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Which Location to Register For Sellers in C2C E-Market in China?

A Study on Taobao.Com

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Abstract: As there are a large number of sellers and products on C2C shopping websites, consumers are faced with the problem about how to choose the right goods whereas sellers are confronted with the problem concerning how to set up online shops and provide commodities. Based on signaling theory and research findings about regional economics, we put forward an analysis model between the difficulty in identifying quality of goods and the quality signal intensity of geographic location, and make an empirical test by the actual data from Taobao.com. What this study finds is that, under the environment of C2C e-commerce in China, the geography location may affect the distribution of these online stores and their sales performance. For local specialty products, the quantity and the average sales of seller stores from the origin locations are more than those from the other locations; for the branded consumer electronics, the quantity and the average sales of seller stores from the first-tier cities are higher than those from other cities.

Keywords: C2C e-commerce, Geographic Location, Signaling Theory, Regional Economics

1.   INTRODUCTION

Traditionally, the geographic location is very important for a physical retail store, the location with dense population is more beneficial to sales when taking convenience and shopping cost into account [1, 2]. Compared with the physical retail stores, consumers make transactions from the physical space to virtual space that is free from constraints of the geographic location. Therefore, most previous studies suggested that purchasers are more sensitive to price but less sensitive to geographic distance when purchasing via an electronic channel rather than a physical channel [3-5]. From the perspective of supply chains, the relevant works have demonstrated that the electronic channel can make the geographic location no longer have competitive advantage for suppliers as buyers can find more suppliers or bypass intermediary business easily through electronic channels [6, 7].

In recent years, online retail market in China has developed rapidly. According to the report from China e-Business Research Center (abr. CECRC) [8], by the end of June in 2012, the number of e-commerce users in China has been up to 214 million with yearly growth amounting to 23.7%, its size has been 511.9 billion Yuan RMB with yearly growth reaching 46.6%, and the number of C2C (consumer to consumer, abr. C2C) stores reaches up to 17.25 million with a yearly growth of 19%. However, in C2C online market, there are a large number of independent stores with different reputation and all kinds of goods with varied quality. In addition, there is also a remarkable difference in sales among different stores with diverse items. Compared with purchasing from traditional physical stores, consumers' expending through Internet can only search and browse the information about sellers and products provided by the websites but they cannot touch or experience products, which means information asymmetry and uncertainty risks for consumers. Pavlou [9] pointed out that there are some major uncertainty risks in economic, personal and private aspects as well as sellers' performance, but the perceived risk can affect consumers' purchasing intention. Park and Kim [10] found that, information quality, user interface quality, and security perceptions influenced information satisfaction and relational benefit,

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which, in turn, were significantly linked to each consumer's actual purchase behavior. Then, in the online C2C market, for consumers, how to choose the right goods and sellers from numerous online stores? In contrast to traditional physical shops, is it the geographic location registered by sellers really not important for consumers? For sellers, do different geographic locations registered have an impact on sales?

Some scholars have supposed that the geographic location still plays a significant role in e-commerce. For example, based on the analysis of transaction cost theory, competitive advantage and social network, traditional local sellers have regional advantages to supply service for local customer through Internet when comparing with non-local online sellers [11, 12]. From the consumers' perspective, the geographic and spatial factors may influence individuals' decision-making when adopting online shopping. To be more specific, urban residents tend to purchase more frequently than rural residents, and there are various shopping habits among people in different regions for different types of products [13]. Having considered the two concepts of similarity and familiarity which affect purchase decision-making during online shopping, Edwards etc. [14] found that geographic distance occasionally could impact the psychological distance, further consumers' trust and eventually consumers' online purchasing decision. In view of the convenient logistics and delivery, some scholars have supposed that geographic locations have some effects on the efficiency of logistics, delivery cost and convenience, finding that consumers tend to make purchase from immediate sellers in order to achieve quick delivery [15, 16].

For Chinese C2C e-commerce markets such as Taobao shopping website which covers a large number of nationwide sellers with different locations and supply channels for providing goods with various prices and qualities, do consumers concern about locations of sellers when facing a great many sellers? Whether buyers' concerns about the location are different for different types of products? As to sellers operating online shops in C2C e-market, do they consider the registered shop locations? Nevertheless, relevant studies on above questions, especially for Chinese C2C electronic market, have not been found.

Considering that the virtual digital products on the Internet (e.g. mobile telephone rechargeable card, game point card, etc.) do not require logistics transportation, and have no difference in qualities, we suppose they are geographic irrelevant and only focus on small physical products which are easy to transport. Based on signaling theory of information economics and corresponding research findings of regional economics, we collect the actual sales data from the Chinese largest C2C website (i.e. Taobao.com). The data is concerned with two types of products, including local specialty products with obvious geographic features and branded consumer electronics without an evident geographic feature. We explore the effects of different registered locations on the quantity and average sales of sellers, finding that the seller's quantity and average sales for the two types of products are significantly correlative with their registered geographic locations. This will provide practical reference for sellers to set up online shops in C2C online market and C2C online shopping websites to supply services.

2.   THEORETICAL BACKGROUND AND HYPOTHESES

The signaling theory and relevant research results of the regional economics mainly provide theoretical foundations.

2.1. Theoretical background

The signaling theory originated from the labor market research of the Information Economics. Due to asymmetric information, employers tend to be unaware of candidates' working ability but they can assess it through some observable individual attributes as signals [17]. In the market where the information is asymmetric, the signal senders (e.g., individuals, products or enterprises possessing potential quality) sends signals to the signal receivers who observe and interpret these signals to determine whether to select the signal sender

according to their quality of the signals [18]. It is acknowledged that observability and signal cost are important factors of the signaling theory, thus consumers can check observable signals of sellers and weigh the costs of different signals to make decision [19]. Edwards etc. [14] pointed out that commodities themselves would be attached by a number of attributes which consumers were well familiar to. If there was a significant difference between these attributes and what consumers actually perceived, it would make a corresponding psychological distance and strengthen distrust, making consumers realize uncertainty risk and then choose risk aversion. Conversely, if none or less difference between the two objects mentioned above, the psychological distance would be reduced with increasing trust that leads to the possible purchase intention or behavior. In C2C online market, e-commerce websites normally provide buyers with some basic information concerning sellers and products. What's more, they also tend to offer search and sort tools which can filter as sellers' reputation, transaction records, registered geographic locations and selling prices, freight, etc. The information is observable with lower search cost for purchasers, which can aid them to make purchase decision and decrease the risk of uncertainty caused by information asymmetry between buyers and sellers [20-23]. Traditionally, compared with the physical shopping, whether the registered geographic location is an important quality identification signal for consumers' purchasing decisions is worth further exploring.

Regional economics provides theoretical explanations for traditional industrial regional clusters. Porter [24] supposed that, similar industries clustering in a region would supply firms in the region with competitive advantages. For instance, Silicon Valley of USA, a typical electronic product industry cluster, has brought about the culture and competitive advantages for companies situated in Silicon Valley [25]. Agricultural products with competitive advantage may also generate clusters for local specialty products, making some countries implement regulations aiming to preserve local specialty products protection through geographical labels [26]. These labels are constructive to aid consumers to check the quality, reputation and other features of products from specific regions [27]. In the first-tier cities or other regions characterized by dense population, there are a large number of traditional physical stores selling kinds of products with distinct sales. However, whether C2C online stores distribute and sales are like physical stores, and affected by registered geographic locations?

The premises of the signaling theory are information asymmetry and quality differences among trading products and services, and thus consumers need to adversely judge the corresponding quality on the basis of observable information. Studies on the geographic features have shown that geographic labels are strong quality signals for consumers when they have difficulties to identify the local specialty products. Combining the above analysis, we can infer that the degree of difficulty for consumers' identifying the quality of commercial items will affect the choice of geographical labels as a quality signal, and thus the performance of the geographic features of sellers (see Figure 1). The more difficult the quality of products is identified, the more evident geographic characteristics embody the quality signal. In contrast, if the quality of the commodities is easily identifiable, consumers tend to be less concerned about the geographic features.

Figure 1. Analysis model for the study

2.2. Hypotheses

In C2C e-commerce websites, there are a great number of similar products and sellers with fierce competition, which means that difference in sales is remarkable and even some sellers with no sales for almost every sort of products. Therefore, in order to fully compare the different sellers' sales due to the difference of registered geographic locations, we make separate comparisons for all sellers and part of sellers who having sales
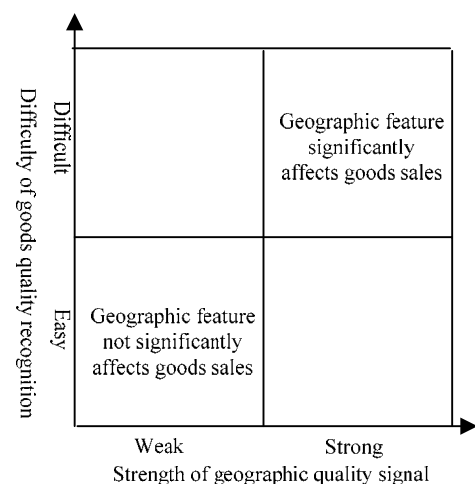
performance. We compare contents of different sellers with a wide range of registered geographic locations, mainly including the average sales over the last month and the number of sellers with the corresponding registered locations. If labeling sellers with no sales as death but sellers with positive sales as survival, we evaluate the likelihood of sellers' success in terms of the ratio of the number of sellers with sales divided by the number of all sellers as the region sellers' survival rate. In the paper, this ratio is named by Vitality Index of Regional Stores (abr. VIRS) and presented by the following formula, that is:

VIRS = the number of sellers with sales / the number of all seller in the same location   (1)

As for consumer electronics (e.g. digital camera, mobile phone and MP3), Overby and Forman [3] supposed that the products were irrelevant to the geographic location in online shopping market. However, in contrast to the second-tier cities in China, the first-tier cities have access to more developed logistics, shorter supply chains, more channel resources, and better reputations; this will make more sellers establish shops on C2C e-commerce market correspondingly. In addition, the markets of such developed cities are well operated and regulated, which lays a foundation for stimulating the emergence and spread of the latest consumer electronic products. Consequently, the first-tier cities, to some extent, reflect the quality of genuine products. Because there are some fake and shoddy electronics products in Chinese markets, it is difficult for consumers to identify the genuineness and quality of these products in C2C websites, and thus they will try to take the observable information provided by websites as quality signals to recognize various sellers and the quality of commodities as well. Therefore, whether the registered locations of sellers are the first-tier cities will be an important quality signal for consumers. Then, online consumers will be more likely to choose products from the first-tier cities, which will lead to sales' difference between the first-tier cities and other regions. Thus, in the C2C online shopping market, we propose the following hypotheses:

H1a: For branded consumer electronics, the number of sellers is larger in the first-tier cities than in the non-first-tier cities;

H1b: For branded consumer electronics, the average sales of sellers are higher in the first-tier cities than in the non-first-tier cities;

H1c: For branded consumer electronics, the VIRS of the first-tier cities is higher than that of the non-first-tier cities;

For local specialty products (e.g. the West Lake Longjing tea, Ningxia wolfberry and Jingdezhen ceramics), they have obvious geographical features known for most consumers. Previous studies stated that origin labels of such sort of products mentioned above not only provided consumers with an essential signal of product quality, but also offered small businesses from origin location potentials for being easy access to the target market [27-29]. Most of local specialty products in China are the primary processing products with underdeveloped marketing channels, but the origin sellers have comparative advantages in resources, enabling more sellers of origin to distribute such products through the Internet. Most of consumers are aware of the geographical attributes of local specialties, but few of them can identify the quality of these commercial items. In this case of asymmetric information, if buyers want to purchase such quality goods, the geographic location has apparently become an essential signal for identifying quality; moreover, if consumers directly purchase from place of origin, it will reduce intermediate sales links; this will result in the difference of sales between origin and non-origin. Therefore, in C2C online market, we make the following hypotheses:

H2a: For local specialty products, the number of sellers is larger in the location of origin than in the location of non-origin;

H2b: For local specialty products, the average sales of sellers are higher in the location of origin than in the location of non-origin;;

H2c: For local specialty products, the VIRS of the location of origin is higher than that of the location of

non-origin.

3.   RESEARCH METHODOLOGY

According to the categories of products and types of geographic locations, the research data is divided into four (2 x 2) groups. To be more specific, the actual sales data is obtained from the Taobao website, which is paired and analyzed using Analysis of Variance (abr. ANOVA) method. It is noted that Taobao is the most popular C2C online shopping platform in China that has nearly 500 million registered users, more than 60 million regular visitors daily, more than 800 million online products and 48000 products sold per minute. According to the report of China Electronic Commerce Research Center [8], Taobao is still in the monopoly position on C2C markets with 94.5% of the entire C2C market share in June 2012.

3.1. Variables and encoding

The types of sellers' registered geographic locations in C2C online shopping are set as independent variables, which also serve as binary variables. To be more accurate, for the local specialty products, registered geographic locations are classified into the origin and non-origin, whereas for branded consumer electronics, the types of registered geographic locations are categorized into the first-tier cities and non-first-tier cities. The criteria for the classification of the first-tier cities is that, Beijing, Shanghai, Guangzhou, Shenzhen and Hong Kong belong to the first-tier cities, the rest of other cities in China are belong to the non-first-tier cities [30]. The basic units of dividing locations of origin or non-origin are provinces or municipalities. The dependent variables are the number of sellers and corresponding sales in the C2C online shopping platform. In light of enormous factors (e.g. selling prices, sellers' reputation) influencing sales of sellers, we take the average sales of sellers from each type of geographic location as the dependent variable. The specific variable encodings and rules are showed in Table 1.

Table 1.   Variables encoding and rules

Encoding	Meaning	Rules
ID	Identity code of goods	Integer
Goods	Name of goods	
GsType	Type of goods	1 represents local specialty goods,2 represents consumer electronics
LocType	Type of location	Values 1 and 0: For the local specialty, 1 represents origin, and 0 represents other; For consumer electronics, 1 represents the first-tier city, and 0 represents other
AvgSales	Average sales of all sellers	Non-negative decimal
SellersNum	The number of all sellers	Non-negative integer
N0_AvgSales	Average sales of sellers with sales performance	Non-negative decimal
N0_SellersNum	The number of sellers with sales performance	Non-negative integer
VIRS	Vitality Index of Regional Stores	Non-negative decimal, values 0~1

3.2. Data collecting and processing

Data were collected from Taobao in July 2012. According to the requirements of this study, we determine the principles of data acquisition: 1) products with better sales among the similar sort and covers many sellers from

different types of locations; 2) for the local specialty products, we mainly choose the primarily processed products (e.g. Ningxia wolfberry, Xinjiang raisins) in order to highlight the geographic correlation; 3) for consumer electronics (e.g. digital camera, mobile phones, MP3), we select International or Chinese well-known brands so as to emphasize the geographic independence.

The final data result is that, for local specialty products, at least two kinds of goods from each province or municipality including that, total 104 kinds of goods covering 30 provinces or municipalities, 22778 sellers records; for consumer electronics, total 65 of brands , 37440 sellers records. The specific statistical results are shown in Table 2.

Table 2.   Statistical results for the research

Local specialty products		Branded consumer electronic products	
Product number	Sellers number	Product number	Sellers number
104	22778	65	37440

Taking initial processing for these two types of data collected separately, the local specialty products were divided into two groups of origin and non-origin and the consumer electronic products were classified into two groups the first-tier cities and non-first-tier cities. Then we made statistics the number and the average sales of all sellers and sellers with sales.

3.3. Results

After initial processing two types of data about online products, we make descriptive statistics (see Table 3). Before conducting ANOVA, we made data checking, excluded two abnormal records of products in the branded consumer electronics, and then carried out one-way ANOVA analysis for the two types of geographic locations and two types of products separately (see Table 4). The results show that for branded consumer electronics, the number of all sellers and the sellers with positive sales in the first-tier cities are totally and significantly greater than that in the non-first-tier cities [$F(1,62)= 5.576$, $p<0.05$; $F(1,62)= 12.315$, $p<0.001$]; the average sale of all sellers and the sellers with positive sales are totally and significantly more than that in the non-first-tier cities [$F(1,62)= 8.932$, $p<0.01$; $F(1,62)= 3.985$, $p<0.05$]; the Vitality Index of Regional Stores in the first-tier cities are totally and significantly higher than that in the non-first-tier cities [$F(1,62)= 10.160$, $p<0.01$]. Therefore, the hypotheses of H1a, H1b and H1c are supported altogether. In contrast, for the local specialty products, the numbers of all sellers and the sellers with sales in the locations of origin are significantly greater than that in the locations of non-origin [$F(1,103)=11.140$, $p<0.001$; $F(1,103)= 9.710$, $p<0.01$]; the average sales of all sellers and the sellers with sales in the locations of origin are significantly more than in that in the locations of non-origin [$F(1,103)= 30.940$, $p<0.001$; $F(1,103)= 38.740$, $p<0.001$]; the Vitality Index of Regional Stores in the locations of origin are significantly higher than that in the location of non-origin [$F(1,103)= 6.443$, $p<0.05$]. Consequently, the hypotheses of H2a, H2b and H2c are supported.

Table 3.   Description statistics for two types of goods

GsType	LocType	Variable	Mean	Std. Dev.	Min	Max
1	0	AvgSales	3.58	5.95	0.00	40.11
		SellersNum	83.40	119.40	1.00	832.00
		N0_AvgSales	10.17	12.82	0.00	66.37
		N0_SellersNum	26.12	49.48	0.00	379.00
		VIRS	0.30	0.18	0.00	1.00

1	1	AvgSales	9.44	8.94	0.10	54.31
		SellersNum	135.62	105.83	13.00	659.00
		N0_AvgSales	25.01	20.67	2.82	97.67
		N0_SellersNum	45.32	38.74	2.00	265.00
		VIRS	0.35	0.13	0.03	0.90
2	0	AvgSales	4.64	7.67	0.03	48.06
		SellersNum	197.86	299.41	6.00	1576.00
		N0_AvgSales	22.89	28.31	1.00	129.00
		N0_SellersNum	27.54	44.89	1.00	299.00
		VIRS	0.17	0.13	0.03	0.60
2	1	AvgSales	7.17	7.89	0.49	42.46
		SellersNum	378.14	525.77	17.00	2403.00
		N0_AvgSales	28.14	21.22	3.50	103.01
		N0_SellersNum	66.17	78.04	5.00	431.00
		VIRS	0.24	0.13	0.06	0.65

Table 4.   ANOVA results for two types of goods

GsType	Variable	F	Prob > F
1	AvgSales	30.940	0.000***
	SellersNum	11.140	0.001***
	N0_AvgSales	38.740	0.000***
	N0_SellersNum	9.710	0.002**
	VIRS	6.443	0.012*
2	AvgSales	8.932	0.003**
	SellersNum	5.576	0.020*
	N0_AvgSales	3.985	0.048*
	N0_SellersNum	12.315	0.001***
	VIRS	10.160	0.002**

Notes*: P-value<0.05   **   P-value<0.01   ***   P-value<0.001

In order to view the results more conveniently and intuitively, we numbered the two types of products as Goods ID in the order, took Goods ID as the X-axis, and took the number of sellers or the average sales of two types of products as Y-axis, and then we made drawing of comparison between different regions. For the local specialty products, the drawing results of the average sales and the number of sellers are shown in Figure 2. On the other hand, for the branded consumer electronics, the drawing results of the average sales and the number of sellers are shown in Figure 3. Obviously, it can be seen from the figures, most of the number of sellers and the average sales in the type 1 locations are greater than that in the type 0 locations.
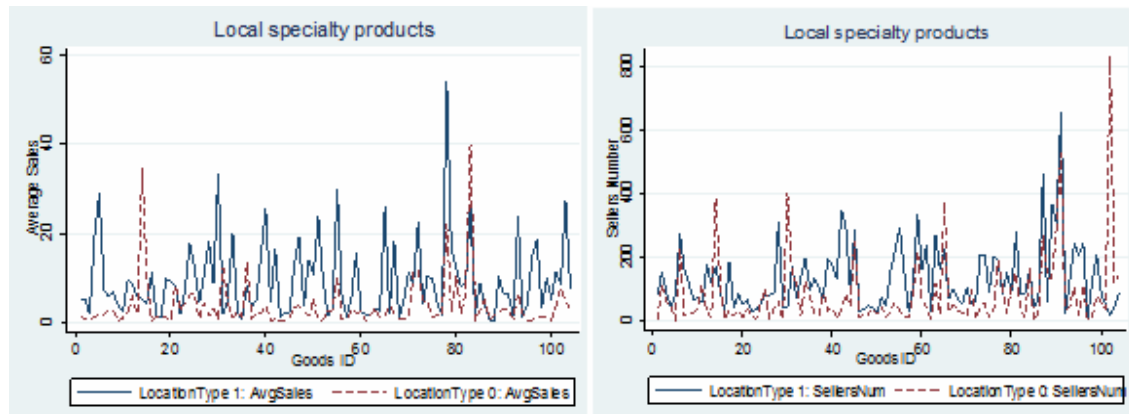
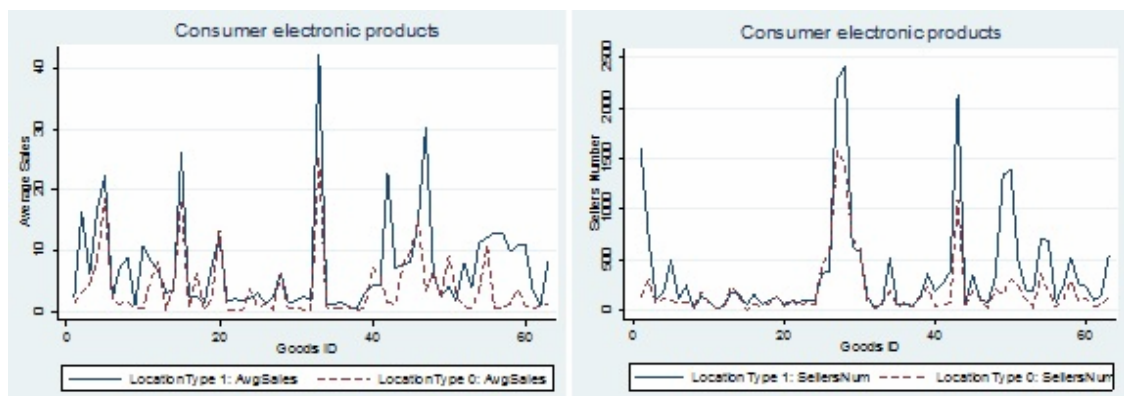**Figure 2.   Comparison results for local specialty goods**

Figure 3.   Comparison results for consumer electronics

4.   CONCLUSIONS AND DISCUSSIONS

In this study, there are three main findings presented as follows. Firstly, we provide the analysis model to explore the internal relationship between the difficulty in identifying commodities' quality and the strength of geographic quality signal, and make an empirical test by using actual sales data from Chinese Taobao website, which provides the reference of theoretical framework for similar studies in the future.

Secondly, based on the theory of Regional Economics, traditional industries and business clusters have a positive effect on the distribution of C2C online stores. Specifically, the number of sellers relevant to branded consumer electronics in the first-tier cities is significantly more than that in the second-tier cities, whereas for local specialty products, the number of sellers in locations of origin is higher than that in locations of non-origin.

In addition, according to the signaling theory, the locations registered by sellers under the C2C online shopping environment can be taken as quality signal of products, which impacts consumers to make purchase decision. Specifically, for branded consumer electronic products, consumers tend to opt for the sellers registered in the first-tier cities rather than the second-tier cities. However, for local specialty products, consumers are more inclined to choose the products of sellers registered in the locations of origin than those in the locations of non-origin.

Previous geographic studies of Regional Economics supposed that the geographical labels of local specialty products can be used as an important signal for consumers to identify quality and can influence consumers' purchasing decisions [27, 29]. From the perspective of the signaling theory, the premises of individuals to choose observable information as quality signals are information asymmetry between buyers and sellers, and difference of quality for products or services offered by different sellers. As long as the signaling theory's premises exist,

we can apply the theory to engage in conducting research on e-commerce. The study makes compensation for the researches of C2C e-commerce. For branded consumer electronics, the geographical attribute of the first-tier cities is also an essential quality signal for consumers as an influencing factor for their purchasing decisions. Therefore, not only do the local specialty products are attached to corresponding geographic attributes of origin, but also branded consumer electronics are featured by corresponding geographical attributes of the first-tier cities. This will provide a reference for future research about studying the geographical attributes of other products in C2C e-commerce environment.

The results of this study have practical implications for potential online sellers as well as existing online venders. For the former, they should choose appropriate geographic locations to register according to types of products. For local specialty products, sellers should choose the corresponding locations of origin to register to obtain comparative advantage, whereas for branded consumer electronics, sellers should choose the first-tier cities to acquire comparative advantage. For venders of C2C e-commerce sites, they can take targeted measures to attract businesses in order to improve efficiency and reduce costs.

5.　LIMITATIONS AND FUTURE STUDIES

There are three limitations in this study. Initially, we explain the hypotheses based on the signaling theory and the previous findings of Regional Economics rather than surveys of consumer questionnaire. It means that it lacks the support of consumer' subjective data and thus it might exist biases between the theoretical explanation and subjective decision-making of consumers. Second, to facilitate the process, we do not take into account other influencing factors such as selling prices, freights and seller reputation. In order to control the impact of these factors, we take sellers' average sales in accordance with types of products and geographic locations. In addition, we adopt ANOVA method to analyze data without providing the explanation indicator of R-squared. Third, the kinds of commodities may not be sufficient, which requires further strengthened to further test the hypotheses.

In spite of the above limitations, this study, based on the signaling theory and the geographical perspective of Regional Economics, makes a new supplement for the research on consumers' shopping decision-making in Chinese C2C e-commerce. It also provides practical implications for sellers who intend to run shops in C2C online shopping sites. To compensate for these limitations, the follow-up study will be carried out in line questionnaire research, and the amount of data collected for types of products required to be increased. After controlling other influencing factors, a comparison test between the objective data from online shopping sites and the subjective data from survey questionnaires will be conducted to promote the explanation level.

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