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An Exploratory Analysis of Public Resource Online Auctions

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An Exploratory Analysis of Public Resource Online Auctions

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An Exploratory Analysis of Public Resource Online Auctions

Executive Summary

The purpose of this study is to provide an exploratory analysis of public resources' allocation through online auctions. Online auctions are new ways of public resource allocation in China, but they are promising because of its broad participation and low transaction costs. In addition, compared to traditional administrative allocation mechanisms, auction methods could resolve the rent-seeking problem. One important point for an online auction is to design a certain set of rules to attract the targeted people to realize the rule-maker's goal. But why can a certain set of rules affect the participants' actions? To answer this question, it is necessary to analyze the essence of human nature, because actions are instructed by ideas, while ideals are determined by human nature.

What is the essential characteristic of men? It is greed. Once a man comes to the world, he wants to maintain his life, and then greed appears. In addition, human nature is alterable. Therefore, participants' actions instructed by ideas are alterable. This is the meaning of designing different auction rules. Moreover, different rules of auctions are determined by different auction goals. Because public resources are natural monopoly, specialty assets shared by the public and have long time usage, the government should design a mechanism to find the maximum value of the resources and to allocate them to the bidder who has the biggest probability to realize his or her value. Here the maximum value of resources involves not only efficiency, but also equity due to its "public" characteristic. Open ascending auction is relatively a good method of allocation because it provides bidders with more information, in terms of efficiency and equity.

In conclusion, since public resources are owned by the citizens, its allocation should help the public to make a profit. But nowadays, many government agencies have sold public resources to make their own profits by sacrificing the public's interests. These actions have the tendency of making governments to deviate from their missions. To ensure that the general public will earn some profits, when designing auction rules, three questions must be answered: what is the goal of the auction? What rules should be designed to realize the goal? Who is to empower the auctioneer to auction? Only after these questions are clearly answered, can any auction by a public entity be successful.

An Exploratory Analysis of Public Resource Online Auctions

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An Exploratory Analysis of Public Resource Online Auctions

1 Introduction

Huge changes have occurred in every field during the thirty years of opening to the outside world in China. As an important way of resource allocation, online auctions are and will be more and more applied in the public resource distribution field of governments in China, such as treasury bills, radio spectrum licenses, mineral rights, special permission power of operation, distribution of important national scientific research funds, and so on. But the generalization and application of this method is restricted in a way because of the deficiency of both theoretical research and practice in China.

In this field, one of the public policies, which are valued by the government and should be dealt with immediately in China, is how to design an optimal mechanism and formula of online auctions so as to allocate public resources in an open, transparent, and efficient way. But nowadays, the research on online auctions is seldom seen in China. At the same time, there are some new theoretical issues which need to be explained with the practice of online auctions in the specific circumstance in China. In fact, there are many studies on auction, but there are not any specific theoretical studies on online auctions. Therefore, it is a challenging topic both in theoretical and practical fields.

2 Literature Review

2.1 Vickrey's Inaugural Contribution

William Vickrey's paper "Counterspeculation, auctions, and competitive sealed tenders" in 1961 is the first treatment of auction theory. In the paper, he used game theory to analyze the auction issues, and made enormous progress in putting forward

some key issues in auction theory to induct the basic research methods in this theory. He analyzed simple auctions first in which there is a single unique indivisible object to be sold. By analysis, he demonstrated that whether the bidders are symmetrical or not, the dominant strategy for each bidder, in the ascending auctions, is to keep bidding until the current price equals to his value. At last, the bidder whose value is the highest wins the object at the price approximately equal to the second highest value. “This result is obviously Pareto-optimal” (Vickrey, 1961, 14). In the descending auctions, if the bidders are symmetrical, the price each bidder announces should be lower than his actual values. Finally, the bidder whose value is the highest will win. Thus, this result is also Pareto-optimal. But if the bidders are asymmetrical, the result of the descending auctions is likely to be inefficient.

In addition, Vickrey (1961) also found that the descending auction is the same to the first-price sealed-bid auction in the strategies, because the situations the bidders consider in these two auctions are the same. What about the ascending auction? Vickrey (1961) proposed a kind of auction, the same to the ascending auction in strategies: the second-price sealed-bid auction, also called the Vickrey auction. An important characteristic of this auction is that the dominant strategy of each bidder is speaking out his actual value or “telling the truth.” Because the object is won by the bidder whose value is the highest, the result is Pareto-optimal.

Another important contribution is that he proved that the average revenues in both the ascending auctions and the descending auctions are the same if the bidders are symmetrical. Based on the former analysis that the descending auction is the same to the first-price sealed-bid auction in the strategies, and the ascending auction is the same to the second-price sealed-bid auction in the strategies, the result means that the average revenue the four kinds of auctions bring is equivalent. This is the

revenue equivalence theorem (RET). At the same time, Vickrey (1961) found that the revenue variance in the descending auctions is lower than in the ascending auctions. Thus, risk-averse sellers prefer the former one. And he pointed out that collusion may be a fatal disadvantage in the sealed-bid auctions.

In 1962, Vickrey extended his theory from single object auctions to multiunit auctions. He analyzed simultaneous auctions and sequential auctions in the case that each bidder could buy one unit at most. In fact, Vickrey's 1961 and 1962 papers were the main factors in his 1996 Nobel Prize (Klemperer, 1999).

2.2 The General Auction Theory

2.2.1 The Four Standard Types of Auctions

(1) The definition of the four standard types of auctions

Usually, for simplicity, it is easier to consider the situation that only a single indivisible object is to be allocated. According to Vickrey's opinion (1961), there are four basic types of auctions: the ascending-bid auction (also called the English auction), the descending-bid auction (also called the Dutch auction), the first-price sealed-bid auction, and the second-price sealed-bid auction.

In the ascending-bid auction, the auctioneer announces a low price, and then the bidders do not stop to announce their prices in a progressive way until only one bidder remains, and that bidder wins the object at the final price. In the descending-bid auction, in which the process is opposite to the ascending-bid auction, the auctioneer announces a very high price, and then he does not stop to announce prices in descending sequence until someone calls out that he or she will accept the current price. And that first bidder wins the object at that price. In the first-price sealed-bid auction, every bidder submits his or her own price without knowing others' bids, and the bidder who gives the highest price wins the object at that price.

In the second-price sealed-bid auction, the same process as the first-price sealed-bid auction, every bidder submits his or her own price without knowing others' bids, and the bidder who gives the highest price wins the object. But in this auction, the winner pays the object at the second-highest bidder's price, not the highest price he gives. That is to say, in the first-price sealed-bid auction, the price the winner pays is the highest price or "first" price, but in the second-price sealed-bid auction, the price the winner pays is the second-highest bidder's price or "second price."

All the four types of auctions have the same hypothesis that the auctioneer and the bidder are rational economic men and selfish. This is a theoretical assumption, however, which may not be compatible with the reality. Idea affects behavior. And human nature affects the auction behavior. The paper will analyze this issue in detail in the following section. At present, one point to mention is that human nature is greedy originally and changes according to different situations (Fangfu, 2007).

(2) The ascending-bid auction and the second-price sealed-bid auction

In the ascending-bid auctions, during the bidding process, it is beneficial for the bidder to stay in the bidding until the price reaches his or her value (Milgrom and Weber, 1982). For example, if one bidder thinks that the object is worth x dollars, and now another bidder's price is less than x dollars, it is beneficial for him or her to announce a higher price than that bidder's price. However, if another bidder's price is more than x dollars, it is good for him or her to stop bidding. So in this kind of auction, the dominant strategy for a bidder is that he or she does not stop bidding until the current price equals his actual value. Thus, the bidder who has the highest value will win the object.

For the price, when the bidder who has the highest value announces the price equal to the value of the second-highest bidder, all the bidders stop to bid again, or they will have a loss, because the price is more than their value. So here, the bidder with the

highest value will win the object at the price equal to the value of the second-highest bidder.

In the second-price sealed-bid auctions, the result is the same as the ascending auction. Similarly, if a bidder thinks the object is worth x dollars, while other bidders' highest value is y dollars, and if that bidder submitted his price z , which is lower than the actual value x dollars, now there are three possibilities: (1) if x is lower than y , there is no difference to submit z or x ; (2) if x is higher than y , and his price is higher than y , he will win the object at the price y , the same result as submitting x ; (3) if x is higher than y , but his price is lower than y , then he will lose the chance to win. In the opposite situation that the bidder submitted his price higher than the actual value, it is the same way to verify the result is the same. Generally speaking, it is the best way to submit the actual value (Tan, 2001, 7-8).

It can be clearly seen that in both the two kinds of auctions, the dominant strategy for the bidder is telling the actual value or "telling the truth," and the winner will win the object at the price equal to the value of the second-highest bidder.

(3) The descending-bid auction and the first-price sealed-bid auction

In the descending-bid auction, if the current price is one bidder's actual value, it is beneficial for him to accept it, or he may lose the chance to win. So the winner with the highest value will win the object at his value.

As for the first-price sealed-bid auction, if the bidder does not tell the truth, the result is the same as the above analysis of the second-price sealed-bid auction. Thus, the dominant strategy is telling the truth, and the winner will get the object at his value (Vickrey, 1961; Milgrom and Weber, 1982). In a word, the results of these two kinds of auctions are the same.

2.2.2 The Basic Models of Auctions

Based on different personal preferences and whether the information is perfect or not, there are three different basic models of auctions: the basic private-value model, the pure common-value model, and the general model (Klemperer, 1999).

In the basic private-value model, each bidder has a special preference for the object, and his preference is not affected by others' preferences. That is to say, each bidder's price is a private price, and he gives the price just based on his own value.

In the pure common-value model, each bidder has the same preference for the object, so the actual value is the same for everyone. But before knowing the actual value, each bidder has different private information about what that value actually is. Therefore, the bidder who has more information has bigger probability to win the object. And each bidder may change his estimate of the value if he knew another bidder's information. In this kind of auction, a key feature of bidding is the winner's curse. The winner may pay more than the object is worth when failing to differentiate the news being good or bad. So each bidder must know that he wins the object only when he has the highest signal.

These two models are two extremes. Reality encompasses both these two occasions that each bidder has their own preference and information, so they have their personal value, but at the same time, each bidder's value depends on others' information because this affects the resale value and the prestige of owning it. This situation is the general model.

2.2.3 Revenue Equivalence Theorem (RET)

The analysis of the auction revenue usually starts with the benchmark model containing the following assumptions: (1) there is a single object to be sold; (2) all the buyers are risk-neutral; (3) all the buyers are symmetrical; (4) each buyer has

independent private information, and he would not change his value even knowing others' signals; (5) the relationship among the buyers is non-cooperative games (Milgrom and Weber, 1982).

As demonstrated before, Vickrey showed that the expected revenue of all the standard auctions, the ascending auctions, the descending auctions, the first-price sealed-bid auctions, and the second-price sealed-bid auction is the same, which is called revenue equivalence theorem (RET). Thus, whatever auction the seller chooses is not important.

Myerson (1981) and Riley and Samuelson (1981) proved that the equivalence of expected revenue in the standard auctions could be generalized to other situations. For example, if combining the first-price auctions and the second-price auctions and assuming the bidder who gives the highest price wins at the price equal to half of the highest price plus half of the second-highest price, the average revenue is the same as in the standard auctions.

2.2.4 Relaxing Some Assumptions of the Benchmark Model

(1) Risk aversion

The RET above is based on the assumption that the bidders are risk-neutral.

But if the bidders are risk-averse, what is the result? Then, in the second-price auctions or the ascending auctions, the dominant strategy for the bidders is still telling the truth. But in the first-price auctions, a slightly higher price increases his probability to win, at the cost of slightly reducing the value. So in this situation, the bidder may bid aggressively to make sure he is winning and get the benefits, which could increase the seller's revenues. Therefore, the seller prefers the first-price auctions to the second-price auctions when facing risk-averse bidders. And the RET does not exist either (Klemperer, 1999). But the difficulty is how to differentiate the bidders that are

risk-neutral or risk-averse.

(2) Affiliated value

In this situation, each bidder has their own preference and information, so they have their personal value, but at the same time, each bidder's value depends on others' information. In the ascending auction, the process is open, which can give a signal to others that means the winner's curse could be avoided strongly, and the bidders have greater incentive to bid. So if there is affiliated value, the ascending auction has a revenue advantage (Milgrom and Weber, 1982).

(3) Asymmetries

Myerson (1981) verified that the optimal choice for the seller is to sell the object to the bidder whose marginal revenue is the highest rather than the bidder whose private value is the highest. And the seller even sets different reserve prices for the bidders. For example, in China, when the government decides to sell an object, and the bidders include domestic companies and foreign companies, foreign companies are comparatively effective because they have lower technical cost. Therefore, the government may give some special policies to domestic companies to improve their competition ability.

And if the buyers are asymmetrical, which kind of auction is beneficial to the seller? If each bidder's price is a personal price, and will not be affected by others' price, in the ascending auctions and the second-price sealed-bid auctions, the dominant strategy for the bidder is still to tell the truth. In the first-price sealed-bid auctions, however, "the bidder whose value is drawn from a weaker distribution bids more aggressively than the bidder from a stronger distribution" (Klemperer, 1999, 236). Thus, for the seller, the first-price sealed-bid auction is better than the ascending auctions or the second-price sealed-bid auctions. But generally it is difficult to compare, and this is

still a task to be resolved.

2.2.5 Collusion

(1) Collusion among bidders

If some of the bidders, even all the bidders, agree to set prices to reduce the competition, this is collusion. For example, all the bidders agree to give a low price and let one win the object, then after the auction or before the auction, all of them share the benefits.

Robinson (1985) makes a point that a collusive agreement may be easier to sustain in an ascending auction than in a first-price auction. And this result gives an explanation why the first-price sealed-bid auction is popular. Assuming, all the bidders agree to designate one bidder to win, in the ascending auctions, the agreement is that all the other bidders do not set higher prices once the designated winner announces a price. And in this situation, no one would violate the agreement, because the designated winner could announce an even higher price to attack the violator. In the second-price auction, the agreement is that the designated winner will give an infinitely high price, but all the other bidders give the price equal to the seller's reserve price. Under such conditions, similarly, nobody has an incentive to violate the agreement, because if anyone violates the agreement to give an even higher price than the designated winner's price to win the object, he will pay the object at the designated winner's price, which is infinitely high. Even though he wins the object, the price is so high that it exceeds his actual value and it is not worthy to violate the agreement. But if in the first-price auction, the designated winner could not give an infinitely high price, or he will win the object at that price. The rational choice for the agreement is that the designated winner gives a price just a little exceeding the seller's reserve price, and the other bidders give the price equal to the seller's reserve price. Here, in contrast to the second-price auction,

someone may violate the agreement, because he will win the object as long as he gives a price a little higher than the designated winner's price, which is just a little exceeding the seller's reserve price. That is to say, unlike the second-price auction, in which the price the winner has to pay is indefinitely high, here, the price is not very high (Robinson, 1985; Klemperer, 1999).

Certainly, the seller could design some devices to reduce the opportunity of collusion: First, the seller should increase the reserve price; second, the seller should use a secret reserve price- that is, specify a reserve price in advance but not reveal it to the bidders until after the auction (Tan, 2001). If the highest price does not exceed the reserve price, then the object will not be sold. But an important problem is that it is difficult to detect collusion.

(2) Collusion between auctioneer and bidder

Vickrey (1961) pointed out that if the seller is the government or a big organization, the auctioneer has no incentive to maintain the seller's interests, especially in the sealed-bid auctions. For example, in the first-price sealed-bid auction, after all the bids were submitted, the auctioneer tells the highest-price bidder the second-highest price, and allows him to submit a new price a little higher than the second-highest price to get a bribe (Boehm and Olaya, 2006).

(3) Collusion between auctioneer and seller

In the second-price sealed-bid auction, a "shill" may be used to jack the price up (Vickrey, 1961). For example, after all bids are given, the auctioneer may tell the seller the top bid, and the seller submits a new bid just under the top bid by himself or asks his friend to do likewise to make the top bidder pay more.

2.2.6 Multiunit Auctions

(1) Same multiunit auctions

In the same multiunit auctions, there are k same objects with n buyers, and $n > k$. And it usually supposes that each buyer only needs to buy one object. There are two ways to auction those same objects: simultaneous auction, in which all the objects are auctioned at the same time, and sequential auction, in which the object is auctioned one by one (Vickrey, 1961, 24).

For the simultaneous auction, there are often two ways to determine the winner's price: discriminatory price, in which each bidder submits a bid independently, and k highest-price buyers win at their own price, and uniform price, in which k highest-price buyers win, but the price is equal to the $(k+1)$ highest-price (Vickrey, 1961).

In the symmetrical independent private value model, if the bidders are risk neutral, the RET can be applied to the discriminatory price and uniform price models. RET also can be applied to the sequential auctions. In the symmetrical independent private value model, if the bidders are risk neutral, each object's expected price is the same, not affected by the sequence (Tan, 2001). But in the common value model, the expected prices are different, because the announcement of the former price provides information to the following auctions (Milgrom and Weber, 1982).

(2) Different multiunit auctions

About this issue, the research has not been mature until now. And it needs to be studied further.

2.3 The Auction Online Theories

2.3.1 The Choice of Auction Formats

In the benchmark model, the expected revenue is the same in the four standard auction formats, and the seller could choose any one of them. But in reality, the assumptions in the benchmark model cannot be satisfied completely. Therefore, the expected revenues in the four auction formats are different.

Lucking-Reiley (1999) did a spot experiment to the RET. By the experiment, the result is that the average revenue in the descending auction is 30 percent higher than in the first-price sealed-bid auction site. But the average revenue in the ascending auction is almost the same as in the second-price sealed-bid auction (Lucking-Reiley, 1999, 1078). How to explain the result? One explanation is that the spot experiment cannot control the entry of bidders. In this experiment, the number of the bidders in the descending auction is nearly twice as many as in the first-price sealed-bid auction, so the increase of the bidders could result in the increase of the seller's revenue.

In reality, when a person observes the main three online auction sites eBay, Yahoo and Amazon, he could find that all three adopt the ascending auction. And Lucking-Reiley (2000, 237) found that of the 142 sites, 121 used the ascending auction, 21 used the sealed-bid auction, and 3 used the descending auction. Six of the sites used more than one auction format, which is the reason why the sum is more than 142. Why is the ascending auction so popular in the online auctions? According to Lucking-Reiley's explanation, when the people first hear the word "auction," they think it is ascending auction. Therefore, ascending auction is prevalent now. The second reason is because most of the online auctions belong to the common model. And for the common model, the result given by Milgrom and Weber (1982) is that the expected revenue in the ascending auction is higher than in other auction formats, because in the ascending auction, the bidders do not worry about the winner's curse issue, and they will not conceal their bid. But it does not mean that the surplus the bidder gets in the ascending auction is lower than in the other auction formats. Therefore, adopting ascending auction is beneficial for the three participants: the seller gets higher revenues, the buyer could avoid the winner's curse issue, and the auction site could get higher fees.

2.3.2 The Reserve Price of the Seller

Many eBay sellers, especially those selling high-value objects, often set secret reserve prices. When will the seller use a secret reserve price? Bajari and Hortacsu (2003) found that sellers tend to use the secret reserve price when the objects are high-value.

Vincent (1995) showed that setting a secret reserve price can increase the seller's revenue in a common value auction. But Katkar and Reiley (2002) thought that some sellers adopt secret reserve prices for other reasons not increasing their expected auction prices: by making a high secret reserve price, the sellers could find out the highest-price bidder, and then they could make a transaction beyond the auction site to save the auctioneer fees. By contrast, through a field experiment, they found that using secret reserve prices may discourage serious bidders from entering the bidding, and reduce the sale probability and decrease the sellers' revenue. Bajari and Hortacsu (2003) gave an additional cost using a secret reserve price: for some bidders, especially those participating in an auction for the first time, they do not understand the auction online rules, and if they do not win the object because of the secret reserve price, they will be angry with the result. Then they may give negative comments to the seller in the comment column.

2.3.3 Bidding Strategies

One of the strategies the bidders usually use is "sniping," or "waiting until the final minute of the auction to submit a bid" (Lucking-Reiley, 2000, 238). Ockenfels and Roth (2002, 1099) found that of 240 antique-auctions, there were 89 auctions in which the bidders submitted bids in the final one minute, and there were 29 auctions in which the bidders submitted bids in the final 10 seconds.

The first explanation is that there are some experience-inadequate bidders or some

first-time auction bidders. They do not know the auction rules, and they increase their bid continually to compete with others. But for the rational bidders, the best way to compete with those bidders is to submit bids just before the auction ends. The second explanation is that giving an early bid may reveal information to the rivals if the auction closes at a fixed time, which serves no benefit to the bidder.

The third explanation is based on the common value model. In the common value model auctions, the object has a real value, which cannot be observed directly by the bidders. But every bidder has their own private information. In the beginning of the auction, the bidders could renew his value according to others' information. So to keep the information personal, the strategy is giving bids at the final minute.

2.3.4 Fraud

Except for having no opportunity to look over the object, another issue is the possibility of fraud. The first type of fraud is that the seller does not mail the goods or mails goods of lower quality than bid upon after the buyer pays. Usually the standard procedure for the buyer is to pay first, and then the seller mails the goods. But how does the buyer know whether the seller mails the goods or not? (Snyder, 2000; Gavish and Tucci, 2006) Besides, the repeated transactions between the seller and the buyer are very few, lower than 20 percent during 5 months in eBay (Resnick and Zeckhauser, 2002, 9). This limits the buyer's from getting the information about the seller's honesty and reliability.

To resolve the problem, three mechanisms are used to discourage fraud. The first mechanism is that some auction sites encourage defrauded buyers to give complaints to the courts. The second mechanism is that eBay developed a feedback and rating system to encourage buyers and sellers to rate each other after a transaction. And it opens the results to the public. So every potential buyer could know the seller's credit standing.

This is especially important for transactions involving expensive objects. If there is just a little feedback for the seller, the buyer is reluctant to buy an object with thousands of dollars. The third mechanism is that some auction sites encourage the buyers to use a third-party escrow service. The buyer sends money to an escrow agent first, and the agent verifies receipt to the seller. Then the seller mails the good. After the buyer gets the goods and confirms it meets his expectations, the agent gives the money to the seller (Lucking-Reiley, 2000; Snyder, 2000; Resnick and Zeckhauser, 2002). But unfortunately, in some cases checked by Gavish and Tucci (2006), the escrow company did not exist at all, but was set up by the sellers.

The second type of fraud is that sometimes the sellers use some strategies to drive up the price of the goods (Lucking-Reiley, 2000; Snyder, 2000). For example, during the process of the auction, the sellers themselves submit bids on their own goods or get their friends to bid on their behalf or even just invent a false identity with a new email address to bid on their own goods. These phenomena have been reported in traditional ascending auctions for many years. And most auctioneers do not allow the sellers to do so, but it is difficult to detect because the bidders cannot see each other.

The third type of fraud, inversely, is that some buyers may use some strategies to reduce the price of the goods (Lucking-Reiley, 2000; Snyder, 2000). For example, at the beginning, one bidder makes a low bid, and then he asks his friend or just uses a false identity to make an infinitely high bid on the same object to keep others out of the auction. Finally, just at the final minute of the auction, the bidder retracts the high bid and leaves the low bid to win.

3 Methodology

In the existing literature, the research methods mainly include economics, game

theory, mathematics, and statistics. The literature made significant results. However, most of these results focus on designing specific auction rules and analyzing the behavioral strategies of bidders. Because of realistic circumstances' diversity, such results are infinite theoretically, which may confuse people and could not resolve issues concerning public resources online auctions.

Public resources are owned by the general public, so it involves public administration. At the same time, allocation of public resources involves efficiency and effectiveness, which is the main topic of economics. In this paper, the author tries to use a different research method, which is the setting-based research method, by integrating public administration, economics, and Chunghwa Taijics theory (the special study about Chinese traditional culture, ideas, and philosophies) based on the particularities of public resources.

Chunghwa Taijics stated that all truths exist and all existences are setting-based, which means they exist in certain settings. At the same time, settings are changeable (Fangfu, 1996, 18). According to these ideas, the author puts forward a setting-based research method. The details are as follows:

First, an issue should be clearly defined. Usually, people are fuzzy about definition of one issue. During the beginning phase of research, people should clearly know what the essence of an issue is, why the issue comes into being, what the settings of the issue are, and so on. Actually, in many situations, if one issue can be defined clearly, answers to the issue appear naturally.

Second, certain standards should be established. Whatever definitions of issues or final solutions, there should be a clear judgment standard. For example, when people judge whether an auction is efficient or not, using different standards may lead to different conclusions.

Third, settings should be analyzed. About different issues, different resolutions, and different standards, what are the settings in which they are true? By analyzing the settings, people can state some principles to instruct practice. Then, in reality, people could apply these principles in a flexible way in different situations.

The function of one theory or an analytical framework is to enlighten and open people's minds, not to make them follow the theory or framework mechanically. Theories and practice are two different settings.

In this paper, the author does not analyze the specific technical details and specific areas, such as designing auction rules for a specific object or mathematical analysis about bidders' behavioral strategies in specific auction rules. The author tries to use an essence-finding research method to analyze the essence of public resources online auctions, to which government and the public pay most attention. In addition, except for general logic analytical methods, two case studies also are included in this paper.

4 Findings

4.1 Analysis of Auction Rules and Auction Participants' behaviors

An auction is to decide the price and the way of allocation of the object according to the participants' value and a special set of rules. The most important thing in an auction is to design the auction rules (Chen, Chen and Song, 2005).

The participants adopt different strategies according to different auction rules. But how could the auction rules affect the participants' strategies? And then what is the essential factor of the auction rules? How does one decide whether a set of auction rules are good or not? What is the criterion? The answers to this fundamental question are seldom in the literature, and it is always considered a precondition.

To answer the question, it is necessary to analyze human nature. Ideas affect

people's behavior, while people's basic ideas are determined by their human nature (Fangfu, 2007).

Human nature means the essential character of people. People have many characteristics, and all the characteristics are alterable in different times and different places. But every change cannot deviate from the essential characteristic of men.

Overall, in the western theory school, assumptions of human nature went through "economic man" to subsequent "social man," "self-actualizing man," and "complex man." The "economic man," also called rational economic man, means the purpose of all of the person's behaviors is to maximize his personal interest, and he works only for money (MBAlibLink, 2009a).

As for the "social man," from 1927 to 1932, George Elton Mayo hosted the famous Hawthorne experiment. The results of the experiment revealed that except for the need of material benefits, men also have the need of communicating with others. All men are not independent, but are members of an organization. The relationship among the persons and the affiliation of the organization are even more important for motivating men's behavior (MBAlibLink, 2009b).

In the late 1950s, Abraham Maslow proposed the conception "self-actualizing man." This hypothesis states that men are naturally lazy. And only when a man's potential is encouraged and exerted fully can the man feel satisfied. The reason why men cannot be self-actualized is the limitation of the environment (Chen, 2008; MBAlibLink, 2009c).

But the theoretical basis of "self-actualizing man" is wrong. Men are neither naturally lazy nor naturally diligent. In addition, the development of men is not a natural process.

The meaning of the "complex man," which was proposed by Schein in the late

1960s, includes two aspects: first, in terms of an individual, the private need and potential will change with growing age, increasing knowledge, shifting status, changing circumstances, and the relationship among persons; second, in terms of the person in a group, each man is different. Therefore, no matter whether the “economic man,” “social man” or “self-actualizing man,” each has its right side, but cannot apply to all men (MBAlibLink, 2009d).

The basic limitation of these theories, from the material benefit pursuing of “economic man,” communication need of “social man,” relying on the environment of “self-actualizing man,” to the hypothesis of “complex man,” that the need of a man is alterable and every man is different, is that they just describe the behavior phenomenon of human nature under certain circumstances, but they do not analyze the reasons for the behavior phenomenon of human nature. For example, the hypothesis of “complex man,” just discusses the phenomenon that the need of a man is alterable, but it does not analyze why the need of a man is alterable. Phenomena change all the time and it is impossible to finish describing all the phenomena. To resolve this problem, the fundamental way is to analyze the essential character of human nature (Chen, 2008).

Just as mentioned before, in this paper, the author thinks that greed is the essential and original character of human nature. All men cherish life. After coming into the world, man has life. Once alive, man will cherish his life, which is the nature of human being. In China, there is a proverb that “ants even treasure life, let alone men.” No one wants to give up his life naturally. Taking the infant as an example, once he has life, he wants to eat. If not, he will cry. And when the mother breastfeeds him, he sucks naturally without his parents’ instruction (Fangfu, 2007).

The natural character of sustaining life leads to the first desire of humans. In Chinese traditional culture, the existence of one’s life is sustained by eating other lives,

because all the existence in the world, including the animals and plants, and even water, air, and so on, have life. In order to sustain life, the basic need is there being some food to eat. The need for eating, which is an inherent characteristic of men, becomes the first desire of men, and it is also the origin of men's other desires. That is to say, as long as you are a person, you cannot be an exception.

The key issue is that once the desire comes into being, it is impossible for the desire to be met completely. There is always a gap between the ideal need and the realistic supply of the desire. Once the desire appears, it is determined that the need of the desire is infinite. Even if one's desire is met, another desire comes up. The desire at this time in this place is met, but a new desire comes up at a new time in a new place. It cannot be ended until the end of life. The theory of Maslow's hierarchy of needs also demonstrates that another need will come up with one need being met (Fangfu, 2007).

For example, to satisfy the need of eating, man must find some food. However, not all the food man wants can be received. In a poor family, when the child finds some food which looks very delicious while watching television and he has not eaten before, he wants to eat it very much. But his family is so poor that his parents cannot afford the food now. Thus his desire of getting the food comes up. On the one hand, if his desire is very strong but is not met all the time, he may develop behaviors that harm others; if so, evil comes into being. On the other hand, suppose his desire is met one day, but on the other day, when he sees someone eating some food he has not eaten before, he wants to eat again. So when an individual's need is met, at a new environment, another need appears. The desire is infinite. If one's desire cannot be satisfied completely forever, greed comes up.

Greed, representing a willing that one man always wants more, was produced in the situation that the gap between demand and supply makes one's need unable to be

satisfied. Just as analyzed before, the gap between demand and supply cannot be eliminated. Thus greed is a common characteristic of human beings. Greed is a strong desire in the mind, but not a behavior. Whether it can become an action depends on different circumstances.

Idea leads to action. The action instructed by greed may cause harm to others under certain circumstances. Harm is an actual action caused by greed. And evil is a subjective assessment of harm. It is necessary to point out that the arising of harm need to meet some conditions, just as the taking root, sprouting, and growing up of one seed need soil moisture, air, sunlight and so on. If the conditions are not right, harmful behavior cannot come into being. Conversely, the behavior instructed by greed may change into good behavior. Pursuing personal interest can improve social welfare as a whole in a free market-based economic system, here the key problem being mechanism and conditions.

Men hate and fear evil, so they call for considering public interest and advocate goodness. Goodness, which comes up as opposed to evil, is not the essential characteristic of human nature. It comes from evil.

Whether harm, evil, goodness, or considering public interest, all these actions constitute human beings' understanding and assessment of their behaviors. Thus, this understanding forms under certain circumstances in the society. The origin of bad behavior or good behavior is greed (Fangfu, 2007).

In conclusion, the essential characteristic of the human nature is greed, while goodness comes from evil under certain circumstances. At the same time, human nature changes in different situations, and exhibits different characteristics. In addition, men have the ability to adapt to a new environment automatically. Just as the four auction mechanisms, the participants can take different strategies when facing different auction

mechanisms.

Human nature determines men's ideas and instructs behaviors. Since human nature changes in different settings, the behaviors caused by human nature also change in different settings. Therefore, when it comes to the special case of auctions, the essence of auction rules is to create certain settings to attract potential participants to come to the settings.

The auction rules must answer the following questions: Will the highest bidder win the object? If not, what conditions must the auction meet? Does every bidder know other bidders? How do you decide the price the winner should pay? Should every bidder pay a certain fee?

There are not uniform criteria to judge an auction rule being good or bad. Here, the key issues are the angle of treating the issue and the auction purpose. That is to say, there are different situations: maybe if I view it from the management angle, it is good; but if I change to view it from the economic angle, it is not good.

4.2 The Puzzle of Allocating the Right to Use Public Resource and the Auction System

As an administrative object of government, "public resources" is a comprehensive concept including broad contents and complicated components, which mainly involves social resources, natural resources, and administrative resources. Social resources are the resources in the public utility field, such as the franchises of water supply, gas supply, telecommunication, and so on. Natural resources include land, mineral resources, water area, and so on. Administrative resources are the resources deriving from government carrying out the function of supplying public services, such as outdoor advertisements, bus lines, and so on.

The main characteristics of public resources include they are owned by the whole

society; government can represent the public to have the right of disposal; services supplied by public resources can be shared by the public and managed because they are natural monopolies. Also, they are of long-term usage and are specialty assets, which means the funds put into the public resources cannot be used for other purposes.

Because public resources are natural monopolies, most of the products of the natural monopolizing industries are pure or quasi-pure public goods, and the key inputs they use also have similar characteristics, such as telecommunication frequency, airports, hands-free telephone networks, and so on. In a way, the right to use the inputs is a prerequisite of monopolization. From the social benefit, it is important not only to regulate the products and prices of these industries, but also to interfere in the allocation of the rare resources.

4.2.1 The Traditional Way of Allocating the Right for Public Resources

(1) The externality of using the right of public resources and its allocation puzzle

As demonstrated before, public resources are natural monopolies, while most of the products of the natural monopolizing industries are pure or quasi-pure public goods, and public goods are of externality, so the public resources have the characteristic of externality. How can the problem be resolved? Economists suggest privatization, nationalization, and governmental regulation to resolve overage or deficiency supply issues caused by the gap between private marginal costs and social marginal costs when using public goods, especially public goods with strong externality. In terms of privatization, it could completely resolve the externality brought by property right arrangements. But because of problems that arise from transaction costs, difficulties to define the property rights of the public resources, it could only be effectively used in the allocation of public resources which can be divided technically, whereas it is inefficient to allocate the resources, such as oceans, frequency, roads, and so on. In terms of

nationalization, it can partly reduce the transaction costs, but its limitations are notable.

The first limitation is that the internal supervising costs may exceed the market transaction costs. The second limitation is that the efficiency of the team production descends with the increase of the layers of division of work, and the positive externality of public goods may enhance the free-rider effect. In terms of governmental regulation, the traditional way is achieved by taxation, licenses and quota, but license and quota may lead to vicious competition of getting rights and even lead to rent-seeking. In addition, taxation may cause the inefficiency of resource allocation. Though an auction is just a way of transaction, there must be a method for the reallocation of resources in the transaction process. If an auction involves fair and voluntary participation, the result satisfies the motivation compatibility. Therefore, it can realize improvement of social welfare by competitive auction.

(2) Designing puzzle and implementing public resource regulation contract

From the angle of mechanism design, the main ways of incentive regulation, such as high price limitation and sharing the profits, are some of the fundamental characteristics of economic contract, showing that the short-term or long-term relations between the regulators and the enterprises have been regulated through negotiations. Although they could improve the enterprises' innovation and reduce costs, the defect is obvious. For example, the high price limitation may make the price deviate from the actual cost markedly, and then the total welfare will be reduced, especially in the cases that the varying range of the costs is big, or the enterprise could maintain its products in a low quantity without any penalty and the regulators have no way to avoid the enterprises getting much rent.

In practice, most of the projects of incentive regulation are achieved by contract. But because of the existence of the regulator's promise, asymmetry of information,

advancement of techniques, and other factors, which may cause moral hazard, adverse choices, and other issues, it is difficult to resolve these problems effectively either by short-term or long-term contracts. Nevertheless, the application of the auctions could show the real costs of the enterprises without considering the factors overall, which is important to ensure the realization of the public resources' values.

4.2.2 Auction and Rivalrousness Allocation of Public Resources

With the relaxation of the regulation and the governments giving up the right to use some public resources, it is the main problem of the incentive regulation mechanism that shows how to improve the use efficiency of the public resources on the precondition that the necessary social needs are satisfied. Because of some characteristics, auction can be used in the public resource allocation system, and it has gradually become a main mechanism.

There could be two auction mechanisms based on the characteristics of the public resources. The first one is the franchise bidding mechanism. Franchise bidding means that for the natural monopolizing industries, the government lets many enterprises compete for the exclusive right to serve, and according to some designed safeguards, lets the enterprise whose bid is the lowest supply the product or give the service. By adopting this approach, the fixed costs of the enterprise could be reduced by competition in the market entering phase. Since the bid is the least one, in the same market, the welfare received by consumers and government will be improved. For the enterprises, the project obtained by franchise bidding is always the area in which the fixed costs and the sunk-costs are very huge, such as water supply, seaports, airports, highways, and so on. The investment cannot be taken back in a short time. Therefore, they can be easily motivated to reduce many kinds of costs to realize maximum profit in the long run. It is obvious that there are some disadvantages for this mechanism: the

framework for the bidding still belongs to monopolization or oligarch monopolization. Thus, the enterprises have incentives to win over the regulators by rent seeking before bidding or collusion after submitting the bid; moreover, it is possible that the enterprises' use is predatory and their special investment to the public resources is in deficit.

The second mechanism is the direct bidding mechanism. It means that bidders report their own valuation directly, and then the seller decides the winner and the price according to certain auction rules. Direct auction could meet the incentive compatibility automatically, because the mechanism meets the requirement of the revelation principle, in which each bidder submits his private value to the subject independently, and according to the outcome, the seller decides the winner and the price.

This modified auction mechanism realized the functions of the market transactions. First, it is of value revelation characteristics, which makes the value of the public resources achieved through competition; second, it makes the scarce resources gained by the bidder who has the highest value; and third, the participants of the auction must promise to supply services for all the people and not to resell. Only by promising these things, will they having bidding rights. Once obtaining the object, the responsibilities become the limitations to the enterprises. Therefore, a new contract of self-restriction and incentive compatibility could be produced by an auction.

4.3 The Characteristics of Online Auctions and Mechanisms for Public Resource

Online auctions are different from traditional auctions because they exhibit some new characteristics, and it is necessary to consider the characteristics when designing online auction mechanisms. Four important characteristics of the online auction are as follows (Chen, Chen and Song, 2005):

First, the range of the participants is very broad. In traditional auctions, the bidders

are clear, both the seller and the bidder have a general knowledge about each other, and the information between the two is relative sufficient. But for the online auction, because it is based on the Internet, most of the auction sites do not give limitations to the bidders, except for a few auction sites adopting membership systems. Some auction sites only supply network platforms without knowing the information about the seller. Therefore, there are more uncertainties for the participants, both the sellers and the bidders, in the online auctions than in the traditional auctions.

Second, the process of online auction is complicated. The traditional auction is a relatively closed system. Once the auction begins, the number of the bidders is certain. The online auction, however, is a relatively open system. After the bidding begins, the bidders may come to participate in the auction continuously during the period. Thus, in the online auction, the arriving process becomes a tool to show the number of bidders. Moreover, in the online auction, the bidders can choose proper bidding parameters, such as the amount of bidding and when to bid, which makes the auction process more complicated.

Third, one must consider fraud, the biggest problem for online auctions, because supervision of the bidders and the sellers in the online auctions is not as easy as in traditional auctions. For example, because of the separation of the online auction process, regarding paying the bill and delivering the object, the transaction may not be successful even if the auction is a success. Whenever the bidder or the seller violates the contract, the transaction fails. In addition, just as mentioned in the literature review section; there are two additional kinds of fraud, the sellers using strategies to drive up the price of the object or the buyers using strategies to reduce the price of the object. Thus, when adopting online auctions, it is necessary to provide certain immunity against the possibility of fraud.

Fourth, in an online auction, products are abundant, and there are also many innovations. There are many kinds of products auctioned online. Nearly all products sold through fixed price in practice are available in online auctions. Some daily necessities are sold not only by online auctions but also by fixed price. In fact, a new challenge for online auctions is the sellers' competition. At the same time, the development of the Internet techniques reduces the innovation cost of the online auction patterns, and this is the reason the online auction patterns are colorful.

Because of the online auction's characteristics of low transaction costs and broad participation, it is a relatively ideal and promising way for the competitive allocation of the public resources, which have the characteristic of ownership by the general public and the service supplied by them is also shared by the public. The fraud problem caused by the online auction could be avoided effectively because the government is the seller, and it will take proper administrative and lawful actions to avoid the fraud phenomenon. Online auctions, in effect, are advanced technical realization of public resources' competitive allocation, and it is the realization of the traditional auction on the modern Internet.

The optimal online auction mechanism should include the following factors: the optimal auction amount; the optimal bidders' arrival rate, meaning the number of arriving persons in unit time such as every five minutes; and the optimal auction time. An online auction sometimes does not need to auction all the objects in one time period, but auction several times with certain objects each time. The optimal auction mechanism can also be expanded to multi-stages situations. Applying dynamic programming could resolve multi-stage decision-making issues, including working out the optimal auction time in every stage, the interval between two stages, and the optimal amount in every auction.

4.4 The Practice of Auction in China

4.4.1 Cases about auctions in China

Case 1: Auctioning Cab License in Shenzhen, China

In October 30, 2007, in Shenzhen, which lies in the coastal developed areas of China, new cab licenses were auctioned for the first time. The result was that 2,000 licenses were divided by 20 enterprises equally, the price of each license was 542,500 RMB, and the service life of each license was 12 years (NewsLink, 2009).

In the beginning, there were 51 enterprises approved by the city traffic bureau. But 11 enterprises did not pay margins on time. As a result, they were viewed as waivers of auction. Thus, there were 40 enterprises to auction 2,000 cab licenses at last. The rules of the auction included: each bidder only could get one object at most, that were 100 cabs; all 20 objects were auctioned simultaneously; bids began from low to high; after every bid, the auctioneer counted the number of bidders showing their cards. Those who did not show their cards were viewed as auction waivers.

At the live auction, the auctioneer announced the starting price, 150,000, which was a secret before the live auction. After nearly 80 times of showing cards, 20 of the 40 enterprises won the objects at the price of 542,500 RMB per license (NewsLink, 2009).

One enterprise that won the license expressed that it has an actual value of 550,000. Therefore, it was satisfied with the result, and it still could get profits. At the same time, it pointed out that those blue-brand cars, illegal operating cabs, interfere with the regular operation of legal cabs. Thus, the government should crack down on those blue-brand cars seriously. In addition, three months later, after the new cabs were put on the market, the city traffic bureau is required to evaluate the market. If the new cabs have great impact on the market, it is possible to reduce the monthly fee of the cabs.

Case 2: Auctioning Stands in Lanzhou, China

Two-year operation rights of 102 cold-drink and photography stands in a famous beauty spot were auctioned in April, 2007, in Lanzhou, which lies in western undeveloped areas in China. By auction, about 2,000,000 RMB were received. The public had different ideas about the auction: general citizens thought the behavior was inappropriate, new operators did not know whether they could make a profit or not, and old operators were angry with the action.

The 29th stand was auctioned for 52,000 RMB, which was the highest price in this auction. Is it worthy for a stand made up of “3 tables, 2 umbrellas, 1 refrigerator” to be auctioned at so high a price? The old operator of the 29th stand said that during the last 6 years, the highest annual income of the stand was about 11,000 RMB. If the cold drink price was not increased, the new operator paying 52,000 RMB would have a loss. Ms. Wang, who won the 30th stand at a price of 40,000 RMB, said clearly that she would give up the stand, because 40,000 RMB was too expensive to recover costs. In the past, there were two persons to operate every stand in two shifts. And there were nearly 160 persons, more than 90 percent of whom lost their jobs, to operate about 80 stands (GansuNews, 2009). But now the auction made some old operators lose their stands.

Small stands were auctioned at so high a price that it raised the public’s extensive attention. Mr. Xu, director of the beauty spot office, said that high price was the result of competition under a market-oriented economy. Mr. Wang, an old operator, expressed that it is unreasonable to squeeze out the old poor operators by auction. Mr. Li, the old operator of the 30th stand, thought that from the value deviation fact that a stand with only 10,000 RMB in income annually was auctioned 52,000 RMB, it could be clearly

seen as a way for the government to make profits from the public. Some other citizens also expressed they could not understand why the government auctioned the stands. Someone said that the auction, in fact, gave the poor people no way to survive. An expert said that some stands could not be sold through auction in the market at present, because the jobs provided for low-and-middle income earners are limited (GansuNews, 2009).

4.4.2 Case analysis

Vickrey (1961) has demonstrated that the result of using an auction in which the price is to be determined by the first rejected bid is Pareto-optimal. This statement is based on sellers' benefits. The "public" characteristic of public resources requires that they should be allocated openly, let every stakeholder know it, and make sure that everyone has the qualification to participate in the auction. Compared with administrative allocations, auctions can meet the "public" characteristic better. Case 1 is a comparatively successful example of an auction. Compared with other cities, in which the governments still use the administrative way to allocate cab licenses, the auction increases the openness and transparency and reduces rent-seeking possibilities. Because of the rationality of the auction rules, in the whole process, behaviors of the bidders were nearly rational and the winners' curse did not appear. Just as an enterprise expressed that its actual value was 550,000 RMB, it was satisfied with the auction result at the price of 542,500 RMB. Additionally, due to the characteristics of long-term usage and incremental values, in the case, the agency regulated the service life for 12 years. At the same time, the government will not give up the duty to regulate cab markets.

But situations are different when standards and settings of defining and judging Pareto-optimal results change from sellers to buyers. The winners' curse appeared in Case 2. Considering the benefits for the whole society, the auction was inefficient. A

government, as a ruler of public resources, is different from enterprises. It should represent and consider benefits for the general public. Maximum benefits of a seller cannot be the unique goal of public resource allocation. The purpose of a government, as the seller of public resources is not to pursue maximum income, but to optimize public resources' allocation. This is an analysis of the efficiency of public resources allocation when using auction mechanisms, which is very deficient in recent auction literature. In fact, results of an auction are totally different when putting on different settings or facing different objects, based on different purposes.

Public resources are owned by the general public. Thus, allocation of public resources should make the public get profit based on the principle of serving the public conveniently. About the standards of public resources allocation, two principles should be considered. The first one is equity. The second one is efficiency. According to the two principles, three questions should be answered before any auction of public resources: what is the goal of the auction? What rules should be designed? Who is to empower the auctioneer to auction?

Case 2 did not answer the three questions well. First, the goal of the auction should not be to maximize the seller's profits, but be a reasonable and efficient allocation of public resources. Compared with 200,000,000 RMB, the profits the government earned, it is more important to consider the problem of unemployment for about 160 persons. Maybe some of them or their families may sustain themselves by just relying on the stands. The result is inefficient, because they lost their sources of income after the auction. In addition, to keep the unique source of income, some stand operators cannot bid according to their actual values, which leads to the winner's curse. Second, the auction was not empowered by the public or the legislative departments. It is decided by the government agency, which holds the public resources. In current systems in

China, the public's interests have become some government sectors' interests at last.

About Case 2, if buyers' interests were considered, different auction rules could be produced. For example, the government could auction the resources only to the unemployed persons to set entry conditions to buyers. If others want to enter, the government can consider setting new stands. Also, it can set the maximum price before the auction. As the seller, the government is in a monopoly position. Therefore, the auction rules should consider buyers' interests more. But for some other public resources, such as the radio spectrum, land, mineral rights, and so on, the goal should be to maximize the sellers' interests. Thus, the highest value of the object can be achieved. Moreover, for public resources auctions, it is necessary to differentiate settings in order to set different goals and rules. Then, it is possible for the result to be Pareto-optimal.

In recent years, some local governments in China have not fulfilled their duties seriously, but have sold the paltry sundries by auctions, resulting in many disordered phenomena. For example, a local government sold a latrine at the price of 200,000 RMB. Then 5 RMB was charged for one time, which equaled half-day incomes of the people whose resource incomes come from local social assistance payments (Jiangsu Provincial Office, 2009). This result was deviated from the tenet of public services. In addition, online auctions, as a way of low-cost and high-transparency auctions, have not been applied in public resource allocations.

5 Conclusions

The most important element of an auction is the formulation of auction rules. The essence of an auction rule is to create a setting to attract the targeted people, especially important potential bidders, to realize Pareto-optimal results of public resource allocation, and to make all the participants bid according to the person's goal

who designs the rules. To understand this essence, it is necessary to know human nature.

Once a person exists, he or she has the will to cherish life and maintain that life naturally. In order to survive, humans must obtain the substances necessary to maintain life, but this leads to greed. The greed is everlasting because of the infinity of the need. At the same time, human nature is alterable, which means people could adjust and change their behaviors to conform to their environment. These two points are the fundamental origin to explain people's behaviors. Any specific behavior is a mutation in different settings driven by greed.

The designing of the auction rules is to set up a special setting for all participants. Because of human's alterability, setting up different rules is to inspire the bidders to take action instructed by their greed, being propitious to the person who sets up the rules. Therefore, different rules and different auction patterns are determined by different auction goals.

Because of the characteristics of natural monopolies, specialty assets, long time usage, and divisibility of public resources, and the limited rationality and the insufficient motivation of government officials, the real controller, the biggest goal of auctions is to find the maximum value of the object and to allocate it to the bidder who has the greatest probability to realize its value. The "value" is the current value, which may increase with the passage of time, and the increase may also be based on relevant public inputs because of public resources long time usage. Therefore, the auction rule of public resources often forbids reselling, promises to supply public service, and regulates the service life. For example, the service life of a wireless spectrum is often about 15 years. Choosing open ascending auction could lead to the Pareto-optimal result of the public resource allocation, because it can provide bidders

more information and then increase efficiency, so it should be the basic auction mechanism. Based on this basic mechanism and according to different characteristics of public resources, certain specific auction mechanisms could be yielded. Online auctions are promising in public resource auction, because of their broad participation and low transaction costs.

In addition, the rent-seeking problem broadly existing in the traditional public resource administrative allocation mechanisms can be resolved effectively in the auction mechanism. Unfortunately, this issue is not emphasized nor valued by some developing countries. The provision of three “third generation” (3G) mobile telecommunication licenses for free in January 2009 in China is a typical example.

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