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Fan-Chen Tseng

C.-F. Zeng

Y.-S. Chen

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Understanding Multiple Adoption in C2C Platforms in China

F.-C. Tseng¹, C.-F. Zeng², Y.-S. Chen³

1. Kainan University

2. Shanghai University of Finance & Economics

3. Louisiana State University

tfckn01@mail.knu.edu.tw, miszqf@126.com, qmchen@lsu.edu

Abstract: The network effect is the general principle that the value of connecting to a network depends on the number of existing customers in the network. Usually, the network effect makes strong firms stronger and weak firms weaker. In e-commerce, however, the power of network effects can be mitigated when users adopt multiple transaction platforms (i.e., *multiple adoption*). Owing to multiple adoption, emerging firms have a chance to compete with or surpass strong incumbents. This empirical study showed that, because of multiple adoption, smaller players can still exist in the face of a dominant player in China's competitive online auction platforms.

Keywords: Network effect, e-commerce, multiple adoption, online auction.

1. Introduction

In network economics, *network effect* refers to the general principle that the value in connecting to a network increases with the number of users already in the network. The networks can be physical, such as telephone networks, or virtual, such as the networks of the members of a Web site or the networks of the users of a computer system. Because of network effect, larger networks are more valuable to users than smaller ones. Users thus tend to prefer larger networks to smaller ones, which makes larger networks even larger. This self-reinforcement nature makes the strong firms stronger and the weak firms weaker. To an

extreme, a market characterized by network effects is usually expected to be taken by a monopoly [7] [10] [12]. Network effect has been influential in the competition between technological standards in network industries, such as information, telecommunication and consumer electronics industries [20]. Well-known examples include the war between *Wintel* and Apple computers (*Wintel* is a dominant market leader and Apple is a niche player), the war of VHS and Beta video recorders (VHS succeeded and Beta failed), and recently the war between blue-ray DVD and HD DVD (blue-ray DVD is now dominating).

The impact of network effect still carries over to electronic commerce [16]. In electronic commerce, the first-mover advantage chiefly comes from network effect, and this is especially true for the *in-fo-mediary* business such as online auctions and online recruiting services. With more buyers and sellers (or employers and applicants), the website offers more chances of successful transactions (or employments). Thus the value of participating in a larger auction (recruitment) website is higher, and users tend to prefer larger sites to smaller ones, which makes larger sites even larger. Empirical evidences include the competitions between eBay and Yahoo!Auction in North America (where eBay is the winner) and in Japan (where Yahoo!Auction beats eBay).

Nevertheless, a fundamental difference exists between e-commerce and other network industries: multiple adoption of products or services. In informa-

tion or telecommunication industries, the cost can be prohibitively high for general consumers to buy one Apple computer *and* one Intel computer, or subscribe *simultaneously* to two or more cell phone services. Therefore, users are forced to take *exclusive adoption* by participating in just one network. In e-commerce, however, the cost can be sufficiently low to allow users to adopt two or more networks. For general users, the cost is merely applying for an account in multiple websites. We term this phenomenon as *multiple adoption*.

In e-commerce, therefore, the winner may not always take all the market and challengers can still have a chance to survive and grow. For example, **Yahoo!Kimo Auction** is the leading auction site in Taiwan, but the new entrant **ruten.com** competes with **Yahoo!Kimo Auction** and survives [17]. In addition, most users of **ruten.com** are multiple adopters who adopt both **Yahoo!Kimo Auction** and **ruten.com** simultaneously [18]. Since C2C platforms are one of the major online purchasing channels [19] and the size of C2C electronic market in China is much larger than that in Taiwan, it is interesting to examine whether and how multiple adoption occurred in China.

In this study, we examine the market situation of C2C auction sites in China, and explore the following questions:

- (1) Whether multiple adoption occurs (i.e., users adopt multiple auction sites simultaneously)?
- (2) Why and why not users adopt multiple auction sites?
- (3) Is multiple adoption an intermediate phase to exclusive adoption?

2. Literature Review

There is a rich literature on network effects. For example, Katz and Shapiro [7] proposed the term positive consumption externality and defined it as the

utility a user derives from consumption increases with the number of other users consuming the good. Later on, Choi et al. [2] argued that network externality is no longer an externality if a market price already reflects the price of an external benefit or loss, and proposed that the term network effects can better describe the targeted phenomenon than network externality. This study adopts this suggestion and uses network effects to describe the phenomenon.

Recent works on network effects examined numerous topics, including product launch strategies [11], pricing strategies [5], innovation and strategic activities [4] [5], the customer-capturing strategy for replacing leading technologies [13], and compatibility strategies [20]. Some researchers extended the theory of network effects to two-sided markets such as auctions and recruiting services [1] [8] [9].

Unfortunately, previous works were mostly based on the simple assumption that consumers adopt one network at a time. In reality, however, users may adopt more than one network simultaneously. We termed this phenomenon as multiple adoption [14] [15]. Some other researchers introduced similar terms such as multihoming [3] to describe this situation, and discussed various strategies in the context of multiple adoption. However, these works are mostly theoretical models in economics rather than extensive empirical studies. The purposes of this paper are therefore: (1) providing empirical evidence for multiple adoption to enhance the theoretical research models, and (2) providing information and suggestions for challengers to take advantage of multiple adoption for survival and growth.

3. Background and Methodology

Established in 1999, Eachnet was China's earliest and largest C2C auction site. In 2002, eBay partnered with Eachnet to establish eBayEachnet, but soon faced tough competition from China's local start-up Taobao,

which was set up in 2003. In 2006, Taobao surpassed eBayEachnet and become China's largest C2C platform. In 2009, eBayEachnet exited from China's C2C market and transformed into a service company for the purchase of overseas products. Currently, **Taobao** is the largest C2C auction site in China, followed by **PaiPai**, which was established in 2006.

The questionnaire was designed to understand how users adopt the two major auction sites in China — Taobao and PaiPai, with special emphasis on whether and how users have multiple adoption. Because auction is a two-sided market connecting buyers and sellers, the questionnaire deliberately identified three types of users: pure buyers, pure sellers, and mixed users (i.e., *buyer and sellers*). The questionnaire was proofread by 5 graduate students who were savvy users of online auction websites, and a pretest was then conducted for further correction and modification. After this, the printed questionnaire was disseminated in five classes, one is MBA students and the others are undergraduate students, all of them are students at a university in China. A total of 170 valid responses were collected.

4. Data Analysis

We distinguish and categorize users by two dimensions: activities in auctions websites and memberships in auction websites.

According to chief activities, there are three kinds of users: (1) pure buyers: buying goods without selling goods; (2) pure sellers: selling goods without buying goods; (3) mixed users: buying goods and selling goods. For ease of discussion, pure buyers and pure sellers are collectively termed as *pure users*.

According to membership, there are two kinds of users: (1) exclusive adopters: using either **Taobao** or **PaiPai**, but not both; (2) multiple adopters: using both **Taobao** and **PaiPai**.

4.1 Sample Profile

Table 1 shows the sample profile. Of the 170 samples, 116 (68.2%) are female and 54 (32.8%) are male. Their ages are mostly between 21 and 30 (66.5%) or under (including) 20 (32.3%). Almost all of them (169 out of 170) have collegiate degrees or higher. Most of them (162 or 95.3%) are students. Most of them (130 or 76.5%) have experience in online auctions for one year or more. There are 163 (95.9%) pure buyers, 5 (2.9%) mixed users, one (0.6%) pure seller, and one bystander (browsing only).

4.2 Adoption of Auction Websites

Of the 170 samples, 158 (92.9%) adopted Taobao exclusively, 1 (0.6%) adopted PaiPai exclusively, and 11 (6.5%) adopted both websites. Moreover, all 11 multiple adopters are pure buyers, and all joined Taobao first and then PaiPai, which means that PaiPai is starting to erode the business of Taobao. However, this also means that most customers of PaiPai are not new (distinct) consumers. Rather, they are *multiple adopters* coming from the rival auction website Taobao. This implies that for new entrant firms such as PaiPai, attracting multiple adopters may be an important marketing strategy.

4.3 Why and Why Not Multiple Adoption

As shown in Table 2, the three main reasons for multiple adoption, in order, are: (1) looking for more transactions, (2) seeking special goods, and (3) searching for more information about products and prices.

Note the order of the reasons reverses the finding in Taiwan [18]. This may reflect that buyers in China's are more active or aggressive in purchasing than Taiwan's buyers, supporting the fact that C2C market in China is growing drastically and more competitive.

As shown in Table 3, for the 158 exclusive adopters using only Taobao, the chief reasons for *not* adopting multiple auction sites are: (1) having been used to the interface of Taobao (39.9%), (2) there are more members in Taobao (30%), and (3) they have

established trading partners (14.6%). Note that the first and the third reasons are the *lock-in effect* [10] and the second reason is a case of the *network effect*. Clearly, Taobao has obtained first-mover advantage relative to PaiPai.

Table 1. Summary of Descriptive Statistics of Study Participants

		Count	%
Gender	Male	54	32.8
	Female	116	68.2
Age	≤ 20 (years)	55	32.3
	$21 \leq \text{age} < 30$	113	66.5
	≥ 30	2	1.2
Job	Student	162	95.3
	Teacher	4	2.4
	Others	4	2.4
Online auction experience	< 1 year	40	23.5
	≥ 1 yr and < 3 yrs	96	56.5
	≥ 3 yrs	34	20.0
Chief activities	Pure buyer	163	95.9
	Pure seller	1	0.6
	Buyer and seller	5	2.9
	Others	1	0.6

Table 2. Reasons for Multiple Adoption

<i>Reason</i>	<i>Frequency</i>	<i>%</i>
looking for more transactions	5	45.5%
seeking special goods	3	27.3%
searching for more information about products and prices	2	18.2%
others	1	9.1%

Table 3. Reasons for *Not* Multiple Adoption

<i>Reason</i>	<i>Frequency</i>	<i>%</i>
having been used to the interface of Taobao	63	39.9%
more members in Taobao	59	37.3%
with established trading partners	23	14.6%
others	13	8.2%

4.4 Multiple Adoption as a Transition Phase to Exclusive Adoption

For the 158 exclusive users of Taobao, we further investigated whether they ever used eBayEach-

Net, and if yes, how they become exclusive users of Taobao. Of the 158 users, 14 of them ever used eBayEachNet. Five of these 14 users adopted eBayEachNet initially, then adopted both BayEachNet and Taobao (i.e., multiple adoption), and finally only Taobao. Four of these 14 users adopted Taobao initially, then both BayEachNet and Taobao (i.e., multiple adoption), and finally only Taobao. Five of these 14 users adopted eBayEachNet initially, and then directly switched to Taobao exclusively. From this fact, we see that multiple adoption can serve as a transition phase to exclusive adoption.

5. Discussion

From the above analysis, we have the following observations:

1. Network effects can result in first-mover advantage for incumbents. Therefore, the get-big-fast strategy must be pursued to build a larger customer base. Meanwhile, consumers' multiple adoption of online services still gives starting firms a chance to survive and even surpass incumbent firms.

2. Consumers are variety seekers, ready to have novel experiences, and eager for more information to reduce uncertainties and ensure fairness in trade. A single dominant player in online business is not fully favorable to consumers, and consumers are welcoming new firms to enter the market.

3. New entrant firms can attract customers if they can provide valuable information, special goods, and facilitate transaction processes.

4. The revenue of online auction websites comes from several sources, such as selling advertisements, transaction fees, product registration fees, and membership fees. For stronger firms, charging fees for membership or transaction may be acceptable to most customers, although this may lose some business to competitors. For startup firms, the revenue should chiefly come from selling advertisements, and there-

fore, they must find ways to attract a significant number of web users to visit their sites to gain more bargaining power with advertisers.

5. It is important to note that although users can gain benefits (such as gathering more information, finding more items, achieving more transactions) from multiple adoption, they have to pay costs (such as time cost, energy cost, and/or money) for multiple adoption. New entrant firms, therefore, should not only find ways to provide more benefits to multiple adopters but also reduce their costs of multiple adoption so that multiple adopters will gain net profit in multiple adoption.

6. To reduce uncertainly and risks, users may not wish to abandon original supplier all at once to switch to a new supplier. Rather, users may adopt both original supplier and new supplier for some time, where multiple adoption occurs. Therefore, new suppliers may facilitate or encourage multiple adoption for users as a less risky transition phase toward exclusively adopting new suppliers.

6. Conclusion

In this paper, we conducted an empirical study on the behavior of online auction users to understand how network effects and multiple adoption interact to influence the competition between the two major auction websites in China. We also examined whether multiple adoption could be a transition phase to exclusive adoption.

We found that a larger customer base can result in stronger network effects and gives the incumbent the competitive advantage, but users still adopt multiple auction websites, giving smaller firms a chance to thrive.

Here are suggestions for both the incumbent and starting firms in electronic commerce:

- (1) The incumbent firm (market leader) should seek ways that add more value to the current con-

sumers to increase the lock-in effect on them. As more customers are retained, the network effects will be stronger and the incumbent will enjoy more competitive advantage.

(2) The starting firm, on the other hand, should seek ways that encourage consumers to take multiple adoption to attract customers from the market leader.

In addition, multiple adoption may also occur in other online platforms such as job websites and online gaming [21]. For example, an employer (or job seeker) may adopt more than one job website to post job openings (or to find jobs). The findings in this paper may also offer some insights in these online industries.

For other technology-based services, multiple adoption may serve as a transition phase from existing technologies to new technologies. That is, before completely replacing existing technologies, new technological facilities may co-exist with existing technological facilities to reduce the anxieties or risks in using new technologies. For example, when introducing the emerging NFC (near field communication) services such as contactless smart cards or contactless payment, service providers should allow users to use either NFC-enabled smart phones or traditional cards. This would make the transition from existing technologies to new technologies smoother.

Overall, this empirical study made a confirmation to the theoretical frameworks of Teng et al. [14] and Doganoglu and Wright [3] on multiple adoption. Future theoretical research can be conducted to refine and extend theoretical models based on the evidence provided by this paper, and future empirical research can be conducted to find more detailed profiles of multiple adopters.

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