Study on Pricing Model of Online Auction under Competitive Strategy

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Abstract—E-commerce auction has the auction properties unlike ordinary e-commerce transactions. The online auctions, allowed bidding, become into a new trading model based on the network for the exchange and auction technology. This paper firstly gives the overview of the online auction pricing mechanism and introduces the e-commerce auction market and its characteristics on the one hand. On the other hand, it discusses the factors affecting the price of online auctions from three aspects, the information flow, the business objectives and the risk factors. And then, it discusses the six types of e-auction pricing strategy. Lastly, facing the factors and the different strategies, it presents the win-win pricing model on the online e-commerce auction British-based both for auction operators and consumers.

Index Terms—e-bidding, auction, pricing strategy

I. INTRODUCTION

Online auction means that the individual and business achieve price negotiations transactions via the Internet. E-commerce auction allows the pricing competition, determined by consumers to value one particular commodation, and bidding, and then, businesses choose whether to accept the offer of e-commerce activities. The sellers have increased competition through the Internet trading patterns, so the buying behavior of consumers becomes increasingly complicated and more cautious for network information processing. If the buyers and sellers can trust each other and smooth transactions, it will be able to bring more benefits for both sides.

A. Characteristics of Online Auction Market

Auction trading model, the seller can decide the type of auction items and the commodity prices, but the other buyers can participate in bidding, and even decide the final selling price of goods. The auction site offers trading platform for the two sides, who can trade activities in this virtual platform. Since a web auction model of web page type is with around the clock without rest, coupled with global number of Internet users, so the opportunity of auction merchandise transactions are more available than the traditional auction market [1].

Online auction is a new auction, which have some new features and mechanisms compared to traditional auctions. Firstly, the online auction breaks through the traditional auction in time and location constraints, and it should be more free, more flexible, more efficient, as well as lower operating costs and participation costs for auction. Secondly, they have the variety of different types of auction items [2]. Taking into account the cost of the auction, the value of products in traditional auction sale is generally high, while for the online auction, its range and types of auctions keep up to date with the pace of market demand, containing the works of art on hundreds of millions of dollars, real estate, and some snack foods on one or two dollars. Buyers and sellers can just be an auction addiction. Thirdly, they have the different ending fashion. At present, the online auction mainly uses two kinds of ending fashion. Firstly, it finished in accordance with the prior end time of the auction, such as eBay's auction rules; and the other is similar to the traditional English-style ending way of the auction rules, "3G" rules, that is, at the end of auction, if customers bid, it could also extend the time of auction, for example, Amazon's auction rules. Lastly, as the online auction continues for a long time, most of the websites provided the tender agent to bid a fair and rigorous way to help customers, which are more convenient and effective for participation in the tender [3]. And bidders do not need to keep in the computer from time to time for auction progress, which is difficult to achieve in the traditional auction. In addition, the bidders also handle more complex transactions, so the auction rules may simultaneously adjust the bid requirements and dissemination of information.

B. Domestic Online Auction Market

On a global scale, the online auction market includes eBay and other major players in dozens of auction sites, and hot areas are mainly in the United States and European countries. And e-Bay, Yahoo, Amazon, uBid,

QXL, and Overstock six are the leaders in home situation. With the high-speed growth of TaoBao and steady development of eBay, the online auction users in Mainland China have expanded rapidly. According to the statistics showed that by 2006, Chinese registered users of online auction have exceeded 30 million, and an average annual growth rate is of 43 percent [4].

Domestic online auction market has the following characteristics. Inexpensive products occupy about half of the share. There are also a certain amount of high-end auction items, such as real estate, but the area is still lagging far behind foreign countries. In the auction site, the ranks of professional sellers are stronger, which suggested that C2C mode and B2B models are interlinked. At the same time, the competitors in C2C platform and B2B platform apply the availability of resources and integration of the conditions. The online auction market in the next few years will continue growth rapidly, and the size and turnover of the user of online auction will be rising fast. So China's online auction market also need to strengthen in the competitive mechanism, pricing models, and credit mechanisms, in order to attract more consumer market.

II. FACTORS AFFECTING THE PRICE OF ONLINE AUCTIONS

A. Formating Mechanism of Auction Price

Auction sites are available to a public space for the sellers, so that the sellers can provide the product images, product information and commodity prices of auction to visitors for reference, and the more important is the commodity prices of auction, and even some buyers will consider the current bid commodity, bid price, the reserve price and other price information. The supply and demand in market determine the market price [5].

B. Factors Affecting the Price of Online Auctions

The pricing decision-making for commodity is a complex process. Sellers not only need to consider the cost of goods, as well as many other environmental factors, so as to the Online auctions pricing, which will be subject to many factors, such as the impact of external factors and internal factors, for example, economics, culture, political environment, and the cost of the product itself, even competition, as well as demands, time value, and risk factors. The specific factors can be summarized as follows.

Firstly, decision-makers obtain the relevant information for commodities through various channels, which stimulated decision-makers' potential demand for investment, then there is the impulse to the online auction of goods, and also with pricing decisions for the online auction commodity [6]. For the use of the Internet auction sellers of goods, the pricing decisions of external incentives are the information flow, and internal motivation is the investment demand. The information flow on online auction of goods contains the market demand information for the commodity and historical data related on-line auction items. The greater this

information flow, the better for pricing decisions of policy makers.

Secondly, different decision-makers have different business objectives in the use of online auctions. For example, some sellers hope to improve the corporate image; some sellers In order to operate the long-term business on the online auction, are willing to sell low-priced auction items; and others want to win favorable rates online. As the auction sellers' the business goals are different, the sellers' pricing decisions affect pricing decisions. And the different objectives embodied in the different pricing decisions, such as maximizing revenue as their goal, the greatest probability of turnover as the goal, and having long-term business goal.

And lastly, Both for the seller and the buyer, the online auction have risks. Online auction basically carried out through the auction system, and the virtual network can complete the transaction not meeting with each other, so the risks of online auctions have been much greater than the other forms of business activity. Because of the electronic media, buyers and sellers can not reach physical transaction objects, so the greatest risk of online auctions comes from the transaction information asymmetry. For the seller, the buyer's credit risk is the most important risk factors. If the buyers do not buy goods after bidding, the seller will pay closing costs at this time but did not sell merchandise. Sites are difficult to prevent a user to register multiple users, and the user's true identity is sometimes difficult to ascertain. And the buyers' fraud is also divided into categories. For example, a buyer bids for a similar item using a different pseudonym, which made the price have increased because of the multiple tender, and this also made some potential buyers can not bid. And then, in the last moment of the auction, the buyer would withdraw its high bid, so that he only earned a very low bid price of goods. Some bidders will reduce the level of competition through collusion, thereby reducing the transaction price of goods. In addition, for defective items, buyers may trying to get a refund before return an article, but once a refund, they do not return the items. In order to avoid such risks, there are auction credit evaluation system, and third-party hosting services. For example, in order to win the trust of shoppers, TOM eBay launched a third-party hosting services. And on the one hand, the payment and delivery process risks not only increase the cost of sellers, but also affect their long-term business and demolish its reputation. Sometimes, the seller can not determine the success buyers will pay or not [7]. On the other hand, for the buyers, the risk in the online auction process contains the following reasons. The security risks in the payment process, including transportation costs and lost time-consuming effort, as well as the risk of online payment, is the first risks. And then, the purchasers are not satisfied with bidding goods, which included the sellers' fraud, for example, non-delivery of goods, and the false description. If the buyer used a credit card payment, sellers sometimes have the buyer's name and credit card numbers, easily lead to financial fraud. The seller uses a better picture than the actual items, even false images to describe the

items to be auctioned. In many cases, the auction items do not match the actual goods and are different from the buyers' understanding and expectations. And even the sellers increase the implicit costs in order to make themselves more benefits after the auction. Lastly, the sellers sell black market items, including copies of software, music CD, and video, which do not require packing boxes, warranty certificate, and instructions [8].

C. The Impact of Auction Evaluattion for Pricing

Another feature, valued by participants in online auctions, is the user rating system, the credibility of the evaluation system. Most auction sites have established a credit rating system to record each user's transactions in the past received evaluations, which converted to a reputation score through weighted average method, representing the users' credibility in a virtual trading market. Relevant research from eBay, acquired by TOM, argued that the higher the score of the seller's reputation, the greater the likelihood auction [9].

As buyers and sellers are subject to sites' reputation evaluation system, a seller's credit scores online transactions have become an important decision variable [10]. While for the transaction price of the auction in terms, the study found that the buyer's bid is directly related to the valuation of the goods, but there is no significant contact with the seller reputation.

III. The Types of Online Auction Pricing Strategy

Traditional auctions are divided into four basic types, English auction, Dutch auction, first-price sealed auction and second-price sealed-bid auction. Based on the auction of the traditional classification, online auctions are divided into the following several types.

Online English auction is a forward auction format, whose rules contain that the second bidders bid higher than the previous one, and the highest bidder obtain the right to purchase merchandise when the auction reached the bidding deadline [11]. In the auction process, bidders can browse through the history of the price to determine their maximum bid on the items to the system. When the auctioneer gradually made up-outcry and the bid is higher than the highest bid in the real psychological valuation, one person is refused, and the other one will success [12].

Online Dutch auction is a public auction of price reduction. Dutch auction transactions are large amount of items mostly [13]. If a seller has a large number of identical items to sell, he can use the reverse auction format. Different from the traditional Dutch auction, online Dutch auction principle is: in the absence of the price decline, at the end of the generally bidding deadline, the highest bidder get the number of commodities as he needs, and if there is residual goods, they was taken up by the second highest bidder[14]. In the auction process, the buyer can accept all outcries below their psychological valuation, and in order to maximize return, he can also choose to outcries close to other buyers' psychological valuation.

Collective bargaining is different from the traditional type of online auctions, which is no bidding process [15].

The auction website provided the collective price based items price, starting price, and then, a large number of buyers constitute a large shopping group landing the seller registration form before the items indicated by the number of different levels. The more the number of buyers, the price will be lower, but usually there will be a minimum price [16].

Bargain hunting buying is unlike a traditional auction. In this transaction form, buyers can not join the online auction bid for goods temporarily, but chose price paragraph according to the goods' price curve. Once the commodity prices shoot down on this price segment, the system will send a notification, telling buyers that the number of the current collection has reached the price he wanted, and he would join a collective automatically.

Reverse auction is pricing from the seller, which competes for the chances that the sellers provide consumers with services [17]. Reverse auction can provide consumers' demand for the products, service demand and price positioning, as well as other related information, and then, the businesses on a competitive basis decided the final product and service providers, which enable consumers to achieve optimal performance and low cost.

Buy it Now means that the seller fixed the price of the goods before the transaction, so buyers have no room for bargaining. After completion of the transaction, buyers paid according to a price. If the seller sold more than one commodity, the transaction will continue until the buyer to purchase all the goods.

In 1981, Myerson, Riley and Samuelson showed that the general conditions of Vickrey revenue equivalence theorem [18]. In many risk-neutral potential buyers, the private valuation of auction is subject to a common increasing distribution and independent of each other, and then the auction will have the same expectations of income based the following conditions. The buyer with the highest signal is always a winner; the remainder of their expectations is zero for all the buyers with the lowest valuation. With this condition, under the complete information of online auctions, the results of single auction are the same for the different types, that is, the traded price is the second highest psychological assessment, and the sellers' earnings is also the second highest psychological assessment [19].

IV. The Win-win Pricing Model on The Online E-commerce Auction

A. Pricing Making Index System

There are these following prerequisites studied in this paper on the online auction items.

(1) The on-line auctions items used the online English auction way, there is proxy bidding mechanism.

(2) When the seller vendors want to sell the goods under the online auctions merchandise, an auction of the film for a number of auction items is a single piece for every customer.

(3) There are the initial decision-making analysis under the auction, while setting the starting price q and the reserve price r.

(4) The minimum bid increment is ε (ε >0), which offers customers the smallest increment given in advance and fixed.

(5) The seller of online auction of goods does not set the duration of the auction automatically, that is near the end of the auction, buyers bid within a few minutes, the auction end time will not automatically be extended.

(6) The buyers are rational and experienced, who participate in the auction, and the valuation of goods from the buyer is the highest price of goods willing to pay for the auction.

The mathematical modeling of auction of goods on the online auction pricing decision-making process involves a series of indicators. And the modeling of variables needs to use a precise definition, specifically as shown in Table I.

TABLE I.
PRICING MODEL INDEX TABLE

Index	Definition
q	The starting price q
$R(r)$	The maximizing the return
r	The reserve price r.
ε	The minimum bid increment
T	The entire time length
T_n	The each time point
P_n	The current commodity prices
P_N	The commodity's price at the end of auction
V_h	The maximum rate of new entrants' upper limit
F(V)	The customer valuation distribution function
V_n	The rate of new entrants' upper limit
K	The number of times from the reserve price r to the maximum
V_m	The seller's utility of the auction of goods;
O_{Pn}	the opportunity cost of the commodities' prices
$C_d(r)$	The cost of sellers to list the auction items, whose value is ralated with reserve price;
$C_c(P_n)$	The pay of sellers after closing the transaction's costs,
α	The interest factor M is for of the opportunity cost;
β	The risk factor of the opportunity cost
M	The final price of auction items
P_{ri}	The final transaction price

B. The Time Factors of Win-win Pricing Model on E-commerce Online Auction

Online auction pricing decision-making process is a dynamic process, and one part of the auction process in the online auction of goods, which will be step in line with the auction process, and this decision-making starts from the registration of the auction items and extends to the end time of arrival of the auction [20].

The time factor is one important factor to consider for the seller when he made pricing decisions, because it directly affects the valuation of goods for auction buyers.

If the bidders have sufficient time to participate in the entire process of the online auctions' merchandise, he can raise the price by the bid rate in online auctions minimum gradually until it reaches the highest auction items he was willing to pay for the goods. And if the other buyers bid the goods beyond the highest auction items he was willing to pay for the goods, he will withdraw from the auction. Taking into account the online English auction rules, if multiple buyers bid for the same price, the auction will make the distribution of auction items according to rules of "first offer, first served" [21]. Therefore, the buyer looks to be successful in the auction of goods, the optimal bidding strategy is to pay the price of goods by the original intent of the auction to the goods valuation, of course, he also needs taking into account risk factors.

Therefore from the comprehensive analysis of two points above, the optimal bidding strategy of the bidders who participate in the process of online auctions of goods is to pay the highest price he will willing to for its valuation of the goods. The valuation of goods from bidders will affect the seller's pricing decision-making, following on the bidder's valuation analysis.

Customer valuation of auction's goods will subject to the following two factors.

(l) Bidders are the original valuation of second-hand goods, which is not subject to any factors that impact the valuation of second-hand goods.

(2) Bidders degree of influence by the outside information, where the external information includes second-hand goods market prices and demand, online auctions have been carried out in time, online auction, the current price of second-hand goods, has the frequency of bids.

When the bidder has not received any price outside information, the bidders were not other factors impact on the valuation of goods for auction is still the original valuation [22]. When the bidders were able to obtain and online auctions auction items related to all the information, the bidders were the valuation of goods for auction only with the obtained information about the outside world, but its valuation of the auction items unrelated to the original. Actually in the process of online auctions auction merchandise, the customer is not possible to obtain all the market information, but can only get part of the market information, so information on the bidder's valuation of the outside world there is some of the impact. The number of bidders, such external factors can be performance through the time indirectly. As time progresses, the customer arrival rate will be certain, and the number of bidders and the number of bidding will increase, and then the most visible manifestation is that the current prices of the auction of goods will increase in the auction process as time progress. Therefore, in the main analysis time here, the potential bidders for the impact of human valuation.

As time progresses, the customer arrival rate certain circumstances, has led to the current commodity price increases the auction. Network openness of information, allowing new entrants into the auction process, bidders can see in front of all the bidders who bid situation, access to part of the price information. At the same time, new entrants into the potential bidders who bid the psychological as time progress, the current price increases have taken place in the following changes.

(l) The on-line auctions bidders, who has been entered the auction, have to bid on auction items, which will result in the increasing prices of auction items. The potential new entrants into the auction system will find existing prices of goods and competitors from the auction bidders in the state of competition in the auction items, and also will estimate the price of the auction's items in the future. Therefore, new entrants' bidders who produced the successful psychology and will also increase the valuation of its auction items accordingly in the fierce competition.

(2) The new entrants' bidders will make out the price analysis to those successful bid of bidders entered the online auction system, and found there were some affirmation from the other bidders for the auction in the value of goods. These kinds of consensus on the auction value of the goods will certainly the auction system, the valuation of potential bidders who played the role of positive feedback, making it to the auction to increase the valuation of goods.

(3) At the beginning of the online auction process, the starting price of the reference price of bidders into the auction system is q. As time progresses, the current price of the auction items rise, potential bidders entered the auction process will bid in the higher prices, so the auction reference price will be the current price of goods. By reference to prices, new entrants to the Bidder at this time than the first valuation of the bidder to enter the valuation have increased [23]. This shows that the bidders were on the auction items will be subject to a time limit of the valuation factors. As time progresses, at each moment the current price of auction items may be different, enter the online auction items to the auction process, bidders were the valuation of goods increased.

Because of the convenience of online auctions, bidders, who bid for each process, may only spend a few minutes or even a few seconds time, and the process of online auctions of goods is usually a few days ago. In accordance with the time consumed by each bid, the auction process can be divided into multiple stages, which reflects the impact to the time on the bidder's valuation. This paper divided whole process of online auctions of goods into N stages, each time point is of T_n. As Table Ⅰ shows, the entire time length of online auctions of goods T with N +1. In each moment T_n, the commodity's current price is P_N. At this time, the new potential bidders into the auction process are subject to the current commodity prices, the valuated range is [0，

V_n]. As time progresses, new entrants will bid within the range at the time T_n, which resulted in the next moment T_{n+1}, and the current commodity prices P_{n+1}, and then, the new price once affected the next time the valuation of the scope of the bidder again. After such a cycle, at the end of the auction time, the final auction price formed for terms. So the final price was decided by the scope of the bidder's valuation decision on the last time.

TABLE II.
AUCTION COMMODITY PRICES AND THE SCOPE OF THE BIDDER'S
VALUATION OVER TIME

Auction time	T_0	T_1	T_2	⋯	T_{n-1}	T_n	T_{n+1}	⋯	T_N
Scope of bidder's valuation	[0, V_0]	[0, V_1]	[0, V_2]	⋯	[0, V_{n-1}]	[0, V_n]	[0, V_{n+1}]		[0, V_N]
Auction commodity prices	q	P_1	P_2	⋯	P_{n-1}	P_n	P_{n+1}	⋯	P_N

The above analysis shows that each bidder who bid the auction of goods must spend a certain time. As time goes on, the current prices of auction goods increased, so the new auction bidders also increased the ceiling for the valuation of goods. Supposed in each moment, the maximum rate of new entrants' upper limit V_n for the current auction are the same to the rate of price P_n of goods. Therefore, in the time T_n, Bidders upper limit on the valuation of goods for auction are as follows:

$$\frac{V_n - V_{n-1}}{V_{n+1} - V_n} = \frac{P_n - P_{n-1}}{P_{n+1} - P_n};$$

$$V_n = \frac{(P_n - P_{n-1})(V_{n+1} - V_n)}{P_{n+1} - P_n} + V_{n-1}$$

Based on the above formula, it can obtain each time T_n on-line auction process and the auction limit of new potential bidders into the auction process V_n. In the solving process of V_n, firstly, they need to determine V_0. Throughout the auction process with all entered into the auction process, potential bidders were related to the valuation limit. As the online auction starting time, to enter the auction system, all potential bidders were Bidders only a small part, so the valuation of start time, Bidders is also far less than the initial valuation of the ceiling limit. Under normal circumstances, V_0 is the 50 percent of V_n. The above formula shows that, as time increases, bidders who bid for goods, making the current commodity prices, further also affected new entrants' the scope at this moment, and allowing new entrants into the auction bidding process, increased the ceiling of human

valuation, and then the next moment commodity prices improve.

C. The Win-win Pricing Model on The Online E-commerce Auction

In the current auction mechanism, the seller can decide the lowest price level he is willing to sell this product, namely reservation price. When the consumer is willing to bid higher than this reservation price, this transaction can be effective immediately. However, consumers can only know whether the seller had set the reservation price, but will not know what the reservation price is, so the highest bid of the purchaser must be higher than the reservation price set by the seller, which means the deal is a success. For the other model, if the buyer purchase the goods based on the direct purchase price set by the seller, this transaction will end immediately. Myerson theorem proved that in maximizing the price of the auction seller, optimal auction is with a price discriminatory in the case of asymmetric information. Therefore, when both sides ended the transaction, they can open Web platform to give advice and evaluation, so that both sides can maintain the security of transactions, but also provides a reference to the future of consumer transaction basis.

If the model makes maximizing their earnings as the targets of the auction pricing decisions based on a win-win decision-making between the sellers and the customers, the aim of the pricing decision-making on online auction items contains the performance goals and time targets for revenue, and time objectives can also indirectly through the opportunity cost that is also a seller as part of the proceeds. And at the same time, the time goals can also improve the efficiency of auction transaction, so as to win the return buyers. Based on the time factors of win-win pricing model on e-commerce online auction, The win-win pricing model on the online e-commerce auction is as follows.

$$\text{Max } R(r) = p[P_n(r) - C_d(r) - C_c(P_n) + O_{Pn}] - \overline{p}[C_d(r) + O_{Pn}]$$

$$s.t.$$

$$P_n \geq M;$$

$$P_n \geq r;$$

$$0 \leq q \leq r \leq V_K$$

$$O_{Pn} = \alpha\beta P_n;$$

$$M = V_m - O_{Pn};$$

$$P_n(r) = \sum_{i=1}^{i=k^*} P_{ri} P_{ri};$$

$$k^* = \frac{V_N - r}{\varepsilon}.$$

This model is based on maximizing the return $R(r)$ as the model's objective and decision variables is the reserve price. Among them, p and $\overline{p}$ indicated that online auction transactions probability and the probability of non-traded goods respectively; $C_d(r)$ is for the cost of sellers to list the auction items, whose value is related

with reserve price; $C_c(P_n)$ is for the pay of sellers after closing the transaction's costs, and its value is related with the final auction commodities' price $P_n(r)$, which is a function of the reserve price r as variables, P_{ri} is the various possible price in the transaction, p_{ri} is the probability of the various possible price. k^* is the number of times from the reserve price r to the maximum V_n of customers in the final valuation; ε is as bidder's the smallest rate of increase price; V_m is for the seller's utility of the auction of goods; O_{Pn} is for the opportunity cost of the commodities' prices P_n; α, β are the interest and risk factors respectively of the opportunity cost; M is for the final price of auction items, which the seller can accept. This model is about a general model on the auction merchandise pricing decisions of online auctions, and through solving this model, it can achieve the reserve price r of pricing decisions to maximize satisfaction the auction transaction revenue, which can be solved specifically through the following method.

The analysis of historical data and experimental method can determine the customer valuation distribution function F(V). Firstly, under the initial valuation $[q, V_n]$, all potential bidders may reach the expectations price $P_n(r)$ when the auction time T arrives. As the network proxy mechanisms exist, Bidders would bid his true valuation. But the network showed the rate ε is a rise, so the final transaction price is not the highest price of the auction bidders who are willing to pay for goods. To facilitate the calculation, the bidder of the auction items were valued as the smallest divisible number of the rate ε. All potential bidders by making products people are willing to pay the highest price $\{0, \varepsilon, 2\varepsilon, ..., q, q+\varepsilon, q+2\varepsilon, ..., r, r+\varepsilon, ...V_n\}$. Therefore, the last possible auction price is a collection of discrete random variables $\{r, r+\varepsilon, ...V_n\}$, $i \in [0, k^*]$ and $k^* = \frac{V_N - r}{\varepsilon}$. And then it can get the final transaction price P_{ri} according to customer valuation distribution function F(V). Using the all expect formula, if the seller determined the starting price q and $P_n(r)$ based on the reserve price r, combined with the seller and the real risk-bearing capacity of the bidder's psychoanalysis, the bidder will choose the right pricing strategies, such as the mantissa pricing strategies, and determine the final reserve price and the expectations of the price of auction items. When the two sides finished the transaction, the customers can give advice and evaluation on the open Web platform, which can also maintain their transaction

security, but also provide a reference to the future of consumer transaction basis.

In this model, the auction ending time T is for the end time of the auction, but in the actual situation, the auction process can end at any one time T_n for analysis, and reach the decision-making moment for meeting the sellers' satisfaction, thus end online auction process at ahead. Therefore, in the practical implementation of the pricing decision-making process, decision-makers need to make further adjustments to adapt to the changes in online auctions progress. For the consumers, at this time, the time efficiency of auction transaction is greatly enhanced, reducing the opportunity costs of both sides, making the buyer's expected surplus as zero. The reserve price of goods and auction items' prices at this time not only reached the revenue maximization, but also improve the efficiency of the entire auction, which can be said to be a win-win strategy for the auction.

V. CONCLUSIONS

In conclusion, firstly, online auction operators need to maintain a good reputation. The purchase price, current bid and the seller's rating presented interactions. When the seller operators maintained a good evaluation, the direct changes in the level of the purchase price will also affect the willingness of consumers the bid price level. However, if the sellers have a negative evaluation, the product was not so easy to attract consumers to bid to buy. Thus, consumers gave the sellers' evaluation, which is a very important resource, so online auctions operators need to maintain a good evaluation scores properly. Secondly, solving the credit problem can reduce risk of online auction environment, addressing information privacy, integrity, and non-repudiation, even identification, as well as the security in the logistics and payment processes. China is going the construction of the smart ID card to establish security authentication mechanism, which will has played a certain role to reduce the risk of online auctions. Bidders for the specific attitude towards risk of the auction items reflected in the valuation of the degree, the less tolerance for risk, the lower the valuation of goods for auction. On the contrary, the greater the customers' tolerance for risk is, the valuation of goods for auction is closer to the original valuation. But for the sellers' specific attitude towards risk, if their tolerance for risk is greater, the set reserve price will be lower. The consumers have different buying behavior according to the different sources of information. Nowadays, the information of online auctions provided is very rich, so how to select useful information is a key factor for consumers. There are too many risks and uncertainties coupled with online auctions, so the relationship of trust between people is the most basic consideration. If the sellers were able to provide the best products and services, as well as produce the best service reputation, they will be able to improve their competitiveness, and at the same time, consumers will also increase confidence and attitudes in order to enhance the buying opportunity for higher benefits.

In China, the construction of smart ID card are establishing, and the security authentication mechanism in Certification Center will reduce the risk of online auctions auction merchandise and play a certain role. The specific attitude of bidders towards risk of the auction items can be reflected in the valuation of the degree, the less tolerance for risk, the lower the valuation of goods for auction. On the contrary, if the tolerance for risk is greater, the valuation of goods for auction will be closer to the original valuation. The specific attitude of sellers towards the risk can be reflected in the reserve price. If the sellers have greater tolerance for risk in the similar objectives agreed under the premise of the auction, the set reserve price will be lower. And on the contrary, if the tolerance for risk of seller is smaller, the set reserve price will be higher. For the different sources of information, consumers have different buying behavior. Nowadays the information of the online auctions present is very rich, so how to select useful information out to consumers is a key factor. And then, there are too many risks and uncertainties, the relationship of trust between people are the most basic consideration. If the seller were able to provide the best products and services to produce, the best service reputation will be able to improve their competitiveness, and consumers will also increase confidence and attitudes in order to enhance the buying opportunity for mutual access to higher benefits. An auction mechanism involves two parts, the allocation rules and the pay rules. The distribution rules in the standard auction are the same, namely, the highest bidder will be successful, while the payment rules are changing, but the change of the payment rules in the model under the assumption does not affect the expectations of the auction bidders expected earnings and expenditures, the impact is bidders equilibrium bidding strategy. Lastly, an auction mechanism contains two parts, the location rules and paying rules governing. Distribution rules in the standard auction are the same, while the payment rules are changing. But the change of the payment rules does not affect the expected earnings and expenditures of the auction bidders, but bidders' equilibrium bidding strategy.

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