation

Data revealed by Taobao, the biggest E-commerce platform in China, states that the annual turnover in 2009 was Renminbi 208.3 billion yuan, while the total number of sellers was Renminbi 8000 thousands, so the daily turnover per capita was about Renminbi 713 yuan. Supposing that the value of each transaction is Renminbi 70 yuan, the number of daily transaction per capita is below 11, which means the average daily scores seller can get is no more than 11 and it takes them several years to reach the crown level .But there are plenty of sellers who only spent one month or half a month reaching the

crown class in the real C2C market, which shows a great difference between the efficiency of feedback scores accumulation through real transaction and that through reputation speculation. Meanwhile, the difference in efficiency exists between individual reputation speculation and company driven speculation as well. Here the efficiency of feedback scores accumulation is defined as the time required to reach a certain class of reputation or the increase of reputation rating in a certain period of time.

It is assumed that: (1) the trading volume the seller can receive through real transaction in unit time is M . (2) each seller could use n accounts to make fake transactions. (3) According to feedback score accumulation rule of E-commerce website, only X times of transaction between a seller and the same account are available for the feedback scores. So the inflated trading volume per unit time the seller can gain is no more than $M+nX$.

Meanwhile, it is reasonable to assume that the positive rate of real transaction is r ($r < 1$), while each feedback collected through fake transaction could be controlled as “positive” which makes the positive rate equal 1. It means that the feedback scores gained through real transactions is smaller than that gained through speculation.

$$rM < rM + n \times X \tag{1}$$

If a seller needs ΔC_0 feedback scores to achieve a certain level of reputation, it will take him $T_1 = \Delta C_0 / rM$ during real transactions, while $T_2 = \Delta C_0 / (rM + nX)$ during speculations. And it's easy to see $T_1 > T_2$, which means the time it takes a seller to achieve a certain class of reputation through reputation speculation is smaller than that through real transaction.

It's concluded that reputation speculation can help sellers achieve ideal online reputation much more quickly. However, whether sellers take reputation speculation or not depends on the economic value of reputation speculation and the expenditures on it.

Seller's reputation speculation selection model is developed below to analyze the economic value of efficiency difference in accumulating feedback score gained through reputation speculation, relative to real transaction. It is assumed that there are two ways for the seller to accumulate reputation and reach the aimed reputation ratings: A is real transaction which takes T_A to get N feedback scores, while B is reputation speculation which takes T_B to get the same scores, so $T_A > T_B$. t_0, t_1, \dots, t_{N-1} represent the time of staying on the feedback score $0, 1, \dots, N-1$ under the method A respectively, $t_0 + t_1 + \dots + t_{N-1} = T_A$. $t'_0, t'_1, \dots, t'_{N-1}$ represent the time of staying on the feedback score $0, 1, \dots, N-1$ under the method B respectively, $t'_0 + t'_1 + \dots + t'_{N-1} = T_B$, so $t'_N = T_A - T_B$. Assuming that y_0, y_1, \dots, y_N represent the average trading volume per unit of time when the seller staying on the feedback score $0, 1, \dots, N$ respectively, and $y_0 < y_1 < \dots < y_N$. The gross income within T_A in method A and method B is Y_A, Y_B respectively:

$$Y_A = \sum_{i=0}^{N-1} t_i y_i \tag{2}$$

$$Y_B = \sum_{i=0}^N t_i' y_i \tag{3}$$

The excess income created by reputation speculation within T_A is:

$$Y_{\Delta} = Y_B - Y_A \tag{4}$$

Add (2) and (3) into (4), and as $t_N' = T_A - T_B$, we have:

$$Y_{\Delta} = \sum_{i=0}^{N-1} (t_i - t_i')(y_N - y_i) \tag{5}$$

Obviously, $Y_{\Delta} > 0$, it means that speculation can improve reputation level of online shops quickly, which leads to more trading volume as soon as possible. But whether a seller chooses reputation speculation finally depends on whether Y_{Δ} is larger than C , the expenditure paid to reputation speculating company.

B. The Market Value of Reputation Speculation: Estimated From the Data in C2C Market

In this part, we use the data collected from Taobao and a speculating company Xishuashua to estimate the excess profit earned through reputation speculation.

First, we take women shops, the quantity and turnover of which are largest in Taobao, as an example. We extract 120 sellers, 20 sellers from five different reputation ratings: one diamond, two diamond, three diamond, four diamond, five diamond and one crown respectively based on systematic sampling, and then collect each seller's total operating time T_j and monthly trading volume V_j to calculate the average total operating time t_j and daily trading volume V_j for each reputation level j , j values from 1 to 6.

So the sellers' average time staying in specific reputation level j is $t_j = T_{j+1} - T_j$, it also means the time it takes for a seller to improve their level from j to $j+1$. While the daily trading volume for sellers who stay in specific level of reputation is $y_j = V_j/30$ (as Table I).

The total time it takes for a seller to improve his reputation ratings from one diamond to one crown without speculating is $T_A = 405.65$ days (904.85-499.2=405.65). So a Seller's income obtained by method A within $T_A = 405.65$ days during the process of improving a seller's reputation rating from one diamond to one crown can be estimated. For the convenience of calculation, we assume that sellers gain one yuan from each transaction, so $Y_A = 3321.4707$.

In order to find t_j' , we collect data in Xishuashua³, the reputation speculation company promises that it takes 7, 16, 20, 40 and 40 days to improve the reputation ratings from one diamond to two diamond, two diamond to three diamond, three diamond to four diamond, four diamond to five diamond and five diamond to one crown respectively. Hence, Seller's income obtained by method B within $T_A = 405.65$ days is $Y_B = 10349.2$.

The excess value created by reputation speculation within T_A (405.65 days) is $Y_{\Delta} = Y_B - Y_A = 7027.7293$.

TABLE I.
THE OPERATING TIME AND TRADING VOLUME OF SELLERS

Class	T_j	t_j	V_j	y_j
One crown	904.85	-	823.4	27.5
Five diamond	846.6	58.25	662.75	22.1
Four diamond	774.85	71.75	290.2	9.7
Three diamond	617.2	157.65	170.3	5.7
Two diamond	567	50.2	140.85	4.7
One diamond	499.2	67.8	92.9	3.1

Data source: random sampling from www.taobao.com.

C. The Cost Analysis of Reputation Speculation

As above mentioned, if the value of reputation speculation is smaller than the cost of it, no reputation speculation would be undertaken. According to the quote issued by "Taobao Reputation Expert", a speculating company, the price for raising from reputation level j to $j+1$ in t_j' days is P_j as shown in Table II. So, the average price of upgrading reputation rating from one diamond to one crown is 6502 yuan ($P_1 + \dots + P_5$), smaller than the excess income (7027.7293 yuan) created by speculation as shown in 3.2. It shows that online shops can create value through reputation speculation, relative to the expenditure.

According to Taobao, each seller should collect M_j feedback score to raise from j to $j+1$, so the speculation price of one feedback score is $p_j = P_j/M_j$. If a seller wants to jump from one diamond to one crown, he must pay 6503 yuan to gain 9750 feedback scores, it means that each seller should pay 0.67 yuan to obtain one feedback score on average during speculation.

TABLE II
THE PRICE LIST OF REPUTATION SPECULATION

Speculation	t_j'	P_j	M_j	p_j
5 diamond - 1 crown	10	3000	5000	0.60
4 diamond - 5 diamond	10	2120	3000	0.71
3 diamond - 4 diamond	10	682	1000	0.68
2 diamond - 3 diamond	7	418	500	0.84
1 diamond - 2 diamond	8	282	250	1.13
1 diamond - 1 crown	45	6502	9750	0.67

Data Sources: <http://www.taobaowin.com>

The sellers taking speculation behavior should not only pay speculation agency fee, but also pay the transaction fees for virtual transactions, which generally contains two parts: Fee levied by the platform and that charged by the third-payment company. Nevertheless, free model has been a very important strategy for E-commerce platform and the third payment to gain market share and keep user viscous in China, under the influence of China's distinctive spending and paying habits. This is exemplified by the case of Taobao and Alipay which was the first to introduce the free model and thereby dominated China's E-commerce market afterwards. So, sellers don't need to pay any fee to the platform according to trading rules of Taobao and other websites, unless they need extra services such as paid consumer protection scheme or favorable advertise position. Most of the third payment in China are attached to C2C

³ <http://www.xishuashua.net>.

E-commerce website and adopt free model too.

Comparing the system of Taobao and that of eBay, it is recognized that though very similar to each other in systems and terms of reputation rating, they are quite different in market microstructure, especially the fee structure. Sellers should pay Insertion fees when they list an item on eBay and Final Value fee if the item sells. The Final Value fee is charged according to the value of transaction, for example for most items, 6-15% for the initial \$50 closing value, 3.75%-9% for the initial \$50.01-\$1000, 1-2% for the remaining closing value balance. Nevertheless, the Final Value fee varies according to different commodity type, the rate is the lowest for computer network, but highest for books, DVDs, movies and games (Table III). As a way of recognizing and rewarding sellers who consistently provide excellent customer service on eBay, PowerSellers can get 5%, 15%, 20% of Final Value Fees discounts when their detailed seller ratings (DSRs) for the last 30 days reach 4.6, 4.8 and 4.9 respectively. So the overall average fee level is estimated as 3%-10% of commodity price.

TABLE III
FEE STRUCTURE ON EBAY AND PAYPAL

	Electronics photos	Computer networks	Clothes, shoes	Books, music, movie, games
Insertion fee	\$0.35	\$0.35	\$0.35	\$0.15
Full Value fee of each transaction				
\$0 - \$50	8.00%	6.00%	12%	15%
\$50.01 - \$1,000	4.50%	3.75%	9%	5%
Over \$1,000	1%	1%	2%	2%
PayPal fee based on monthly sales				
\$0 - \$3,000.00	2.9% of the value of each transaction+ \$0.30			
\$3,000.01 - \$10,000.00	2.5% of the value of each transaction+ \$0.30			
\$10,000.01- \$100,000.00	2.2% of the value of each transaction+ \$0.30			
> \$100,000	1.9% of the value of each transaction+ \$0.30			

Data Sources: www.ebay.com

This means that the costs of reputation speculation in the two C2C E-commerce markets are totally different. Assuming that a seller launches a speculation deal of cloth valued 30 dollars, he must pay 4.82 dollars (0.35 dollars for the insertion fee, 3.6 dollars for service charge, and the minimum 0.87 dollars for PayPal) for this virtual transaction on eBay, while he pays nothing to Taobao and E-Bay. It has been proved in 3.2 that only when the economic value of speculation Y_{Δ} is larger than the speculation cost C , will the sellers take this behavior to improve their reputation ratings. If the seller need to pay an extra cost C' ($C' = \sum_{i=1}^m C_i$, where C_i represents the transaction cost of each transaction, m represents the

number of virtual transaction in reputation speculation) to website and third-party payment company, when C' is large enough to make $Y_{\Delta} < C + C'$, the seller will give up reputation speculation. For example, the above analysis indicates that if the seller wants to jump from one diamond to one crown, he must pay 6502 yuan of agency cost to gain 9750 feedback scores. So sellers should pay 0.67 yuan for one virtual transaction score on average. As seller can obtain 0.72 yuan extra income from one feedback score (is equal to 7027/9750), when the fee charged by website is 0.05 yuan for each transaction, the seller would not get any extra income. Hence there is no difference between raising to a higher level of reputation by real transaction or speculation, which will inevitably to reduce demand for reputation speculation (as Figure 3 shows, Y_A is the actual transaction income, Y_B is total income obtained after reputation speculation, so $Y_B - Y_A$ indicate the excess income of speculation without any agency cost and platform cost. If agency cost for speculation is C , then the marginal platform cost M which makes the net speculation income zero would be $Y_B - C - Y_A$). It indicates that whether the reputation speculating cooperation can evolve into an industry lies in the level of transaction cost for the speculation against income. The huge market scale in China makes that more transaction opportunity and higher income could be obtained by reputation speculation than in other countries, while the free model of C2C market in China makes the cost of reputation speculation very low. The specific cost-benefit structure could explain the severity of reputation speculation in China.

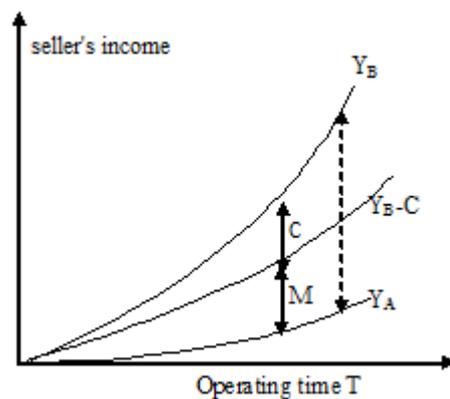


Figure 3. The effect of transaction cost on reputation speculation

IV. CONCLUSIONS

This article discusses the four forms of the Reputation Speculation behavior and their characteristics in China's C2C market by identifies the difference between real transaction and reputation speculation, then reveals the driving forces of the emergence and development of C2C reputation speculation industry from the perspectives of sellers' pursuit of maximum profit, cost structure and the trading system of C2C platform, etc. The following conclusions have been made:

- (1) Online reputation speculation is that sellers

accumulate their feedback scores by conduct unreal transaction in order to reach a target reputation level in a shorter time than they could do by real transaction. Online reputation speculation is widely spread in China's C2C market. There emerged four forms of online reputation speculation in China: Individual speculation, team speculation, community speculation and online-shop custody speculation. The online reputation speculation industry has evolved from an individual scattered behavior to a commercial and professional phenomenon gradually and become an independent industry in E-commerce market.

(2) The reason of online reputation speculation is that buyers tend to select sellers according to their reputation level in C2C transactions, as a result of information asymmetry in C2C E-commerce market. Only reaching considerable reputation ratings can sellers have access to plenty of trading volume, but the current reputation mechanism applies the rule that sellers' feedback scores are accumulated with the increase of transactions. So it would take more time for start-up sellers with few history transactions to obtain a certain amount of feedback scores than for sellers who already have enough score, start-up sellers are trapped in a loop of "low level-low transaction-low level". Reputation speculation becomes an ideal choice for sellers who are in low level of reputation and hope to gain enough feedback scores within a short time.

(3) There are two institutional conditions of reputation speculation: Firstly, C2C website has not imposed rigid restrictions on reputation speculation. This is the fact in China, as platform interests lies in the amount of online shops and trading volume. Hence, using unconventional means to increase trading volume would bring increased activity to website and attract more buyers into the C2C market, as long as inflated reputation does not affect customers' confidence on E-commerce market in the short term. However, there is no rule to guarantee that sellers act honestly in real transactions while committing reputation speculation, the speculations would make consumers lose confidence on sellers' trustworthiness eventually. Secondly, website could not monitor the logistics process to judge the reality of each transaction, as each seller usually chooses its own logistics in C2C market.

(4) The economic motivation of reputation speculation is the high-yield and low-cost relation in E-commerce transaction. High reputation level allow sellers get access to more trading volume and higher profits, while seller can gain high reputation level quickly through reputation speculation without any charges imposed by C2C platform and third-party payment system. This is the main reason that reputation speculation is more popular in China than in other countries.

Based on the above conclusions, several suggestions are proposed to tackle reputation speculation behavior.

Firstly, the most effective method to curb reputation speculation is to increase its cost. In order to balance with the free-charge policy in C2C E-commerce market, website could adopt a tiered fee structure to different

sellers according to their reputation level. Free charge for those who have met a certain reputation threshold (positive feedback ratio instead of accumulated score should be as a benchmark), higher charges for the dishonest. For example, eBay has adopted a preferential policy for sellers who get 100% positive rate. This measurement can not only facilitate trust, but also rationalize the cost-profit ratio in E-commerce market, thereby reducing the sellers' motivation of reputation speculation, which is consistent with previous research results of Reference [19], [17] and [20].

Secondly, C2C platform could schedule periodical reputation maintenance activities to check the behavior of online shops [14]. When a shop is implementing reputation speculation, its transaction volume will show a sudden rise, then falls after it reputation level reach at a certain level and quit speculation. Once a shop is identified to having implemented the speculation behavior, C2C platform could adjust its reputation level according to certain preset criteria. This kind of reputation maintenance would help to maintain the reliability of the reputation system.

Thirdly, policy to ban reputation speculation, such as closing the speculation companies and their websites and prohibiting the related publicity, should be announced. If punishment is bigger than profits, it would minimize the probability of cheating [21].

Fourthly, a united E-commerce reputation-worthy system should be established. The current personal reputation-worthy system in China only records personal creditworthy information kept in banking system. If the reputation-worthy system is expanded to the booming E-commerce market so as to exhibit sellers' creditworthy from various perspectives other than just financial aspect, sellers will act more honestly to defend their own reputation.

Fifthly, the current reputation system in C2C market seems to send a message that new sellers are dishonest. In order to resolve the trap of "low level-low transaction-low level", the current rating rule which is based on sellers' accumulated feedback scores in E-commerce rating system should be altered, such as offering an average basic reputation level to new entrants, or using creditworthy information in bank system to assess new sellers' reputation ratings. Thereby, sellers' motivation of reputation speculation is reduced.

Last but not least, E-commerce platforms should strengthen information sharing with logistics companies by connecting with the system of logistics companies and monitoring the process of goods delivery of every deal so that they can detect fictitious trades rapidly and accurately, and stamping out reputation speculation ultimately.

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REFERENCE

- [1] Sirkka L. Jarvenpaa, Noam Tractinsky and Michael Vitale, "Consumer Trust in an Internet Store," *Information Technology and Management*, vol.1, No.1, pp. 45-71, 2000.
- [2] Chrysanthos Dellarocas, "The Digitization of Word-of-Mouth: Promise and Challenges of On-line Reputation Mechanisms," *Management Science*, vol. 49, No.10, pp. 1407-1424, 2003.
- [3] Paul Resnick and Richard Zeckhauser. "Trust among Strangers in Internet Transactions: Empirical Analysis of eBay's Reputation System," in M. R. Baye (Ed.), *The Economics of the Internet and Ecommerce*, Volume 11 of Advances in Applied Microeconomics. Amsterdam: Elsevier Science, pp. 127-157, 2002.
- [4] Paul Resnick, Ko Kuwabara, Richard Zeckhauser, Eric Friedman, "Reputation Systems: Facilitating Trust in Internet Interactions," *Communications of the ACM*, vol. 43, No.12, pp.45-48, 2000.
- [5] Gail L. Rein, "A Reference Model for Designing Effective reputation Information Systems," *J. Inf. Sci.*, Vol. 31, No. 5, pp. 365-380, 2005.
- [6] Mary A. Eastlick and Richard Feinberg, "Shopping Motives for Mail Catalog Shopping," *Journal of Business Research*, vol. 45, No.3, pp.281-290, 1999.
- [7] Peter Kollock, "The Production of Trust in Online Markets," In: *Advances in Group Processes*, vol. 16, pp. 99-123, 1999.
- [8] J. Hawes and James R. Lumpkin, "Perceived Risk and the Selection of a Retail Patronage Mode," *Journal of the Academy of Marketing Sciences*, vol.14, No.4, pp.37-42, 1986.
- [9] Dong Cheng, Jidong Han and Yuanfang Song, "Is Value Sufficient? Empirical Research on the Impact of Value and Trust on Intention," *Journal of Software*, vol.6, No.1, pp.124-131, 2011.
- [10] Paul Resnick, Richard Zeckhauser, John Swanson, Kate Lockwood, "The value of reputation on eBay: A controlled experiment," *Experimental Economics*, vol. 9, No.2, pp.79-101, 2006.
- [11] Stephen S. Standifird, "Reputation and E-commerce: eBay auctions and the Asymmetrical Impact of Positive and Negative Ratings," *Journal of Management*, vol. 27, pp. 279-295, 2001.
- [12] Dellarocas, Chrysanthos. "Immunizing Online Reputation Reporting Systems against Unfair Ratings and Discriminatory Behavior," In *Proceedings of the 2nd ACM Conference on Electronic Commerce*. Minneapolis, MN, pp. 17-20, 2000.
- [13] Audun Josang, Roslan Ismail and Colin Boyd, "A Survey of Trust and Reputation Systems for Online Service Provision," *Decision Support Systems*, vol. 43, No.2, pp. 618-644, 2007.
- [14] Mohamed Amine M'hamdi and Jamal Bentahar, "Scheduling Reputation Maintenance in Agent-based Communities Using Game Theory," *Journal of Software*, vol. 7, No. 7, pp.1514-1523, 2012.
- [15] Hui Peng and Xiao-bin Feng, "The Analysis on Reputation Hypes in C-C E-commerce Market in China," *Proceedings of 2009 the 2nd IEEE International Conference on Computer Science and Information Technology*, pp. 314-318, 2009.
- [16] Yuhong Liu, Yafei Yang and Yan Sun, "Detection of Collusion Behaviors in Online Reputation Systems," In: *Proceeding of Asilomar Conference on Signals, Systems & Computers*. Pacific Grove, CA, pp.1368-1372, 2008.
- [17] Federico Dini and Giancarlo Spagnolo, "Buying reputation on eBay: Do recent changes help?" *International Journal of Electronic Business*, vol.7, No.6, pp.581-598, 2009.
- [18] Chunhui Piao, Jing An and Meiqi Fang, "Studies on the Reputation Feedback Model and its Calculation Method in C2C E-commerce Website," *Information Magazine*, vol.26, No.8, pp.105-107, 2007.
- [19] Eric Friedman and Paul Resnick, "The Social Cost of Cheap Pseudonyms," *Journal of Economics and Management Strategy*, vol. 10, No.2, pp.173-199, 2001.
- [20] Rajat Bhattacharjee and Ashish Goel, "Avoiding Ballot Stuffing in eBay-like Reputation Systems," *Proceedings of the 2005 ACM SIGCOMM workshop on Economics of peer-to-peer systems*. New York, NY: ACM, pp.133-137, 2005.
- [21] Cheng Zhang, Qing-sheng Zhu and Zi-yu Chen, "Credit-based Repeated Game Model Applied in Transfer Decision of Opportunistic Network," *Journal of Software*, vol.6, No.9, pp.1649-1654, 2011.

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