

## PRICE DETERMINANTS IN ONLINE AUCTIONS: A COMPARATIVE STUDY OF EBAY CHINA AND US

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### ABSTRACT

This study applies online auction theories developed in the US to a different national and cultural context (i.e., China). After summarizing and comparing factors that drive price across online auctions in China and the US, this study is able to identify similarities and differences. Specifically, the starting bid and seller reputation have been shown to have similar effects on price, though the magnitude of the effect varies among cultures. The number of product pictures has a significantly positive effect on price only for eBay China auctions, while the opposite is true for bidder expertise and auctions ending on weekends. These differences are further explained from cultural and institutional perspectives.

Keywords: online auction, auction price, eBay, China, price determinants.

### 1. Introduction

The worldwide growth of online auctions has been explosive in the past decade. According to Forrester Research [[www.forrester.com](http://www.forrester.com)], online auction sales in the US have increased from \$8.4 billion in 2001 to \$28.2 billion in 2004, representing a 33% annual growth rate. By 2007, online auctions in the US are estimated to generate \$54.3 billion in sales. Though the online auction market size in China is rather small as compared to that in the US, it has grown at a surprisingly high rate in recent years. According to IResearch, a Shanghai-based Internet market-research firm, online auction sales in China have increased from \$51 million in 2001 to \$434 million in 2004, representing a 104% annual growth rate. By 2007, the sales are expected to reach \$2.68 billion.

As a result of this tremendous growth, it is becoming increasingly important to understand how sellers and bidders behave in online auctions. For sellers, in order to maximize their revenues, they must make decisions about the auction design or selling strategies (e.g., the amount of the starting bid, the number of product pictures, etc.). For bidders, in order to get a good deal, they must make decisions about which auction to enter and how much they wish to pay for an auction item. Therefore, developing an understanding of how the auction price is determined is beneficial for both sellers and bidders. This type of knowledge certainly influences how sellers design their auctions and how potential bidders make their entry and bidding decisions.

While a growing body of research exploring the price determinants in online auctions is beginning to emerge in the US [Ariely and Simonson 2003; Bajari and Hortacsu 2003; Brint 2003; Gilkeson and Reynolds 2003; Kamins et al. 2004; Kauffman and Wood 2006; Park and Bradlow 2005], it is not clear how well these studies and associated theories translate to other cultural contexts. As indicated by Farley and Lehmann [1994], cross-cultural differences often affect the ability to generalize theories developed in the US, and thereby their external validity must be assessed before they can be universally accepted.

This study makes an important first step in applying online auction theories developed in the US to a different cultural context (i.e., China). The objective is to further our understanding of price determinants in online auctions among cultures. The approach is to compare and summarize factors that may influence the online auction price between the China and US markets. Specifically, this study examines how price determinants differ across eBay China and US and explains why these differences may exist.

The remainder of this article is structured as follows. First, a literature review is provided to discuss the factors that may influence the auction price, and research hypotheses are then developed. Second, data collection and description are presented. Third, hypotheses are empirically tested and a discussion of the results is also provided. Finally, the study closes with conclusions and implications for future research.

## 2. Theoretical Development and Research Hypotheses

This section will review a number of factors that may have an effect on the auction price, including the starting bid, the reserve price, the Buy-It-Now option, the product picture, the auction length, the auction closing day, bidder expertise, and seller reputation. Research hypotheses are then developed accordingly.

### 2.1. Starting Bid

Sellers are required to set a starting bid for their items, which has led to studies on the effect of the high vs. low starting bid on the auction price. Empirical studies in the literature have shown mixed results. Some studies find a significantly positive effect [Bajari and Hortacsu 2003; Brint 2003; Haubl and Leszczyc 2003; Lucking-Reiley et al. forthcoming], whereas others report a negative one [Ku et al. 2005, 2006].

The positive effect of the starting bid on price is often explained as a result of the “value construction” mechanism [Haubl and Leszczyc 2003; Kamins et al. 2004] in which the starting bid serves as an informative (quality) indicator of the auction item’s value and thereby having a positive effect on a bidder’s valuation of such item. Consistent with this mechanism, Brint [2003] indicates that the positive relationship between the starting bid and the auction price only holds for items whose market price is hard to determine. Similarly, Ariely and Simonson [2003] find that the starting bid results in a higher auction price only when comparable items are not available.

The negative effect of the starting bid on price is often due to “auction fever” [Ku et al. 2005, 2006]. With auction fever, bidders become “caught up” by the competitive nature of auctions with a low starting bid and bid more than their true valuations. For example, Herschlag and Zwick [2002] report that online bidders tend to lose control while bidding and buying because of the thrills they obtain from winning a competitive auction. A low starting bid attracts more bidders, leads to a bidding war, and eventually drives up price [Ku et al. 2005].

To reconcile these conflicting results, Li et al. [2004] argue that the starting bid may have two different types of effect on price – quality signaling effect and common value effect. The quality signaling effect implies that the starting bid serves as a quality indicator thus helping bidders construct their valuations, and the result is a positive relationship between the starting bid and price. Conversely, the common value effect implies that a bidder’s valuation of an auction item is influenced by his or her competitors’ bidding behavior; therefore, the more competitive the bidding process, the higher the auction price, and the result is a negative relationship between the starting bid and price. Li et al. [2004] further indicate that in order to examine the quality signaling effect, the common value effect (i.e., auction fever) must be controlled.

The present study will test the signaling effect of the starting bid on price by controlling for the common value effect (i.e., the number of bidders in the same auction). Thus, a positive relationship is expected. Formally,

*H<sub>1</sub>: The amount of the starting bid is positively related to the auction price.*

### 2.2. Reserve Price

Auction sites allow sellers to set a minimum acceptable bid that must be met for a transaction to occur. Potential bidders are shown whether or not an auction has a reserve price and, if so, whether or not the reserve price has been met, but the amount remains confidential. The reason why sellers sometimes set a reserve price for the bidding object is to avoid it being sold at a price lower than their own valuations of the object.

In traditional auctions, it is often believed that setting a reserve price can raise the seller’s revenue [Milgrom and Weber 1982]. Some empirical studies in online auctions support this notion [Bajari and Hortacsu 2003; Li et al. 2004; Lucking-Reiley et al. forthcoming], though a few state otherwise [Katkar and Reiley 2006]. For example, Lucking-Reiley et al. [forthcoming] find that in eBay’s coin auctions, a reserve price can increase the final price by about 15% on average. Similarly, Standifird [2001] finds that the presence of a reserve price has a mildly significant positive effect ( $p = .091$ ) on the final bid price in auctions of consumer electronics.

Though Katkar and Reiley [2006], in their field experiment selling Pokemon cards, find that a hidden reserve price has a negative effect on the auction price, they further indicate that such negative effect may only exist for low-priced items (approximately \$7 in their study), whereas for high-priced items, a hidden reserve price may drive up the auction price.

This study investigates a relatively expensive item. Thus, a positive relationship between a reserve price and the auction price is expected. Formally,

*H<sub>2</sub>: The presence of a reserve price is positively related to the auction price.*

### 2.3. Buy-It-Now

In most online auction sites, sellers have an option to set a fixed price for their auctions, namely, a “Buy-It-Now” (BIN) price. Buyers can choose either bidding on an item or buying it instantly through BIN. At eBay, once a bid is placed, the BIN option disappears; for an auction with a reserve price, the BIN option will not disappear until the reserve price is met.

There are several notable studies in this area. Reynolds and Wooders [2005] make a comparison between the impacts of BIN on the auction price with respect to two different rules for BIN settings. At eBay, the BIN option

disappears once a bid is placed, whereas at Yahoo!, the BIN option remains in effect throughout the auction as long as the highest current bid does not exceed the BIN price. Their findings indicate that Yahoo!'s BIN setting yields more revenues for sellers than eBay's setting after controlling for the BIN price.

Studies have also shown how the BIN option is adopted by various types of sellers and bidders. Wang et al. [2004] indicate that impatient sellers use this option to avoid both transaction and monetary costs of the bidding process. Budish and Takeyama [2001] suggest that the BIN price gives risk-averse bidders an option to buy an item without risking paying more for it by bidding. Finally, Carare and Rothkopf [2005] indicate that the BIN feature provides an option for buyers with strong time constraints.

Considering that the BIN price is optional and associated with certain costs, it is reasonable to assume that sellers may be more willing to execute this option when they offer high-quality items. In particular, recent studies suggest and empirically demonstrate that a BIN price can serve as a reference point or a quality indicator that positively influences a bidder's valuation of the item [Bajari and Hortacsu 2003; Kamins et al. 2004; Li et al. 2004]. Therefore,

*H<sub>3</sub>: The presence of a BIN price is positively related to the auction price.*

#### 2.4. Product Picture

Similar to the reserve and the BIN price, picture posting in online auctions is also optional and associated with costs. According to signaling theory [Spence 1974], sellers of high-quality products are more likely to accurately inform buyers so as to be rewarded by offering such goods, whereas sellers of low-quality products tend to hide their product information. Picture posting provides an effective way to inform bidders. Furthermore, as indicated by Yin [2005], increased product information reduces quality uncertainty and thereby drives up price.

At eBay, having a picture almost becomes a norm. For example, Dewally and Ederington's [2006] sample has 3,664 auctions, 96.5% of which have a picture, while Li et al. [2004] report 98% of their auctions have a picture. Both studies find that auctions with product pictures receive a significantly higher price than those without any picture. Similarly, Eaton [2002] also reports a positive effect of picture posting on the probability of a sale as well as the auction price.

All three aforementioned studies use a dummy variable to measure the effect of picture posting. A limitation of this type of measure, however, is that it treats an extremely large percentage of auctions as the same regardless of how many pictures these auctions have. The result is an information loss. One solution is to use a continuous measure of picture posting, that is, the number of pictures in the same auction, under the assumption that more pictures mean better product information. As a consequence, the present study extends previous findings by hypothesizing that auctions with more pictures are likely to receive a higher price than those with fewer pictures. Formally,

*H<sub>4</sub>: The number of product pictures is positively related to the auction price.*

#### 2.5. Auction Length

Online auctions generally last 1, 3, 5, 7, 10, or 14 days. Intuitively, a longer auction seems likely to be visited by more bidders than a shorter auction. With more bidders, people tend to overbid and the probability of higher prices increases [Ku et al. 2006; Melnik and Alm 2005]. Previous studies have empirically shown that longer auctions are likely to result in a higher winning bid after controlling for the number of bidders in the same auctions [Dewally and Ederington 2006; Lucking-Reiley et al. forthcoming]. For example, Lucking-Reiley et al. [forthcoming] find that the final prices of 7-day and 10-day auctions are, on average, about 24% and 42% higher than those of 3-day and 5-day auctions, respectively.

Based on the above analyses, the following hypothesis can be stated:

*H<sub>5</sub>: Longer auctions tend to receive a higher price than shorter auctions.*

#### 2.6. Closing Day

Auctions can end on a weekend (i.e., Saturday or Sunday) or weekday. Since bidding requires time and effort and bidders also tend to enter an auction at the late stage [Roth and Ockenfels 2002], considering bidders are flexible to do so on the weekend, it is reasonable to assume that auctions ending on weekends are likely to receive higher attention and attract more bidders, which tends to lead to a higher winning bid due to an increase in the number of bidders as well as the probability of overbidding [Ku et al. 2006; Melnik and Alm 2005]. A number of studies have shown that weekend auctions tend to receive a higher price than weekday auctions after controlling for the number of bidders [Lucking-Reiley et al. forthcoming; Melnik and Alm 2005]. Therefore,

*H<sub>6</sub>: Auctions ending on a weekend tend to receive a higher price than those ending on a weekday.*

#### 2.7. Bidder Expertise

Studies on bidder expertise are extensive in traditional auctions, particularly in the experimental economics literature. Most often, these studies focus on how bidders may change their behavior as they gain more auction experience. A number of studies have shown that bidders behave in a manner that is more consistent with theoretical

predictions as they gain more experience through repeated play [Kagel and Levin 1986; Kagel and Richard 2001]. For example, Kagel and Levin [1986] find that inexperienced bidders are more likely to overbid, whereas experienced bidders are less likely to do so because of bidder exits and bid adjustments driven by learning [Cox et al. 2001]. Jeitschko [1997] also indicates that experienced bidders learn from previous winning bids and update their belief. This type of learning influences their bidding strategy in a way that they on average tend to place a lower bid than bidders who have no such experience or are unaware of this effect of information. Further, as indicated by Garratt et al. [2004], the effect of bidder expertise may still be underestimated by the experimental setting because bidders' learning is constrained by the limited duration of the auction.

Online auctions pose a unique problem to researchers. Bidders in traditional auctions are professionals who often bid for expensive items and are motivated to learn because of their profit-driven nature, whereas in online auctions, particularly consumer-to-consumer auctions, average consumers bid for common goods. Therefore, an interesting research question is whether non-professional bidders can improve their performance in online auctions as they become more experienced.

The answer to this question is positive, as prior studies have shown that increased experience can influence how bidders bid. For example, Wilcox [2000] indicates that experienced bidders are more likely than inexperienced bidders to bid in the last minute and place a single bid in the same auction. This bidding strategy reveals little information to other bidders, which can lead to a lower price. Dholakia et al. [2002] find that experienced bidders are less likely than inexperienced bidders to engage in herding behavior (i.e., a bidder's preference for participating in auctions with existing bids). They further indicate that the herding bias may lead to a high price and such bias decreases as bidders gain more experience but increases as the item quality becomes more difficult to judge.

Several other studies intend to test how bidder expertise may directly affect the auction price. For example, Livingston [2005] investigates auctions of golf clubs at eBay and reports that inexperienced bidders on average bid more than experienced bidders, but react less strongly to a seller's ratings. Similarly, Dewan and Hsu [2004], in their study of online stamp auctions, find that bidder expertise has a significantly negative effect on the final price of the auction.

Based on the above discussion, the following hypothesis can be formulated:

*H<sub>7</sub>: Experienced bidders on average tend to pay a lower price than inexperienced bidders.*

## 2.8. Seller Reputation

With the rapid growth of online auctions, an increasing number of transactions need to be completed between buyers and sellers who may have had little or no previous interaction with each other. This situation certainly brings risks to both buyers and sellers. In a typical consumer-to-consumer auction site (e.g., eBay), examples of risks are that sellers may not deliver the item auctioned, the item delivered may not be the same as it was described, buyers may not make the payment, and so on.

One way to reduce these potential risks is law enforcement. However, due to the high cost of establishing such law enforcement and the cost of enforcing a contract is high compared to the value of the transaction, there is no such law that regulates online auctioneers and bidders. Instead, major auction sites have developed a reputation mechanism intended to make up for the absence of law enforcement.

Though online reputation reporting systems vary across different sites, they all provide information about one party's previous transactions with other parties. Specifically, each of the major online auction listing sites provides a mechanism that allows buyers to rate and post comments about their experiences (e.g., delivery and the quality of the product) after doing business with a given seller. These comments are often grouped into positive, negative, and neutral feedbacks over a period of the past one, six, and twelve months. By browsing the ratings and comments, potential buyers can realize how credible a given seller was in the past.

A number of researchers have investigated the value of reputation in online auctions, particularly in eBay auctions. A regression analysis is usually performed to assess the effect of seller reputation on the final price of an auction. Mixed results are found in the literature. Some researchers indicate a small but statistically significant positive effect of reputation on price [Houser and Wooders 2006; Livingston 2005; Lucking-Reiley et al. forthcoming; Standifird 2001]. For example, Houser and Wooders [2006] find that in eBay's auctions of computer CPUs, an increase of positive ratings from zero to 15 will result in an increase in the final price by about 5%. Additionally, it is also found that eBay sellers' negative feedback has a stronger effect on price than their positive feedback [Lucking-Reiley et al. forthcoming].

Others, however, do not find a significant effect of reputation on price even with a large data set [Ariely and Simonson 2003; Brint 2003; Eaton 2002; Resnick and Zeckhauser 2000]. For example, Resnick and Zeckhauser [2000] find that seller feedback does not influence the auction price but does have an effect on the probability of a sale.

In an effort to reconcile these conflicting results, some researchers indicate that there may be other factors that increase or reduce the effect of reputation on price. For example, research has found that the effect of reputation is stronger when potential bidders are uncertain about the quality of the auction items [Dewally and Ederington 2006]. Bajari and Hortacsu [2004] also argue that the effect of reputation may be stronger for high-priced items than for low-priced items.

This study investigates a high-priced item with certain degree of quality uncertainty (e.g., some items are used). Therefore, it is expected that a seller with a good reputation is likely to receive a higher price. Formally,

*H<sub>8</sub>: Auctions with a more reputable seller tend to receive a higher price than those with a less reputable seller.*

### 3. Methodology

eBay was selected as the data source because of its dominant role in the online auction industry in both China and the US. eBay stores detailed records of completed auctions, which provide a source of real and high quality auction data. The 17- and 19-inch LCD monitors were chosen as the study object for the following reasons. First, LCD monitors are consumer electronics, which is one of the most popular product categories at eBay. Thus, this study focuses on a very competitive market with a lot of sellers and bidders. Second, LCD monitors are not a low-priced item. It is expected that bidders are serious about their bidding. Third, both 17- and 19-inch LCD monitors are collected due to the limited auction listings at eBay China.

Auction data were collected at eBay China and US during a one-month period from late September, 2006 to late October, 2006. The one-month period was chosen for two reasons. First, since the price of LCD monitors tends to be volatile, the data collection period should be as short as possible so as to minimize the market effect on the bidding price. Second, a reasonably large sample size was also expected. The one-month period satisfies both requirements.

At eBay China, all auctions of 17- and 19-inch LCD monitors were collected, whereas at eBay US, only DELL monitors were collected, considering the large number of available auctions. Specifically, on any given day, eBay China has about 120 auction listings of 17- and 19-inch LCD monitors, whereas that number is 1955 at eBay US.

The following information on each auction was collected: the total number of bids, the number of unique bidders in the same auction, the starting and ending dates and time, the starting bid, the reserve price if any, the BIN option if any, the ratings of sellers and winners, the condition and the size of the monitors (new vs. used and 17- vs. 19-inch), the number of pictures for the monitors, and the final price.

Overall, there were 263 single-item auctions at eBay China, with 246 auctions that received bids. At eBay US, 813 single-item auctions were collected, with 742 auctions that received bids. Considering that this study examines the determinants of the auction price, the final data set does not include auctions that have no bids. In other words, only 246 auctions at eBay China and 742 auctions at eBay US were considered.

Variables used in this study are labeled and defined in Table 1 and the summary statistics are given in Table 2.

Table 1: Variable Definitions

Variable	Definition
<i>Price</i>	The final price of the auction
<i>Starting Bid</i>	The amount of the starting bid
<i>Reserve</i>	Dummy variable indicating whether the auction has a reserve price (Reserve = 1) or not (Reserve = 0)
<i>BIN</i>	Dummy variable indicating whether the auction has a Buy-It-Now price (BIN = 1) or not (BIN = 0)
<i>Picture</i>	The number of pictures of the LCD monitor
<i>Length</i>	The length of the auction in days
<i>Weekend</i>	Dummy variable indicating whether the auction ends on Saturday or Sunday (Weekend = 1) or not (Weekend = 0)
<i>BEXP</i>	The number of a bidder's overall ratings
<i>POS</i>	The number of a seller's unique positive ratings
<i>NEG</i>	The number of a seller's unique negative ratings
<i>Bidders</i>	The number of unique bidders in the same auction
<i>NEW</i>	Dummy variable indicating whether the monitor is new (NEW = 1) or used (NEW = 0)
<i>19-inch</i>	Dummy variable indicating whether the monitor is 19- (19-inch = 1) or 17-inch (19-inch = 0)
<i>Shipping</i>	The amount of the shipping and handling fee

Table 2: Summary Statistics (China: N = 246; US: N = 742)

Variable	Country	Mean	Standard Deviation	Minimum	Maximum
Price	China	\$93.52	\$19.20	\$62.54	\$194.51
	US	\$151.81	\$32.37	\$78	\$255
Starting Bid	China	\$5.40	\$26.04	\$.13	\$191.45
	US	\$47.01	\$57.77	\$.01	\$220
Shipping	China	\$7.43	\$1.22	\$2.55	\$12.76
	US	\$31.43	\$10.43	\$0	\$85.86
Number of Bidders	China	12.25	4.792	1	27
	US	6.97	3.583	1	17
Seller's Positive Ratings	China	394.12	259.10	0	682
	US	1416.18	3813.46	0	24078
Seller's Negative Ratings	China	8.19	4.65	0	13
	US	14.84	55.02	0	579
Bidder's Overall Ratings	China	3.11	8.10	0	60
	US	255.25	1586.34	0	39620
Number of Pictures	China	4.38	3.13	0	27
	US	1.87	1.67	0	14
Length	China	8.26	3.98	3	14
	US	4.70	2.25	1	10
% Weekend	China	.24	-	-	-
	US	.29	-	-	-
% Reserve	China	.004	-	-	-
	US	.03	-	-	-
% BIN	China	.04	-	-	-
	US	.08	-	-	-
% New	China	.99	-	-	-
	US	.67	-	-	-
% 19-inch	China	.37	-	-	-
	US	.47	-	-	-

As can be seen from Table 2, there are several notable differences between the two sites. First, the used LCD monitors at eBay China only account for 1% of auctions that received bids, whereas that number is 33% at eBay US. This may suggest that Chinese consumers may not be comfortable selling and buying used goods without face-to-face meeting. Second, there is a large difference of users' ratings between eBay China and US, particularly for bidders' overall ratings. Third, there are more bidders per auction at eBay China than at eBay US (12.25 vs. 6.97, respectively). One explanation could be the relatively low starting bid at eBay China. Specifically, the average ratio of the starting bid to the final price at eBay China is 3.44%, whereas that figure is 31.51% at eBay US.

#### 4. Empirical Model Development

Based on the hypotheses developed in a previous section, the following generalized empirical model can be stated:

$$Price = f(\text{Starting Bid}, \text{Reserve}, \text{BIN}, \text{Picture}, \text{Length}, \text{Weekend}, \\ \text{Bidder Expertise}, \text{Seller Reputation}, \text{Control Variables})$$

Bidder expertise is measured as the number of a bidder's overall ratings (*BEXP*). Seller reputation is measured by two variables – the number of a seller's unique positive ratings (*POS*) and the number of a seller's unique negative ratings (*NEG*).

##### 4.1. Control Variables

For both eBay China and US auctions, the control variables include *Shipping*, *Bidders*, *New*, and *19-inch*. Prior research has shown that the number of bidders can have a positive influence on the auction price [Kamins et al. 2004; Kauffman and Wood 2006], while the shipping cost tends to have a negative effect on the final price as bidders often incorporate it when bidding [Melnik and Alm 2002]. It is also expected that new and 19-inch monitors will receive a higher price than used and 17-inch ones, respectively.

4.2. Adjustment for Nonlinear Relationships

This study assumes that nonlinear relationships exist between the dependent and independent variables. Specifically, researchers have suggested that there is a nonlinear relationship between auction users' ratings (e.g., a bidder's ratings and a seller's positive and negative ratings) and the auction price [Houser and Wooders 2006; Lucking-Reiley et al. forthcoming]. Therefore, a logarithmic transformation is implemented.

The final empirical model for eBay China and US auctions is shown as follows:

$$Price = \alpha + \beta_1(Starting\ Bid) + \beta_2Reserve + \beta_3BIN + \beta_4Picture + \beta_5Length + \beta_6Weekend + \beta_7Ln(1 + BEXP) + \beta_8Ln(1 + POS) + \beta_9Ln(1 + NEG) + \beta_{10}Bidders + \beta_{11}Shipping + \beta_{12}New + \beta_{13}19\text{-inch} + \varepsilon$$

Note that 1 is added to bidders' overall ratings as well as sellers' positive and negative ratings in case of zero ratings.

5. Empirical Results

Ordinary least square method (OLS) was used to estimate the above regression model and the results are given in Table 3.

Table 3: Regression Results

Predictor Variable	eBay China		eBay US	
	Standardized Coefficient	t	Standardized Coefficient	t
Starting Bid	.977**	12.295	.264**	8.124
Reserve	-.088*	-2.351	-.084**	-3.897
BIN	-.219**	-3.117	-.055*	-2.292
Picture	.232**	4.558	.033	1.470
Length	.008	.184	.003	.126
Weekend	-.037	-1.046	.064**	2.995
Ln(1+BEXP)	.002	.040	-.065**	-3.049
Ln(1+POS)	.323*	2.42	.103**	3.089
Ln(1+NEG)	-.543**	-4.377	-.122**	-3.648
Bidders	.155**	3.631	.234**	7.148
Shipping	.101	2.089	-.213**	-9.469
NEW	.114**	2.859	.223**	9.089
19-inch	.313**	6.176	.651**	27.771
Observations	246		742	
R <sup>2</sup>	.726		.676	
Adjusted R <sup>2</sup>	.711		.670	

Dependent Variable: Price; \*\*:  $p < .01$ ; \*:  $p < .05$

Hypothesis 1 tests the effect of the starting bid on the auction price. As can be seen from Table 3, the starting bid has a significantly positive effect on price at both eBay China and US, suggesting the higher the starting bid, the higher the auction price. Thus, hypothesis 1 is supported.

Hypotheses 2 and 3 assume that a reserve price and BIN have a positive effect on price. Results in Table 3 demonstrate that they both have a significantly negative effect on price at eBay China and US. Therefore, hypotheses 2 and 3 are both rejected.

Hypothesis 4 expects a higher price as the number of pictures increases. This relationship, as shown in Table 3, is only significant at eBay China.

Hypotheses 5 and 6 test the effect of the auction ending date (weekend vs. weekday) and length on price. Regression results indicate that only eBay US auctions ending on the weekend receive a higher price, while the auction length has no significant effect on price at both eBay China and US.

Hypothesis 7 suggests that experienced bidders pay a lower price than inexperienced bidders. As seen in Table 3, this hypothesis is only supported at eBay US. Hypothesis 8 tests the effect of seller reputation on price. Results in Table 3 show similar patterns across eBay China and US auctions. Specifically, sellers' positive ratings have a positive effect on price, whereas their negative ratings have a negative effect on price. Therefore, hypothesis 8 is supported.

The summary of results is provided in Table 4.

Table 4: Summary of Results

Hypothesis	Predictor Variable	Anticipated Effect on Price	eBay China	eBay US
H <sub>1</sub>	Starting bid	Positive	Supported	Supported
H <sub>2</sub>	Reserve Price	Positive	Rejected	Rejected
H <sub>3</sub>	Buy-It-Now	Positive	Rejected	Rejected
H <sub>4</sub>	Product Picture	Positive	Supported	Rejected
H <sub>5</sub>	Auction length	Positive	Rejected	Rejected
H <sub>6</sub>	Weekend	Positive	Rejected	Supported
H <sub>7</sub>	Bidder expertise	Negative	Rejected	Supported
H <sub>8</sub>	Sellers' positive ratings	Positive	Supported	Supported
H <sub>8</sub>	Sellers' negative ratings	Negative	Supported	Supported

This section closes with several other observations on the results. First, the shipping cost has a significantly negative effect on price only for US auctions. The reason why this effect does not exist at eBay China may be because the shipping fee at eBay China only accounts for a rather small percentage of the auction price (7.94%), whereas that number is 20.7% at eBay US. Second, the number of bidders has a significantly positive effect on price at both eBay China and US, suggesting that bidders may experience auction fever in the bidding and ultimately bid more than they had originally intended. Third, as expected, product characteristics (i.e., new vs. used and size) have a strong impact on the final price.

## 6. Discussion

Overall, this study finds moderately good results for the application of online auction theories developed in the US to a different national and cultural context (i.e., China). Specifically, both the starting bid and seller reputation drive up price, though their effect size and relative importance vary between the two cultures. This study also finds that several factors (e.g., picture and bidder expertise) have different effects across the two cultures. This section shall further discuss these elements, especially the differences across nations.

### 6.1. Starting Bid

The starting bid has a significantly positive effect on price for both eBay China and US auctions. This finding suggests that the starting bid may universally serve as a quality indicator for potential bidders; a high starting bid indicates a high quality item, which eventually leads to a high price.

It should be noted that the magnitude of the effect seems to vary. At eBay China, the starting bid has the greatest impact on price ( $\beta = .977$ ). For eBay US auctions, while the starting bid is the second most important factor (behind the monitor size), the effect size is relatively small ( $\beta = .264$ ). A further analysis indicates that a high starting bid discourages bidder entry at eBay US, whereas bidders at eBay China are more willing to attend auctions with a high starting bid. In other words, a high starting bid at eBay China not only serves as a quality indicator but also helps build bidding momentum, which may be the reason why the starting bid at eBay China has a stronger effect on price.

### 6.2. Reserve Price and Buy-It-Now

A reserve price has a significantly negative effect on price at both eBay China and US. This finding should be taken with caution. First, very few auctions have a reserve price in the sample (1 at eBay China and 23 at eBay US), which may bias the results. Second, the negative effect may result from potential bidders' unwillingness to participate in auctions with a reserve price [Bajari and Hortacsu 2003], thus leading to fewer bidders, which in turn decreases the auction price. For example, at eBay US, 23 auctions with a reserve price have an average starting bid of \$18.5 and the average number of bidders per auction is 6.7, whereas for auctions without a reserve price, those figures are \$47.9 and 7, respectively. This result indicates that sellers tend to set up a low starting bid for auctions with a reserve price, but the low starting bid does not attract bidders because of their reluctance to attend auctions with a reserve price.

A BIN price provides a retailing option for bidders who can obtain the auction item immediately without going through the bidding process. Results in Table 3 show that a BIN price has a significantly negative effect on price at both eBay China and US. Specifically, at eBay China, there are 9 auctions with a BIN price, and 3 of them sold for the BIN price, while those figures at eBay US are 59 and 23, respectively. There are two possible reasons behind the negative effect of a BIN price. First, for auctions ending with BIN, sellers may set up a conservative BIN price, while the winning bids often exceed the BIN price because of the competitive nature of online auctions as well as the highly competitive market (i.e., LCD monitors) under investigation. Second, bidders are reluctant to attend



auctions with a BIN price. For example, at eBay China, for auctions with a BIN price but ending with a bid, the average number of bidders per auction is 4, whereas this number is 12.6 for auctions without a BIN price. These two figures are 3.6 and 7.3 at eBay US, respectively. Therefore, the lack of bidding may be responsible in part for the lower price of auctions with a BIN price.

### 6.3. Product Picture

This study finds that the number of product pictures has a significantly positive effect on price only for eBay China auctions. Two possible explanations exist for this finding. First, as indicated by Milgrom and Weber [1982], information revelation (e.g., providing pictures) drives up price only when potential bidders are uncertain about the value of the auction item. At eBay US, this study investigates a well-known brand (DELL) where most bidders may not have a problem with their valuations. However, monitors at eBay China are mostly generic brands and tend to vary in quality. Thus, it is reasonable to assume that more pictures at eBay China help bidders reduce their uncertainty, while a reduced uncertainty can lead to an increase in price [Milgrom and Weber 1982; Yin 2005].

Second, from a cultural perspective, prior research has shown that Chinese value risk aversion, while Americans tend to be risk seekers [Hofstede 1980; Zhou et al. 2002]. Risk-averse consumers actively search for product information to reduce their uncertainty [Grewal et al. 1994] and often infer product quality from available cues when lacking information [Zhou et al. 2002]. As compared to the US market where product information is abundant (e.g., company website, consumer reports, etc.), the amount of information is far more limited in China, where the market is less efficient and thereby product pictures can serve as an important information cue; more pictures can be interpreted as an indicator of high quality, which often commands a high price.

### 6.4. Auction Ending Date and Length

Monitors sold on Saturday or Sunday command a higher price at eBay US. This result is consistent with the literature [Melnik and Alm 2005]. For eBay China auctions, however, this effect does not exist. A further analysis indicates that auctions ending on Monday or Tuesday generate a higher price at eBay China. Two possible explanations may exist: the ending time of the auction (morning, noon, or evening) and fluctuations in daily supply may be responsible for price changes. After controlling for both factors, however, Monday and Tuesday auctions still receive a higher price at eBay China. Future research may want to examine this issue.

The auction length has no significant effect on price at both eBay China and US. This result is different from those of Dewally and Ederington [2006] and Lucking-Reiley et al. [forthcoming], who find a significantly positive effect of the auction length on price. One possible explanation is that they examine more heterogeneous items (i.e., comic books and coins minted in different years), where the length of the auction tends to have a greater effect because only a few similar and/or identical items are available at one time [Melnik and Alm 2002]. In contrast, LCD monitors are common and homogenous goods, and bidders often have more options at any point of time. As a consequence, the auction ending date seems more important than how long an auction lasts, a finding which has been confirmed in the present study.

### 6.5. Bidder Expertise

This study finds that more experienced bidders pay a lower price than less experienced bidders at eBay US, whereas this effect does not exist at eBay China. One explanation is that Chinese bidders overall have little experience. Specifically, among 246 auction winners at eBay China, 147 of them have zero ratings, 30 of them have a rating of 1, and the highest rating is 60. In contrast, among 742 auction winners at eBay US, only 14 of them have zero ratings and the highest rating is 39620. Therefore, very little variation in the number of bidder ratings at eBay China may be the reason why bidder expertise has no significant effect on price.

### 6.6. Seller Reputation

This study confirms that seller reputation plays an important role in online auctions across cultural contexts. This finding is expected considering the nature of online auctions (i.e., trading with strangers and physical separation between sellers and buyers). This result is also consistent with past research showing that the value of seller reputation in the online shopping environment seems to be universal among cultures [Jarvenpaa and Tractinsky 1999; Pavlou and Chai 2002; Teo and Liu 2007].

Seller reputation, especially a seller's negative ratings ( $\beta = -.543$ ), is the second most important element driving price at eBay China. While a good reputation at eBay US also drives up price, its relative importance and effect size ( $\beta = -.122$  for negative ratings) decrease.

Cultural differences may explain the stronger effect of seller reputation at eBay China. For example, Chinese consumers are more likely to favor doing business with individuals with whom they are familiar [Samiee 1998], and past research has also shown that collectivists (e.g., Chinese) are less likely to trust others as compared to individualists (e.g., Americans) [Yamagishi and Yamagishi 1994]. In addition, according to a survey conducted by iResearch in 2006 [[www.iresearch.com.cn](http://www.iresearch.com.cn)], seller credibility is a major reason why some Chinese consumers never shop online, a problem that becomes even greater in consumer-to-consumer online auctions such as eBay.

Consequently, when dealing with strangers in online auctions in China, bidders often scrutinize sellers' past performance (i.e., feedbacks), which thereby becomes more important even than product characteristics (i.e., the condition and size of the monitor).

## 7. Conclusions

The present study applies online auction theories developed in the US to a different national and cultural context (i.e., China). After summarizing and comparing factors that drive price across online auctions in China and the US, this study is able to identify similarities and differences. Specifically, the starting bid and seller reputation have been shown to have similar effects on price, though the magnitude of the effect varies among cultures. The number of product pictures has a significantly positive effect on price only for eBay China auctions, while the opposite is true for bidder expertise and auctions ending on the weekend. These differences are further explained from cultural and institutional perspectives.

The results of this study have important implications for auction sellers and bidders as well as online retailers in general. From auction sellers' perspective, understanding the price determinants helps them design their auctions. For example, by realizing that a BIN price negatively affects the auction price in a competitive market at eBay China and US, sellers may want to ignore this feature or set up a relatively high BIN price. From bidders' perspective, this study can help them improve their bidding performance. For example, it would be better for potential bidders at eBay China to participate in an auction that has a low starting bid and/or a Buy-It-Now price.

Considering this study focuses on homogenous goods in a highly competitive market with a lot of sellers and bidders, findings from this study can be generalized to similar competitive markets. Examples include, but are not limited to, other consumer electronics (e.g., personal computers, digital cameras, and MP3 players) and popular collectors' items (e.g., homogenous coins and stamps). Findings from this study, however, may not be generalized to a less competitive market with fewer traders as well as heterogeneous goods (e.g., furniture and rare antiques).

One limitation of this study is related to the auction items under investigation. Because of the large number of listings at eBay US as well as the limited auction listings at eBay China for the same product category, this study selects DELL LCD monitors at eBay US and all auctions of LCD monitors at eBay China. Though they both are homogeneous goods and very comparable to each other, DELL monitors are well known and tend to have a relatively higher degree of homogeneity. This type of difference may have some effect on the findings.

Given the differences identified in this study, additional work is needed to confirm the existence and variations of these differences in different national and cultural contexts with different types of auction items (e.g., homogeneous vs. heterogeneous, consumer goods vs. collectors' items, high-price vs. low-price items, etc.) in different markets (competitive vs. less competitive). The present study is only the first step in furthering the understanding of price determinants in online auctions across cultural contexts.

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