ONLINE AUCTION EFFECITVENESS: OPTIMAL SELLING STRATEGY FOR ONLINE AUCTION MARKET

Chechen Liao\textsuperscript{a} Chiao-Ying Chen\textsuperscript{b}
National Chung Cheng University, 168, University Rd., Min-Hsiung Chia-Yi, Taiwan, R.O.C.
Email:ccliao@mis.ccu.edu.tw\textsuperscript{a} Email:e-mail:attachen@msn.com\textsuperscript{b}

ABSTRACT

The introduction of internet auction has significantly widened the pool of consumers who participate in auctions and increased the number of companies attempting to sell their products in an auction format. Previous empirical research on auctions has focused almost exclusively on the behavior of professional bidders. In this study, we collect data on a large number of internet auctions to explore the outcome of the auction in a real marketplace. In particular, we focus on the characteristic of seller, auction parameter and the effect of supply and demand, and examine these impacts on auction effectiveness.

Key word: Electronic commerce, Auction market

1. INTRODUCTION

The rapid development in IT and its applications in business have resulted in e-markets being increasingly popular. These markets can result in significant savings for both sellers and buyers. Online auctioning in particular is a rapidly expanding application [30]. Since the birth in 1995, online auction have grown at a tremendous rate. And it seems become a fascinating new type of exchange mechanism. The past decade has seen the advent and growth of online auction marketplaces, with online auction revenues expected to reach $36 billion by the year 2007 [14,32]. In recent years, online auction sites in Taiwan have conducted a lot of advertisement to attract the buyers and sellers enter the market, however, this market is still a novel for the most of consumers.

Previous empirical research on auctions has focused almost exclusively on the auction design and bidding strategies but non of them consider the selling strategies. For sellers, what kinds of strategies can raise their auction effectiveness which is the most important things they’re urgent to know, especially for those market-newer. This research addresses this gap. We empirically examine the various dimensions of on-line auctions to see weather those factors have impact on auction effectiveness. Using data collected from Yahoo!, to see weather the parameters of the auction website provided, and the external factors such as supply-demand rule have any impact on seller’s auction effectiveness. Try to build the optimal selling strategy to serve as a template for seller to follow.

The current study examines the structure of single-item auctions on an on-line auction site to see whether different auction parameters have effect on auction effectiveness or not. The purpose of this research is twofold. The first purpose is to investigate the relationship between the sellers’ characteristic, auctions parameters and the law of demand-supply and seller’s effectiveness to see weather these factors has effect on the auction effectiveness. The second purpose is to offer an optimal selling strategy for online auction market’s selling consumers. We focus on understanding different selling strategic to help those who intent to entry this market and for those who already in the markets show them how to adjust their selling strategy in order to maximize their auction effectiveness.

2. LITERATURE REVIEW

Auction Mechanisms

Auctions have a long history in human society. An auction mechanism sets out rules for bidding and allocates the goods to bidders based on the predefined rules set by sellers. Recent year online auctions have received increasing amounts of popular attention. Engaging in a non face-to-face environment, buyers have no confidence in this kind of transaction type [33]. Online auction market is more risky than any other kinds of EC market. The increase of online auction fraud scared the potential market participants away. eBay reports that it will happen one case of dishonest among every 25,000 transaction. The number of Internet complaints has increased threefold in 2002, and 46.1% of these complaints arise from online auctions (IFCC 2003). According to the report announced by Internet Fraud Watch in February, 2005, online auction is counted for 44% to ranked first in consumers’ complaints in the first half of 2005. Compared to the
statistic in 2004, it has dropped 7% in 2005. To eliminate the risky for auction users, online auction website introduce a new mechanism – reputation mechanism.

Figure 1 presents the research framework for the study. In summary, the model hypothesizes that measurement of seller’s auction effectiveness is based on seller’s characteristic, auction parameter, and supply and demand.

Reputation Mechanism
Reputation is defined as the current assessment of entity’s desirability as established by external person [57]. In order to lower the risk suffering the users, most online auctioneers develop the reputation system which is important to EC because it can provide efficient means to accumulate and distribute seller’s past trading behavior information to help buyers identify the honest sellers [49]. Reputation mechanism imitates word-of-mouth communication using online means [16,45]. Prior researchers have argued that trust is essential element for understanding interpersonal behavior in economic exchanges [4]. Seller with higher rating would be instrumental in reducing the amount of risk perceived by consumers in the online auction environment. Lucking-Reiley et al. [36], Melnik and Alm [39], and Houser and Wooders [25] all examine the impact of reputation on final prices in eBay auctions. These papers typically find that reputation matters, but not a lot. Lots of researches found that the seller with high ratings would get more revenue and more number of bids than those with lower ratings [4,36,38,39]. A number of researchers provided estimates for the value of reputation in eBay auctions and found that the amount of negative ratings negatively correlated with the final bid and that the amount of positive ratings is positively correlated with the final bid [25,36,39]. Other researchers indicated that reputation can also affect the probability of sale [20,39], probability of individual bidders entering the auction [7], and the number of bids[7,38]. It also affects buyers’ subjective assessments of a seller’s trustworthiness [4]. Simply put, sellers with higher reputation earn higher bids on their auctions than those with lower reputation.

Both positive and negative reputations are predicted to have an effect on price premium. However, the negative reputation has greater impact on the ability of sellers to sell their products at a higher price than positive reputation [56]. Since the more experience seller face more negative ratings, only measure the total negative rating score of the seller is unfair. Hence, we consider the NEG/POS ratio as the independent variable in which influenced the auction effectiveness. Thus, we hypothesize that:

\[ H_{1a}: \text{The higher NEG/POS ratio of the seller, the lower number of bids of the auction}. \]

\[ H_{1b}: \text{The higher NEG/POS ratio of the seller, the lower ending price of the auction}. \]
**H1c:** The higher NEG/POS ratio of the seller will decrease the likelihood of auction ending with a sale.

**Contact Intensity**

The relationship is a connection between a seller (firm) and its customers that could be strong, weak, or nonexistent. Buyer-seller relationships are the best examples of exchange relationships because the primary purpose is the trading of products or services for monetary compensation. A typical buyer-seller relationship is through to have five stages: awareness, exploration, expansion, commitment, and dissolution [19,40]. Mohammed et al. [40] noted that customers do not necessarily pass through all stages. Dwyer et al. [19] indicated that awareness is a unilateral, pre-exchange process. In this stage, buyer recognizes that the seller is a potential exchange partner but has not initiated any communication with the seller or purchased any of its products. At the second stage - exploration/expansion, the customer considers the possibility of exchange and perhaps initiates trial purchases. Mohammed et al. [40] noted that the exploration stage is focuses on attraction, the development of trust and norms, the establishment of power relations, and satisfaction. In the third stage – commitment, the parties in a relationship feel a sense of obligation or responsibility to each other. Final stage is the dissolution stage, it occurs when one or both parties exit the relationship [40].

Mohammed et al. [40] indicated that as buyers and sellers move through the relationship stages, there should be a pattern of interaction intensity, defined as the frequency of interaction. Interaction intensity or contact intensity is the frequency with which the salesperson communicates (face-to-face or indirectly) with the customer either for personal or business purposes. In the field of relational selling, contact intensity reflects an effort on the part of the salesperson to open up the communication channels with the customers and exhibit a commitment to the relationship [15]. It is obviously that in the awareness stage the level of interaction between buyer-seller is limited. However, in the exchange stage, the number of interactions increases very quickly. Customer visits the specific web page to assess the seller (firm) as an exchange partner. They may check out sections related to the frequently asked questions (FAQs) [40]. The association between relationship stage and interaction intensity is represented in Figure 2.

![Figure 2 Level of Interaction by Stage of Customer](image)

*Source: Mohammed et al. (2004)*

According to Crosby et al., the relational selling behaviors refers to a behavioral tendency exhibited by salesperson to bring up the relationship between buyer and seller, including contact intensity, cooperative intentions, and mutual disclosure [15]. As long as the increase of relationship quality, the customer will increase the anticipation of future interaction with this seller. Therefore, the contact intensity will increase the buyer’s perceived trust and reduce the buyer’s perceived risk from the uncertainly of purchases on-line. Especially in the online auction environment, the interaction between seller and buyer is the most important way to reduce the uncertainly. By increasing the interaction, it would instill confidence of buyer in online shopping environment.

Contact intensity refers to the degree which the seller contacts with his customer. Yadav et al. [61] indicated that greater interactivity in the e-marketplace can result in better consumer decision-making, greater incidence of negotiated pricing, or greater efforts by firms to acquire access to information regarding consumers’ transactions and consumption behavior. As the seller opened his/her communication channel to the customers, it help buyers make the shopping decision easily. Although this communication channel (e.g. FAQs), the buyer can question about the auction item, seller can reply these question as soon as he/she see the questions. It doesn’t necessary for sellers to answer every questions, the seller have the choice to decide which question he/she would like to answer. A good seller should keep higher contact intensity with his/her customer. From the view point of the buyers, sellers who answer every question should with plenty of responsiveness which buyer would like to make deal with him/her. Thus, we hypothesize that:

- **H2a:** The higher contact intensity of seller, the more number of bids of the auction.
- **H2b:** The higher contact intensity of seller, the higher ending price of the auction.
- **H2c:** The more contact intensity of the seller will increase the likelihood of auction ending with a sale.

**Information Richness**
In online shopping environment, customer’s decision-making process is influenced by the size of the online shopping mall, the services provided, design factors, and the information content of the homepage [31]. In a physical environment, consumers can touch and feel the products and freely communicate with sellers. Conversely, the online environment makes consumers hard to deal with the virtual interactions with sellers. This is especially true in an auction with poor information presentation where users might be uncomfortable with the uncertainty and ambiguity caused by lack of interaction with sellers.

Several researchers have shown that modes of information presentation affect online shopping behavior [13,24,31]. A good user interface with an appropriate mode of information presentation is the key to system acceptance and usage. While the auction site’s interface has been restricted, the information presentation is totally control by the seller which means seller has the power to decide how many information to provide. Seller on the e-auction can choose to provide the text or picture of the item, or even both. Online auction sites allow or even encourage sellers to post messages or picture regarding the bidding objects or to their trading partner. A picture may serve at several functions for the consumer bidding on an item: it can assure the buyer that the seller has experience and expertise in online auctions [44].

Both of these functions help reduce the high level of perceived risk that is inherent in buying situations where the buyer cannot personally inspect the item being sold or the person selling the item.

It is impossible for buyer who engages in online auction transaction to inspect the item in person before placing the bid. Therefore online auctions bidders usually estimate the item by the pictures and description provided by the seller. A perfect description and a clear picture can let bidders understand the auction item’s status making the right estimate of the item. Overall, the more complete information provided by seller will lead more bidder engage in the auction, and increase the final price of the auction. D’Souza and Prentice [18] examined the traditional art auction and indicated that place additional information in the catalogue is associated with higher realized prices. Melnik and Alm [39] found that the presence of photo image increases the willingness to bid on the item. Also, McDonald and Slawson [38] indicated that auction with less information available, will receive fewer bids. Previous researches have already showed that additional pictures should increase the buyer’s confidence in the item to be purchased and increase the final price [20,38,39]. In short, the level of information richness would expect have influence on the auction effectiveness. Thus, we hypothesize that:

- **H4a**: The higher level of information richness, the more number of bids of the auction.
- **H4b**: The higher level of information richness, the higher ending price of the auction.
- **H4c**: The higher level of information richness will increase the likelihood of auction ending with a sale.

**Auction Parameter**

On-line auction services allow sellers to specify a number of different parameters when listing an item for auction. Among these are the number of days the auction will take place, the amount of reserve price the minimum acceptable price for the seller, the level starting price, the Buy-It-Now function allow the auction to close immediately, and the ending rule. Now let us take a look at these parameters.

**Auction Duration**

Sellers in auction set the length of the auction that will be open for bidding. The included of the auction duration is that a longer auction increases the number of potential buyers who may visit the site. Bapna et al. [8] contradict the notion that longer auction duration will lead to increased revenues for the seller. Lucking-Reiley et al. [36] also indicated that longer auctions tend to attract more bidders and earn higher prices. On the contrary, in Melnik and Alm’s study, they found non-significant relationship between the length of the auction and the prices [39]. The result is the same with Wood et al. [60] posed that a shorter auction did not lead to a higher price. In spite of the divergence, we expected that the longer duration of the auctions should experience more bids as well as the high price and probability of sale. Thus, we hypothesize that:

- **H5a**: The longer auction duration, the more number of bids of the auction.
- **H5b**: The longer auction duration, the higher ending price of the auction.
- **H5c**: The longer auction duration will increase the likelihood of auction ending with a sale.

**BuyNow Function**

Standifird et al. [57] argued that the way price established in e-auction is distinguished it from other types of e-commerce. In most types of e-commerce, the price is determined by the seller, but auction prices are variable because of the process of active bidding. But now the fixed prices are introduced into auction format - the “BuyNow” function. It’s the price that bidder can pay to immediately truncate the auction and purchase the item [57]. The idea of the “BuyNow” function is to allow the buyer submit a specific bid to buy an item and truncate auction in advance. When a “Buyout” actually occurs, it benefits buyer and seller by bringing the auction to a close in a shorter period. The buyer gets certain victory, but dose not know whether she might have been able to pay less had the auction continued. The seller gets a certain high price, but gives up the chance that bidding might have gone even higher had the auction
continued.

There is a few but growing literature on auctions with a buy price. Mathews (2002) models eBay BuyItNow auctions with risk-neutral bidders and found that a risk-averse seller can raise his expected revenue by setting a buy price in advance Busish and Takeyman [10] argued that by reducing the risk for some high-value bidders, the BuyNow price enables the seller to extract the premium for risk reduction. Consequently, when bidders are risk averse, set an optimal BuyNow price can increase the expected revenue for seller. Matews [37] argues that a Buy-It-Now option is likely to be attractive both to time-impatient bidders and sellers.

We take “BuyNow” price as the “seller-provided reference prices”. The Theory of Price assumes that price influences buyers’ choice because it serves as an indicator of cost to the buyer. Customers usually adopt the price-revealed information as a clue to assess the quality of the product [41]. Many studies have examined the relationship between price and perceived quality. Rajendran and Tellis [48] indicated that when choosing among goods consumers retain a standard price as reference price to compare. The divergence in consumers’ internal price has led to viewing it as a range of prices – the lowest average, and highest price [1]. And finally consumers’ highest price estimate will move toward the reference price.

Previous researcher has indicated that the price is a signal of the value of goods. A higher price may reflect superior quality or high production cost associated with high quality and increase customer’s willingness to buy eventually [1,26,41]. In online auction environment, the BuyNow price reveals the value of a product through sellers’ perception of the value of the specific product. The present of reference price will change the consumer’s internal price of estimate in specific product. In this study we tend to view BuyNow price as a “reference prices” which provided by the seller regarding the value of the item for sale and have positively influence on the consumer’s willingness to buy. By attractive more potential bidder place and increase the probability of sale, this reference price (BuyNow price) can induce the highest price under the bidders’ estimation. If the seller set the high BuyNow price, we expected the auction will led to higher earnings for sellers. Thus, we hypothesize that:

\[ H_{5a}: \text{Auction with a high reference price (BuyNow price) would result in higher number of bids.} \]
\[ H_{5b}: \text{Auction with a high reference price (BuyNow price) would result in higher ending prices.} \]
\[ H_{5c}: \text{The higher reference price (BuyNow price) will increase the likelihood of auction ending with a sale.} \]

Ending Rule

Many experienced bidders do not enter until the last minute to avoid early price wars and signaling. This prevalent behavior has been termed sniping [9]. This sniping bidding strategy which adopted by bidders some how influences the seller’s welfare. One way to diminish the loss of seller is to set an appropriate ending rule. There are several kinds of ending rules in on-line auction sites. Some rules give bidders an incentive to bid late, which hampers price efficiency and discovery. Basically, we could divide the ending rules into two types: a hard ending rule and a soft ending rule. A hard ending rule means the auctions have a fixed deadline, they end in a specific time, such as eBay. A soft ending rule auctions will be automatically extended if necessary, past the predefined ending time, until ten minutes have passed without any bid being submitted, such as Amazon. The eBay and Amazon have the different ending rule regulation, and the participants have no opportunity to choose the rules. However, there are also some other auction houses which let the sellers choose the ending rule they like, such as Yahoo!

Roth and Ockenfels [51] found that the unpredictable end time (a “soft close”) prevent the bidders form late bidding in the auctions. And the use of different ending rules give bidders more reasons to bid late on eBay than on Amazon. Ariely et al. [3] conducted an experiment to investigate the effects of auction closing rules on bidding behavior and found that there is much more late bidding with the hard ending rule than with the soft ending rule, and this tendency increase with experienced bidders. Moreover, they also found that soft ending rule is slightly more efficient and yields higher revenues than the hard ending rule auction. That is to say, the ending rule may have impact on bidding behavior (multiple bids or single bid at last minute) and the auction revenues (ending price).Here we expect that the soft ending rule can not only avoid the late bidding behavior of the bidders, but also increase the seller’s effectiveness of the auction. Therefore, seller who sets his/her auction as “soft ending” may increase the auction effectiveness but only on the number of bids and the ending price. Thus, we hypothesize that:

\[ H_{6a}: \text{The auction with a soft ending rule will positively influence the number of bids of the auction.} \]
\[ H_{6b}: \text{The auction with soft ending rule will positively influence the ending price of the auction.} \]

Starting Price

One way to attract Web traffic is to set a very low opening bid, such as one dollar. The most common argument is that a high starting price tends to scare away potential bidders, which may result in the good not being sold at all [27]. By contrast, a low opening bid can smooth the bidding process, building up bidding “momentum” therefore raising the ending price. Previous researches found that as the minimum bid increases there will be a sharp drop-off in the number
of bidders [6,36]. In this study, we attempt to find out the relationship between the starting price and the auction effectiveness. Wood et al. [60] indicated that the starting price is the first piece of information that sellers use to signal the value of an item (set higher) or to attract bidders (set lower). We expect a negative relation between the starting price and the number of bids, a positive relation with ending price and will increase the probability of auction ending with a sale. Thus, we hypothesize that:

\[ H_{7a}: \text{The lower starting price of the auction, the higher number of bids of the auction.} \]
\[ H_{7b}: \text{The lower starting price of the auction, the lower ending price of the auction.} \]
\[ H_{7c}: \text{The lower starting price will increase the likelihood of auction ending with a sale.} \]

**Reserve Price**
The reserve price is the lowest price in which seller willing to accept for the auction item sold out. In a traditional auction house, the bids continue increasing until the point when no bidder is willing to raise the current bid higher. But if the highest bid amount dose not exceed a reserve price which specified in advance by the seller, the item will not be sold to the highest bidder. No bidders know in advance the amount of the secret reserve. Online auction sites allow sellers to keep reserve price amounts secret, but they do inform bidders whether or not a reserve price is in effect. As bidding proceeds, the current high bidder’s identity and bid amount are updated, only if the reserve price is finally exceeded, the auction would end with a sale.

Lucking-Reiley et al. [36] found that the presence of reserve price increases the auction price by about 15% on average. To extent that bidding process requires precious effort, reserve price might actually drive bidders away [35]. The reason is that most buyers do not like reserve price auctions and will avoid them. For bidders, it is very upsetting to win an item only to be told: your winning bid was not high enough. Over use of high reserves will force people to bid on other items. Katkar and Lucking-Reiley [27] found that establishing a higher public reserve price is a preferred seller strategy to having a trivial opening bid with a higher secret reserve price. Thus, we hypothesize that:

\[ H_{8a}: \text{Auction with reserve price will negatively influence the number of bids of the auction.} \]
\[ H_{8b}: \text{Auction with reserve price will positively influence the ending price of the auction.} \]
\[ H_{8c}: \text{Auction with a reserve price will decrease the likelihood of auction ending with a sale.} \]

**The Variation of Supply and Demand**

Online auction is one of the dynamic pricing mechanisms which defined as the buying and selling of goods in markets where prices are free to adjust in response to supply and demand conditions at the individual transaction level [22]. Internet auction market is just like any other market which could be influenced by fluctuation of supply and demand. In the online auction market, sellers set the rules and bidders decide the final price. The auction is a market-based mechanism that allows the price of items to vary in order to reconcile discrepancies between supply and demand [60]. McDonal & Slawson [38] also indicated that supply and demand should affect the auction effectiveness. The final price should influence by the volume of demand and supply. Therefore, in this article the researchers included these two variables - demand and supply.

Demand refers to the willingness and ability of people to purchase the good or service in the market. That’s a common-sense point: the more people require the item, the higher the price will be. The relationship between price and the amount of a product people want to buy as: demand gets higher, the price would increase. The supply is the opposite of the demand. With more demand on the specific product, the seller will be willing to make more and sell more. As more and more item sell on the market, the price competition open up thereby price goes down. Consumers want to pay as little as they can, as a result, consumer will choose the cheapest item. This may minimize seller’s profits.

We may consider demand as a force tending to increase the price of a good, and of supply as a force tending to reduce the price. Even assuming all the correct conditions, does the variation of supply and demand really lead to the maximization of human economic well-being in some sense? In this paper we’ll examined online auctions environment to see weather the supply or demand have any impact on seller’s revenue (auction effectiveness). Thus, we hypothesize that:

\[ H_{9a}: \text{The more number of auctions end in same date, the lower number of bids of the auction.} \]
\[ H_{9b}: \text{The more number of auctions end in same date, the lower ending price of the auction.} \]
\[ H_{9c}: \text{The more number of auctions end in same date will decrease the likelihood of auction ending with a sale.} \]

According to the survey of TWNIC - 2005 shows that the Internet users usually surf Internet during the time slot from 19:00~24:00. We propose that the auction end in the high terrific period will attract more potential customers and may attract more bidder place the bid, therefore, lead a successful auction and increase the final prices. Thus, we
hypothesize that:

\[ H_{10a}: \text{Auction which ends in the high traffic period would result in higher number of bids.} \]

\[ H_{10b}: \text{Auction which ends in the high traffic period would result in higher ending price.} \]

\[ H_{10c}: \text{Auction which ends in the high traffic period will increase the likelihood of ending with a sale.} \]

3. DATA AND EMPIRICAL ANALYSIS

Online auctions present researchers with exciting opportunities to conduct field study. Rather than passively waiting for firms and consumers to generate data that may or may not contain the exogenous variation required to test a theory, the researcher can participate actively in a market to collect data from the actual field environment [27]. With hundreds and thousands of auctions closing everyday, field data on online auctions are quite sufficiently, researchers have begun to exploit this rich source of data to investigate certain questions. In order to examine the auction effectiveness, we select a sample of homogeneous items sold frequently on Yahoo!. Because of the large number of ongoing auctions at the time the iPod Shuffle 512MB MP3 player has been selected. The analysis of data from actual auctions mitigates the criticism that subjects lacked incentives to develop optimal selling strategies. Additional benefits of selecting this item are (1) a relatively large supply of the item; and (2) the standard specification which allow us to conduct the analysis.

Data Collection Process

In order to verify the hypotheses, this study was collected the auctioning of products on Yahoo!. The data set consisted of the auctions completed from September 15, 2005 – October 15, 2005 for 1 month. We collected the data from Yahoo and select a sample of homogeneous items sold frequently on Yahoo. Because of the large number of ongoing auctions at the time, we selected the iPod shuffle 512MB. Data were collected by hand on several relevant variables including the seller’s rating, contact intensity of seller and buyer, measures of information provided, auction options, such as: reserve price, ending rule, or buyout price, whether a sale was made, the number of bids and the final bid price. And it was chosen by certain selection criteria as followed. First, auctions were only included if they were provided “BuyNow” price. The analysis proceeds by examination the effect of different level of “BuyNow” price to auction effectiveness. Therefore, the auction without a “BuyNow” price would be eliminated. Second, the auction item must be new. On the C2C on-line auction site, there are usually sales a lot of secondary goods. For this analysis is to measurement the effectiveness of the auction included the ending price, number of bids and probability of sale, in the light of the new and secondary goods would end with different price level (especially the different status of the secondary goods). Hence, the criteria of “new” item must be strict in this research. Third, auctions with multiple quantities were excluded because the bidding behaviors between single quantity and multiple quantities might be different. Only auctions with single item were collected in the samples. In addition, we had examined other e-retailers which sell the digital product in order to inspect the price variation. Prices at major virtual retailers such as PChome.com, Yahoo.com, and tomorrow.com ($3499, $3499 and $3599 respectively) remained constant throughout the time period of the study.

In brief, the samples were collected from the criteria mentioned above. The bid histories of the samples were collected from Yahoo. In total, 279 auctions were selected in the samples. Of the original dataset (279), 6 items had been closed by the seller who didn’t illustrate the reason why doing so, therefore we excluded those from the analysis, leaving a sample size of 273. Among these 273 observations, 135 items were actually end with a sale. Therefore, the total 273 observations will be using as the sample to analysis the “likelihood of auction ending with a sale or not”. For the analysis of the number of bids and the ending price we use the 135 observations which end with a sale as a sample. In session 4 we will brief describe the data analysis method.

Although the various on-line auction sites use many different formats to support their auctions, the present study focuses on Yahoo! auction site. Since Yahoo! is the most popular consumer-related on-line auctions site in Taiwan, an examination should yield sufficient data to draw well-supported conclusion that will be applicable to other auction sites with a similar market structure.

Table 1 provides the total variables used in the empirical analysis and the hypothesized relations with number of bids, likelihood of auction end with a sale and the ending price. For example, the seller’s NEG/POS Ratio will negative influence the number of bids, ending price and the likelihood of auction ending with a sale.

<table>
<thead>
<tr>
<th>Variable</th>
<th>NOB</th>
<th>EP</th>
<th>LAES</th>
<th>Remake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ending Price (EP)</td>
<td></td>
<td></td>
<td></td>
<td>Dependent Variable</td>
</tr>
<tr>
<td>Number of Bids (NOB)</td>
<td></td>
<td></td>
<td></td>
<td>Dependent Variable</td>
</tr>
<tr>
<td>LAES^1</td>
<td></td>
<td></td>
<td></td>
<td>Dependent Variable</td>
</tr>
<tr>
<td>NEG/POS Ratio (NPR)</td>
<td></td>
<td></td>
<td></td>
<td>Independent Variable</td>
</tr>
</tbody>
</table>
This paper estimates equations for the (1) likelihood of auction ending with a sale, (2) the ending price and (3) the number of bids. To assessment the likelihood of auction ending with a sale, the logistic regression analysis will be conducted with the seller characteristics, the auction parameters, and supply/demand effect as predictor variables, and end with a sale as the class variable. Use the multivariate multiple regression to test the number of bids and the ending price. And also this study will conduct the canonical correlation analysis to verify which factor has greater effect on which dependent variables – number of bids or ending price. For those with non-metric variable use the dummy variable to conduct the analysis.

Profile of the Samples

Table 2 shows the characteristics of the data along with the variable’s definition and the measurement. Finally, it should be noted that thought 273 samples were presented for sale at this auction, a total of 135 of them were sold. For all regressions on estimated prices we use the 135 observations. For all regressions on probability of sale and number of bids we use all 273 observations.

### Table 2 Sample characteristics

<table>
<thead>
<tr>
<th>Variable/Statistics</th>
<th>Definition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neg/Pos Ratio</td>
<td>The ratio of negative rating to positive rating of the seller.</td>
<td>Measured the percentage of seller’s negative feedback ratings.</td>
</tr>
<tr>
<td>Mean= 2.56 / S.D.= 9.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact</td>
<td>The frequency of the seller contact with the buyer.</td>
<td>Measured the number of Q&amp;A records of the auction.</td>
</tr>
<tr>
<td>Mean= 2.55 / S.D.= 2.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Richness</td>
<td>The degree of the information provided by specific seller.</td>
<td>Level 1: Only description with no picture. Level 2: Simple description with 1 picture. Level 3: Simple description with 2 more pictures or explicit description with 1 picture. Level 4: Explicit description with 2 more pictures.(Observed by the author)</td>
</tr>
<tr>
<td>Level 1 8.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2 29.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 3 9.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 4 2.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration</td>
<td>The length of the auction will be open for bidding.</td>
<td>Measured in days.</td>
</tr>
<tr>
<td>Mean= 9.1 / S.D.= 2.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting Price</td>
<td>The minimum bid price which set by seller.</td>
<td>Measured in NTDS.</td>
</tr>
<tr>
<td>Mean=2427.5 / S.D.=1054</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BuyNow Price</td>
<td>The BuyNow price is the price which a seller willing to close the auction immediately and sell their item.</td>
<td>Measured in NTDS.</td>
</tr>
<tr>
<td>Mean=3116.4 / S.D.=236</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reserve Price</td>
<td>The lowest acceptable price at which to sell the property.</td>
<td>0 auction with no reserve price 1 auction with reserve price</td>
</tr>
<tr>
<td>Yes 8.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No 90.8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. CURRENT STATUS AND FUTURE WORK

Presently, we had already developed the research model and brought out the hypotheses which based on the previous researches. Also, we have already collected the field data which gathered from the Yahoo online auction site. The following work will be analysis the data with the SPSS statistic analysis tool and using the multivariate analytic technique to analysis.

REFERENCES


### Web


