

**AN EMPIRICAL ANALYSIS OF FACTORS AFFECTING THE BIDDING
COMPETITION IN AN ONLINE AUCTION:
A COMPARISON BETWEEN ENGLISH AND BUY-IT-NOW AUCTIONS**

Kevin K.W. Ho
School of Business and Public Administration
University of Guam
UOG Station, Mangilao, GU 96923
kevinkho@triton.uog.edu

Byungjoon Yoo
College of Business Administration
Seoul National University
1 Gwanak-ro, Gwanak-gu, Seoul 08826, Korea
byoo@snu.ac.kr

Seunghee Yu
School of Business
Sejong University
209 Neungdong-ro, Gwangjin-Gu, Seoul 05006, Korea
shyu@sejong.ac.kr

ABSTRACT

We examine the factors affecting the bidding competition in the online auction environment in this study. We propose a conceptual model to explain how information, including the reputation records of sellers and product quality, affects the level of competition in an online bidding environment. To test our model, digital camera auction data have been collected from eBay and Yahoo! auction websites and analyzed using the multiple regression method. We have found that the influence of factors is depending on the auction mechanisms. While the positive and the non-positive peer evaluation records of a seller have an influence on the level of bidding competition in the English and the BIN auction formats, their impacts are opposite: The positive peer evaluation records have a positive impact in the English auction, but a negative impact in the BIN auction; and negative peer evaluation records have a negative impact in the English auction, but a positive impact in the BIN auction. Plus, the provision of warranty has a negative impact in the BIN auction. This result helps electronic commerce practitioners to gain a better understanding of the bidders' behavior and helps them to develop better business strategies in the electronic marketplace.

Keywords: Electronic marketplace; Buy-It-Now (BIN) auction, eBay; Yahoo! Auction; Bidding competition; Electronic auction.

1. Introduction

Information Systems (IS) researchers have been studying the properties of the electronic marketplace for more than two decades [Bakos 1997; Bapna et al. 2001; Bapna et al. 2004; Easley et al. 2011; Kauffman & Wood 2006; Lee 1998; Malone et al. 1987; Wolf & Muhanna 2011]. While early studies in this area focus on developing the theoretical frameworks of the electronic marketplace [Malone et al. 1987], the majority of the recent studies are empirical or analytical studies that use eBay and other electronic auction websites as test beds for the research models developed by IS researchers [Walczak et al. 2006]. This research focuses on studying the bidders-sellers dynamics in the context of Business-to-Consumer (B2C) and Consumer-to-Consumer (C2C) electronic auctions. As shown in the recent literature, IS researchers are interested in gaining a better understanding of the services provided by the electronic marketplace. Services like the provision of peer evaluation records of bidders and sellers [Dellarocas 2003; 2005], and the auction mechanisms, such as Buy-It-Now (BIN) auction format [Yoo et al. 2006], developed by the electronic marketplace.

The above-mentioned new auction mechanisms and new services are designed to enhance the efficiency of the electronic marketplace by reducing the information asymmetry problem [Akerlof 1970]. The provision of the peer

evaluation records of the auction participants in the electronic marketplace, for example, is one of the services designed to enhance the trust between bidders and sellers [Ba & Pavlou 2002; Dellarocas 2003]. Prior studies show that the positive peer evaluation records of a seller can enhance the trust between sellers and bidders, leading to an increase in the closing price of the electronic auction concerned. On the contrary, the negative peer evaluation records of a seller can reduce the trust among sellers and bidders, resulting in a decrease of the closing price of the electronic auction concerned [Ba & Pavlou 2002; Lee et al. 2000; Pavlou & Dimoke 2006; Yoo et al. 2006].

Some prior studies examine the impact of the auction format on the efficiency of an auction by investigating its impact on the closing price of electronic auctions. Yoo et al. [2006] suggest that the BIN auction format improves the efficiency of the electronic auction. The BIN auction format allows a seller and a bidder to close an electronic auction earlier when the bidder agrees to close the auction by using the BIN Price (P_{BIN}) proposed by the seller at the outset of the BIN auction. Prior studies also show that the closing price of a BIN auction is higher than the closing price of an English auction with identical conditions [Budish & Takeyama 2001; Hidvégi et al. 2006; Mathews 2004; Reynolds & Wooders 2009; Standifird et al. 2004; Wong et al. 2008; Yoo et al. 2006]. Yoo et al. [2006] suggest that the increase of the closing price of the BIN auction format is due to the additional information provided to the bidder through the P_{BIN} , which reduces the negative impact of information asymmetry, and in turn results in higher revenue to sellers.

As the BIN auction format generates a higher revenue to sellers, it is expected that sellers would prefer to use this auction format in the electronic marketplace, however, Ho et al. [2007] show that it is not necessarily the case. Ho et al. [2007] show that the cultural background of a seller and the types of product auctioned are significant factors affecting a seller's decision on whether she would use the BIN auction format in the electronic marketplace. However, there is a paucity of prior study focused on studying real-life scenario *in situ*, in which a bidder has a wide range of similar type of products for selection in the electronic marketplace auctioned by sellers with different backgrounds (such as different levels of reputation) and in different auction formats (i.e., the English auction format vs. the BIN auction format). In the seller's perspective, their primary aim is to sell the item in the electronic marketplace at a higher price and with a lower cost. As suggested by the analytical and empirical research studies mentioned above, BIN auction would allow the seller to sell the item at a higher price than the English auction and usually in a shorter period of time if one of the bidders agrees the P_{BIN} and directly purchases the item using it. If bidders treat the English auction and the BIN auction indifferently, it is obvious that all sellers should use the BIN auction format to sell their items. However, if bidders treat the English auction and BIN auction differently based on the background of the sellers as well as the product specifications, it will be in the interest of the sellers to know whether their background and the product that they are selling are suitable for using the BIN auction format.

Therefore, the aim of this study is to conduct an empirical investigation using the completed auction data (i.e., those electronic auctions, which have been transacted) to study whether factors, such as the reputation of a seller (as reflected by the peer evaluation records of the seller) and the product profile (as reflected by whether it has warranty coverage, a new or a used item, and its price-level compared with other similar products), would have a correlation with the level of auction competition. In particular, we are interested in investigating whether the auction format used (i.e., English auction vs. BIN auction) would have an impact on the level of competition in the election auction as measured by the number of bids submitted in the auction competition. We choose the number of bids submitted in the auction competition as our dependent variable in this study because it shows the level of competition of the auction. Plus, it is the proxy of the number of bidders participating in the bidding competition. In this study, we only look into the completed auctions, as these are the auctions which have been transacted. Therefore, by examining the completed auctions, we would be able to find out some insights on whether bidders have different behaviors in participating in BIN or English auctions, as measured by the level of auction competition (i.e., the number of bids submitted) in the field environment. To sum up, we are interested in the following two research questions:-

- (1) *How the seller's profile affects the level of auction competition in the two different electronic auction formats?*
- (2) *How the product profile affects the level of auction competition in the two different electronic auction formats?*

This paper is organized as follows. In Section 2, we review prior studies in electronic auction and BIN auction research. Then, we introduce our conceptual model and develop our hypotheses in Section 3. In Section 4, we report how we collect our data and conduct our data analysis. In Section 5, we discuss the results, the contributions and future extension of this study. Then, we conclude the paper in Section 6.

2. Literature Review

The electronic marketplaces, especially the B2B electronic marketplaces, have been established for more than twenty years. The first major study on the B2B electronic marketplace is conducted by Lee [1997; 1998] back in the late 1990s. In his study, he uses AUCNET, the Japanese Used Cars electronic marketplace, as an example to analyze

the problem of information asymmetry on the B2B electronic marketplace. He shows that with some suitably designed mechanisms, the negative effect of information asymmetry can be reduced. As a result, sellers of used car in AUCNET gain more revenue compared to sellers in the brick-and-mortar used car marketplaces. Bakos [1997] studies the reduction of search cost of buyers in the electronic marketplace and predicts the keen competition of sellers the electronic marketplace industry.

To reduce the negative effect of information asymmetry and build up the trust among members of the electronic marketplace communities (i.e., bidders and buyers), most electronic marketplace websites provide a peer evaluation system to reflect the trustworthiness of their members [Dellarocas 2003; Rice 2012]. Prior research investigates whether the peer evaluation records of a seller in these systems can bring a significant impact on the closing price of the electronic auction. The results of these studies show that while positive peer evaluation records of a seller generate a positive impact on the closing price of an electronic auction, negative peer evaluation records of a seller generate a negative impact [Ba & Pavlou 2002; Lee et al. 2000; Yoo et al. 2006]. Plus, Dellarocas [2005] shows the relationship between the peer evaluation records of a seller and the pure moral hazard. Wolf and Muhanna [2011] further investigate this issue and use the peer evaluation systems of eBay and Amazon to show that the format of peer evaluation report in different electronic marketplace websites have a different level of impact on the institutional-based trust of consumers towards the respective electronic marketplace websites.

There are other research studies that investigate how peer evaluation records of a seller reduce the impact of the possibility to face an Internet auction fraud in the electronic marketplace and build up the trust between a bidder and a seller. Hu et al. [2004] study the Escrow service and its impact on the trust building in the electronic marketplace. MacInnes et al. [2005] propose a conceptual model to examine factors affecting the likelihood of disputes in eBay. Gregg and Scott [2006] study the impact of the use of the peer evaluation reputation system for reducing the Internet auction fraud in the electronic marketplace. They show that the reputation profile of a seller in the peer evaluation system can help a bidder to predict the probability of facing an Internet auction fraud in the electronic marketplace. Other studies also show that the text comments embedded with the peer evaluation profiles of a seller have an impact on the trust building in the electronic marketplace, i.e., positive text comments can increase the trust between bidders and seller. The increase in trust between the bidders and sellers can bring a price premium on electronic auction [Pavlou & Dimoke 2006].

Apart from building up the trust among bidders and sellers, new auction mechanisms have been developed to improve the efficiency of the electronic auction. The BIN auction format is one of the most successful mechanisms developed. eBay [2012] reported in its 2011 Annual Report that the members of its community welcomed this auction mechanism and around 63% of the auctions completed on eBay in 2011 were in the BIN auction format. There are two formats of BIN auction in the electronic marketplace, i.e., the Buy Now auction format developed by Yahoo! auction in 1999 and the BIN auction format developed by eBay. For Yahoo's Buy Now auction format, a P_{BIN} proposed by a seller is available throughout an auction competition and is effectively the highest possible closing prices of that electronic auction. On the other hand, the P_{BIN} proposed by a seller in eBay's BIN auction format is only available at the opening of the BIN auction. In this paper, we use the terms "eBay's BIN auction format" and "Yahoo's Buy Now auction format" to distinguish these two formats of BIN auction when it is necessary.

While most prior studies in BIN auction are analytical studies [Budish & Takeyama 2001; Hidvégi et al. 2006, Mathews 2004; Reynolds & Wooders 2009], there are also empirical and experimental studies conducted in a BIN auction using electronic marketplace websites as test beds [for example, Hou 2007; Standifird et al. 2004; Yoo et al. 2006]. The results of these analytical and empirical research studies show that the BIN auction in both eBay and Yahoo formats generate more revenue compared with their equivalent English auction counterpart.

Another stream of IS research studies in electronic marketplace examines how product attributes and product quality affect the closing price of an electronic auction. Kauffman and Wood [2006] show that product attributes such as product price, provision of warranty, etc., have significant impacts on the closing price of an electronic auction. Lee et al. [2000] and Yoo et al. [2006] have also shown that the quality of the product has an impact on the closing price of an electronic auction, i.e., the closing price of an electronic auction of used and/or refurbished product is lower than the closing price of an electronic auction of the same, but brand new product.

IS researchers are also interested in understanding the similarities and dissimilarities of B2C and C2C electronic auctions, and other factors affecting the success of the electronic auction market [Oh 2002]. Stafford and Stern [2002] conduct a survey to study the relationship between the background of consumers and their attitude towards their participation in an electronic auction. The study shows that consumers who have a higher level of technology acceptance, with a higher involvement with electronic auctions, and a higher affinity for computers are more readily to accept and participate in an electronic auction. In another study, Stern and Stafford [2006] use path analysis to examine the determinants of the winning bid in electronic auctions. Anwar et al. [2006] study the bidders' cross-bidding behavior (i.e., purchase an item via bidding in more than one electronic auction listings of the similar types

of items) and noted that bidders would be able to pay for a lower price on average if bidders cross-bid. Plus, Easley et al. [2011] report that there is a correlation between the bidding pattern, bidders' experience and the Winner's Curse.

To sum up, one key focus of research in the electronic marketplace is to find out the methods to reduce the negative effect of information asymmetry. Even though electronic marketplace websites have developed some trust-building mechanisms, such as the peer evaluation system, to reduce the negative effect of information asymmetry, this problem still exists. Therefore, other new mechanisms are developed or under developing to build up the trust among the auction participants. Another important focus of research in the electronic marketplace is to investigate the special property of the BIN auction format.

3. Development of the Conceptual Model and Hypotheses

Based on the results reported in the prior literature, we conjecture that the seller's background (i.e., peer evaluation records of a seller), and product profile of the item auctioned (i.e., product attributes, product quality and the price of the product) would affect the level of competition in an online auction. We conjecture the seller's background and the product profile would have impacts on the level of competition, and the impacts are moderated by the auction format chosen (i.e., English auction vs. BIN auction).

3.1. Impact of Seller's Profile: the Peer Evaluation Records of a Seller

Yoo et al. [2006] propose that the provision of additional information in the electronic marketplace, such as the peer evaluation records of a seller, can reduce the negative impact of information asymmetry. We conjecture that the peer evaluation records can affect the level of competition in both the English and the BIN auctions. As reported by Lee et al. [2000], Ba and Pavlou [2002] and Yoo et al. [2006], positive peer evaluation records and negative peer evaluation records of a seller can increase and decrease the closing prices of an electronic auction, respectively. Other studies show that the trust between a bidder and a seller can be built-up by the positive peer evaluation records of a seller [Ba & Pavlou 2002; Hu et al. 2004; Gregg & Scott 2006; MacInnes et al. 2005].

In this study, we conjecture the peer evaluation records would have different impacts on the level of competition in the two formats of the electronic auction. First, the positive peer evaluation records will help bidders and sellers to build-up trust between them [Ba & Pavlou 2002; Hu et al. 2004; Gregg & Scott 2006; MacInnes et al. 2005]. As the trust between bidders and sellers has built-up, it will encourage more bidders to participate in that electronic auction. As more bidders are participated in that auction, we would expect the level of competition will increase. However, the effect of the increase in the level of competition would be different for an online English auction and an online BIN auction. As suggested by Shunda [2009], when a bidder participates in a BIN auction, the bidder would need to use the P_{BIN} and the reserve price listed in the BIN auction to formulate her reference price for that auction. As the P_{BIN} in a BIN auction is proposed by a seller, the trustworthiness of the seller has an impact on a bidder's perception on whether the P_{BIN} proposed is reasonable or not. This will affect the process of formulating the reference price for the auction. If the bidders are of the view that the seller is trustworthy, they will be more likely to participate in the BIN auction. Such participation includes submitting bids in the bidding competition and using the P_{BIN} to purchase the item. Therefore, when we compare two BIN auctions, which are identical except having different levels of seller's reputation, we conjecture bidders would be more likely to purchase the item in the BIN auction if the seller has a better reputation, i.e., having more positive peer evaluation records. This situation, on the other hand, will decrease the number of bids observed in the bidding competition as the bidding time is cut short. In other words, more positive peer evaluation records of the seller in an online BIN auction would reduce the number of bids, *ceteris paribus*. When we compare the number of bids submitted in a completed online English auction and a completed online BIN auction with identical condition, we will observe that the number of bids of the English auction would be more than the BIN auction.

For the negative peer evaluation records, we conjecture its effect would be opposite to the effect of the positive reputation records. First, as negative peer evaluation records will reduce the trust between a bidder and a seller, it would reduce the level of competition in an online auction. The reduced level of competition in an online English auction will decrease the number of bids observed. However, for an online BIN auction, the reduced level of competition will increase the bidding time, resulting an increase of the number of bids observed. Here, we predict a trade-off between the benefit of the extra information provided by the P_{BIN} in formulating of reference price in the BIN auction (which makes it more attractive to the bidder due to the reduction of information asymmetry [Akerlof 1970]) and the reliability of the information (which the information from a bidder with poor reputation may be misleading). Therefore, we conjecture the number of bidders who opt to purchase an item using BIN auction will drop as the negative reputation records of the sellers increase due to the trade-off mentioned above. Thus, the time available for auction competition will increase. As a result, a large number of negative peer evaluation records in an online BIN auction would increase the number of bids, *ceteris paribus*. As presented in prior literature, the reputation of a seller is reflected by the number of positive and negative peer evaluation records of a seller. In addition, as the number of peer evaluation records is usually large, we anticipate that such impacts would have a diminishing return. Therefore,

we use the natural logarithmic value of these reputation records as our independent variables. Here, we developed the first two sets of hypotheses as follows.

H1a: *The level of competition of an online English auction (as measured by the number of bids) increases when the logarithmic value of the number of positive peer evaluation records of a seller increases.*

H1b: *The level of competition an online BIN auction (as measured by the number of bids) decreases when the logarithmic value of the number of positive peer evaluation records of a seller increases.*

H2a: *The level of competition of an online English auction (as measured by the number of bids) decreases when the logarithmic value of the number of non-positive (i.e., the sum of neutral and negative) peer evaluation records of a seller increases.*

H2b: *The level of competition of an online BIN auction (as measured by the number of bids) increases when the logarithmic value of the number of non-positive peer evaluation records of a seller increases.*

In our model, we consider neutral peer evaluation records are non-positive records. Dellarocas [2003] suggests that most users treat neutral comments as non-positive comments as there are an overwhelming number of positive peer evaluation records in the electronic marketplace. Therefore, we use the non-positive records (i.e., the sum of negative and neutral peer evaluations) in H2a and H2b.

3.2. Impact of the Product Profile: Provision of Warranty to the Product Auctioned

Kauffman and Wood [2006] observe that items with warranty have a higher closing price in an electronic auction. Boulding and Kirmani [1993] also suggest that the provision of warranty of a product reduces the uncertainty level of the product quality. When a seller agrees to provide warranty for the product that she has auctioned in the electronic marketplace, the warranty reduces the uncertainty of the product quality. Obviously, the provision of warranty becomes an extra piece of information, which increases the value of the product. Therefore, it is obvious that bidders would be more likely to purchase an item covered by warranty in the electronic marketplace compared to an item without warranty. As a result, we conjecture the provision of warranty would increase the attractiveness of the item, and would increase the level of competition of an online English auction, i.e., increase the number of bids.

While a bidder would be more likely to increase the level of competition of an auction for a product with warranty, we conjecture the provision of warranty in an online BIN auction would reduce the number of bids. As reported by Dimoka and Pavlou [2008], the provision of warranty and the provision of P_{BIN} in an auction can reduce the product uncertainty, and the nature of the warranty would have an impact on the bidder decision to participate in a BIN auction [Chen et al. 2014]. As the nature of the warranty has been proved to have an impact on a bidder's decision to use in a BIN auction or not, we conjecture the provision of warranty encourages a bidder to buy the item directly in the BIN auction resulting in a reduction of time available for bidding, and in turn, a reduction of the number of bids observed in the bidding competition. Therefore, we have the next set of hypotheses as follows.

H3a: *The level of competition of an online English auction (as measured by the number of bids) increases when the item auctioned is covered by warranty.*

H3b: *The level of competition of an online BIN auction (as measured by the number of bids) decreases when the item auctioned is covered by warranty.*

3.3. Impact of Product Profile: Used/Refurbished Products

While the provision of warranty of the product auctioned reduces the uncertainty of the product quality [Dimoka & Pavlou 2008], the label of a used and/or refurbished product increases its uncertainty [Bland et al. 2007]. Lee et al. [2000] and Yoo et al. [2006] report that the closing price of an electronic auction is lower for a used and/or a refurbished product as the bidder has a higher level of uncertainty about the product quality and reduces their valuation on the product auctioned. It is obvious that the disclosure of an item as a used/refurbished item is a piece of information, which decreases the value of the product. Therefore, bidders would be less likely to bid for a used/refurbished item compared with a new item. In the setting of online English auction, this will lead to a decrease of the number of bids.

However, the situation for BIN auction would be different from English Auction. Prior research [Rougeris and Androulakis 2008; Wu et al. 2007] suggests that bidders would have a negative perception on their valuation of the auction if the items involved are used/refurbished. We conjecture the status of a used/refurbished item would discourage bidders to buy the item directly using the P_{BIN} in an online BIN auction [Shunda 2009], and increases the time available for bidding in the BIN auction, resulting in an increase in the number of bids. Therefore, we have the following two hypotheses.

H4a: *The level of competition of an online English auction (as measured by the number of bids) decreases for a used and/or a refurbished product.*

H4b: *The level of competition of an online BIN auction (as measured by the number of bids) increases for a used and/or a refurbished product.*

3.4. Impact of Product Profile: Price Level of the Product Auctioned

Kauffman and Wood [2006] observe that the price of the product auctioned has an impact on the closing price of an electronic auction in the electronic marketplace. When the price of the item auctioned is higher, the bidder would perceive that she is exposed to a higher default risk in the Internet auction [Hu et al. 2004]. Hence, the trust between a bidder and a seller is negatively associated with the price of products. Therefore, we conjecture the level of bidding competition in an online auction would reduce when the price of the product auctioned increases. In the case of an online English auction, the decrease of trust will lead to a decrease in the level of bidding competition and resulting in reducing the number of bids.

However, as the bidder needs to rely on the P_{BIN} to formulate the reference price in the BIN auction [Shunda 2009], we anticipate that the higher risk associated with the auction of an expensive product will reduce her willingness to purchase the item using the BIN auction. This will lead to the increase of the time for bidding compared with an identical BIN auction of a product with a lower price level. The increase of the bidding time will increase the number of bids. Hence, we have the following two hypotheses.

H5a: *The level of competition of an online English auction (as measured by the number of bids) decreases when the price level of the item auctioned increases.*

H5b: *The level of competition of an online BIN auction (as measured by the number of bids) increases when the price level of the item auctioned increases.*

3.5. Other Variables: Auction Format and Website Issue

There are two more variables included in our conceptual model, i.e., the auction format (i.e., English auction vs. BIN auction), and the website (i.e., whether the data is collected from eBay or Yahoo! auction). As prior research has shown that the auction format used would have an impact on the bidders' behavior, it makes the auction format becoming a natural choice as a moderator in our conceptual model. In our analysis, we treat the cases as a BIN auction if that auction is first listed as a BIN auction, no matter if the bidder wins the auction by using the P_{BIN} to purchase the item or to win the item by submitting the final bid in the bidding competition. Bidders who participate in a BIN auction would know the format of the auction, and somehow would be prepared to use the P_{BIN} to make the purchase when it is necessary. More importantly, the bidders already used the P_{BIN} in their bidding decision process [Shunda 2009]. We code this dummy variable as follows: whether an item is transacted using an English auction (=0) or using a BIN auction (=1).

Our second variable is a control variable for the source of the data, i.e., whether the data is collected from eBay or Yahoo! auction. As discussed in the prior literature, the Yahoo's Buy Now auction format and the eBay's BIN auction format have different levels of impact on the efficiency of BIN auction [Reynolds & Wooders 2009; Yoo et al. 2006]. This difference would have an impact on the formation of bidding strategy of bidders. In addition, these two websites have different designs, which may have an impact on the bidders' interaction with the website. Therefore, it is appropriate to include the data source as a control variable.

Figure 1 shows our conceptual model and the relationships of the hypotheses proposed.

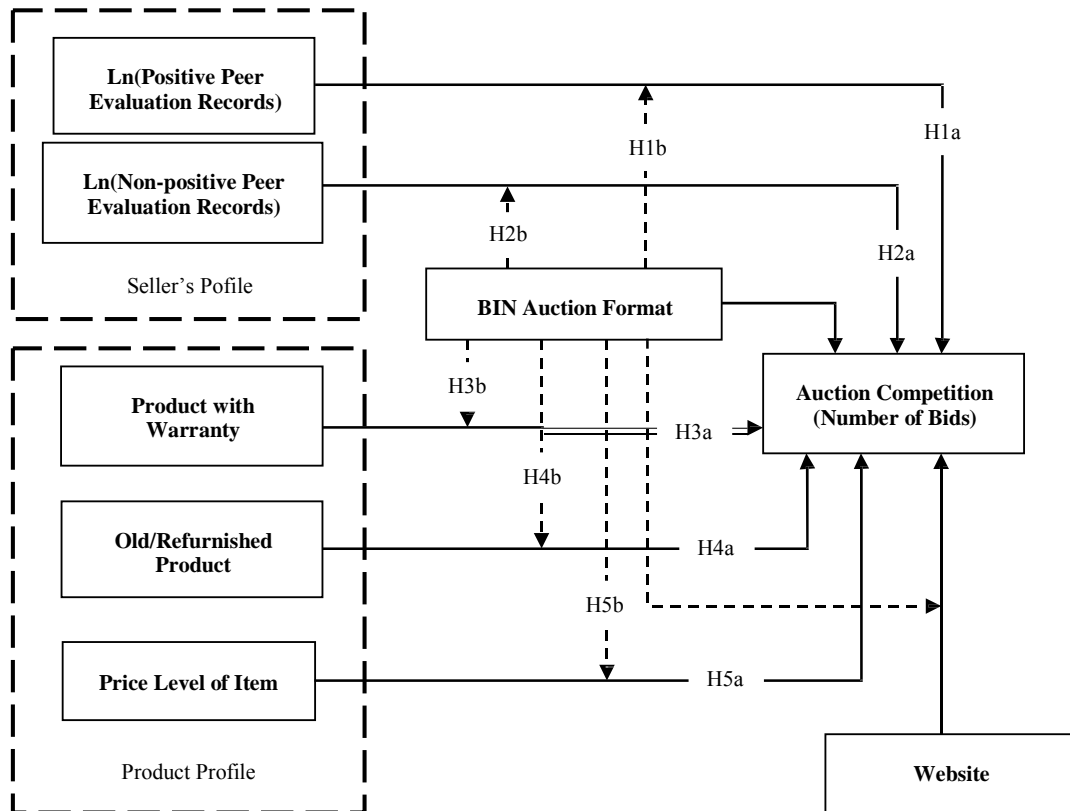


Figure 1: Conceptual Model and Hypotheses

4. Data Collection and Data Analysis

4.1. Data Collection

To test the hypotheses proposed in Section 3, we collect electronic auction data from the archives of two different electronic marketplaces, i.e., eBay and Yahoo! auction, for our data analysis. We choose digital camera products with resolution with 2.00 to 3.99 mega pixels (MPixels) as the product category to be investigated in this study as this type of products is a quasi-commodity product [Figueiredo 2000]. As suggested by Figueiredo [2000], bidders can understand the features of a quasi-commodity product more readily from the description provided in the electronic marketplace websites. During the period that we collected our data, digital cameras with 2.00 to 3.99 MPixels were mature products and bidders were able to understand their properties well enough. A total of 328 and 113 auction records are retrieved from the archives of eBay and Yahoo! auction, respectively. For each completed auction record, we record down the auction information of the winning bids, such as the model of the camera, closing price of electronic auction, the P_{BIN} posted, shipping cost, and the peer reputation records of the sellers, etc., by copying the webpage into an MS Word file. The models of digital cameras auctioned at eBay and Yahoo! auction are highly similar. Table 1 summarizes the descriptive statistics of our dataset.

In this study, we use the price ratio, i.e., the ratio of the price of the product auctioned compared with the average price of the same category of product, as the proxy of the price level of the digital cameras auctioned. We first collect the online prices of those digital cameras concerned from shopping agent websites, such as Shopping.com (<http://www.shopping.com>) and MySimon.com (<http://www.mysimon.com>). The online price (including shipping and handling costs and taxation) of digital cameras was calculated as the average of the second highest and the second lowest price found by these shopping agents. This method could minimize the effect of extreme values collected by shopping agents. The price ratios of digital camera are calculated by dividing the online prices by the average Internet price of digital cameras with the same resolution (i.e., 2.00-2.99 MPixels and 3.00-3.99 MPixels). The average Internet prices of digital cameras of 2.00-2.99 MPixels and 3.00-3.99 MPixels are US\$213.73 and US\$242.06, respectively. Thus, the corresponding range of price ratios of 2.00-2.99 MPixels and 3.00-3.99 MPixels are 0.46 to 3.18, and 0.34 to 2.27, respectively. In this research, we calculate the price ratio of the two categories of digital cameras separately. It is because both eBay and Yahoo! auction websites categorized the digital camera auctions based on different ranges

of MPixels (i.e., 2.00-2.99 MPixels, 3.00-3.99 MPixels, 4.00-4.99 MPixels, etc.). In particular, the ranges of 2.00-2.99 MPixels and 3.00-3.99 MPixels are the two categories of mature digital camera products which bidders understood their properties well. Therefore, when a bidder wants to select a group of digital camera auctions for consideration, she is likely to select the digital cameras using either one of the two groups provided by the auction websites to reduce the number of auctions for selection. Therefore, the bidder is likely to compare the price of the digital cameras within similar MPixels. As a result, we are of the view that the use of price ratios as the proxy of the price level of digital cameras allows us to examine the impact of the price level of a digital camera with different resolutions more precisely.

Table 1: Descriptive Statistics

Description	eBay (N =328)	Yahoo! (N = 113)	Total (N = 441)	
Camera Resolution				
2.00 -2.99 Mpixels	210 (64%)	47 (42%)	257 (58%)	
3.00-3.99 Mpixels	118 (36%)	66 (58%)	184 (42%)	
Product Quality: Brand New Product vs. A Used and/or Refurbished Product				
Brand New Product	231 (70%)	54 (48%)	285 (65%)	
A Used and/or a Refurbished Product	97 (30%)	59 (52%)	156 (35%)	
Product Quality: Warranty				
Product with Warranty	151 (46%)	62 (55%)	213 (48%)	
Product without Warranty	177 (54%)	51 (45%)	228 (52%)	
Price Level of Product / Price Ratio				
2.00-2.99 MPixels	Lowest Ratio	0.48	0.46	0.46
	Highest Ratio	3.18	1.98	3.18
3.00-3.99 MPixels	Lowest Ratio	0.35	0.34	0.34
	Highest Ratio	2.27	1.88	2.27
Auction Format				
Buy-It-Now Auction	102 (31%)	76 (67%)	178 (40%)	
English Auction	226 (69%)	37 (33%)	263 (60%)	

4.2. Data Analysis

To investigate the hypotheses proposed in the previous section, we conduct multiple regression analyses based on our conceptual model to analyze our data collected. Here, we develop two regression equations to study for the main effect and the moderating effect, as follow.

$$BIDS = A + B_1 \ln(G + 1) + B_2 \ln(NB + 1) + B_3 \text{Warranty} + B_4 \text{Used} + B_5 \text{\$Ratio} + B_6 \text{eBay} + B_7 \text{BIN} \dots (1)$$

$$BIDS = A + B_1 \ln(G + 1) + B_2 \ln(NB + 1) + B_3 \text{Warranty} + B_4 \text{Used} + B_5 \text{\$Ratio} + B_6 \text{eBay} + B_7 \text{BIN} + B_8 \ln(G + 1) \times \text{BIN} + B_9 \ln(NB + 1) \times \text{BIN} + B_{10} \text{Warranty} \times \text{BIN} + B_{11} \text{Used} \times \text{BIN} + B_{12} \text{\$Ratio} \times \text{BIN} + B_{13} \text{eBay} \times \text{BIN} \dots (2)$$

The notations used in the multiple regression analyses are summarized in Table 2 and the results of the multiple regression analysis are presented in Table 3. The diagnostic checks confirm that there is no multicollinearity problem in this dataset.

By comparing the regression results of the main effect and the moderating effect, we note that $\ln(G+1)$ has a significant positive impact and a significant negative impact on the level of competition as measured by the number of bids in online English auction and BIN auction, respectively. This result supports our H1a and H1b. Plus, we note the support for our H2a and H2b, i.e., $\ln(NB+1)$ has a significant negative impact and a significant positive impact on the level of competition as measured by the number of bids in online English auction and BIN auction. Lastly, the

provision of warranty also reduces the level of competition as measured by the number of bids in the online BIN auction, which supports H3b.

Table 2: Notations used in the Multiple Regression Analysis

Notation	Definition
BIDS	The total number of bids of the auction competition, which is the dependent variable in our model.
Ln(G+1)	The natural logarithmic value of the total number of positive peer evaluation records of a seller plus one (i.e., G+1). We use G+1 in this calculation to avoid taking the logarithmic value of cases which G = 0.
Ln(NB+1)	The natural logarithmic value of the total number of non-positive (i.e., the sum of neutral and negative) peer evaluation records of a seller plus one (i.e., NB+1). We use NB+1 in this calculation to avoid taking the logarithmic value of cases which NB = 0.
WARRANTY	A dummy variable for coding whether the digital camera auctioned has a warranty (0: No warranty; 1: product auctioned is covered by warranty).
USED	A dummy variable for coding whether the digital camera auctioned is a brand new or a used/refurbished camera (0: Brand new digital camera; 1: Used / refurbished digital camera).
\$Ratio	The price ratio is the ratio of the average online price of a digital camera compared with the average price of digital cameras within the same range of resolution.
BIN	A dummy variable coding for the auction format (0: English auction; 1: BIN auction).
eBay	A dummy variable for coding whether the auction data is collected from eBay or from Yahoo! auction (0: data collected from Yahoo! auction; 1: data collected from eBay).

Table 3: Multiple Regression Analyses for the Main Effect and the Moderating Effect

Variable	Main Result		Moderating Effect	
	Coefficient	t-value	Coefficient	t-value
Ln(G+1) (H1a)	0.3715	1.213	1.968 ***	4.940
Ln(NB+1) (H2a)	-0.04386	-0.1110	-1.891 ***	-3.784
WARRANTY (H3a)	0.8049	0.7475	2.155	1.782
USED (H4a)	0.2260	0.1925	-0.5119	-0.3482
\$Ratio (H5a)	1.721	1.585	2.518	1.898
eBay	-1.272	-1.001	-3.232	-1.928
BIN	-6.680 ***	-6.898	1.516	0.4223
Ln(G+1)×BIN (H1b)	-	-	-3.590 ***	-5.926
Ln(NB+1)×BIN (H2b)	-	-	4.379 ***	5.357
WARRANTY×BIN (H3b)	-	-	-6.584 **	-2.746
USED×BIN (H4b)	-	-	-2.569	-1.030
\$Ratio×BIN (H5b)	-	-	-0.09125	-0.04209
eBay×BIN	-	-	7.086 **	2.832
Constant	10.49 ***	5.539	7.308 **	3.050
R ²	0.1303		0.2167	
R ² (adj.)	0.1163		0.1928	
F-value	9.271 ***		9.085 ***	
Note: *** significant at p < 0.001; ** significant at p < 0.01; * significant at p < 0.05.				

5. Discussion

5.1. Factors affecting the level of bidding competition of online auctions

In Section 3 we develop our conceptual model to investigate into the factors affecting the level of bidding competition in the online English auction and the online BIN auction. We conjecture the dynamics in the bidding competition will be opposite to each other because of the differences in the nature of these two types of online auction. In brief, we conjecture the level of competition as measured by the number of bids in an online English auction will

increase when (i) the seller has a high amount of positive evaluation records (i.e., H1a) and a small amount of non-positive evaluation records (i.e., H2a), (ii) the product is covered by warranty (i.e., H3a), new (i.e., H4a) and having a low price-level (i.e., H5a). However, we conjecture the same set of profile will decrease the level of competition as measured by the number of bids in an online BIN auction. The major reason that we hypothesize that these factors would have an opposite effect is due to the difference between the auction mechanisms of the English and the BIN auctions. For the English auction, as the time of the auction is fixed, the positive factors (such as positive evaluation records, inclusion of warranty, new product, low price-level) will be able to attract more bidders to participate in the bidding competition. The increased number of bidders will lead to an increase of the number of bids of the online auction. However, the situation of the BIN auction is different. While the positive factors would still help to attract more people to bid (and thus, it will somehow lead to an increase of the number of bids), the effect will be offset by the increase of the chance that one of the bidders would agree to purchase the auction item immediately, which will shorten the time of available for bidding and reduce the number of bids.

Based on the data collected from eBay and Yahoo! auction, we perform two multiple regression analyses. The results provide empirical support on H1a and H1b, H2a and H2b, and H3b. Thus, it is suggested that the major factors in the online English auction are the seller reputation profiles, and the major factors affecting the online BIN auction are seller's reputation profiles and the provision of warranty.

In the case of online English auction, it is in the benefit of the sellers that there are more bidders involved in the bidding competition. It is because if the bidding competition is fierce (as reflected by an increase of the number of bids), the final closing price of the auction would increase and thus, it will increase the revenue of the seller. Based on the result of this study, it would mean that the reputation of the seller is the sole factor which affects the intensity of the bidding competition.

However, for the case of BIN auction, the situation is different. Usually, sellers use BIN auction when they want to sell an item at a fixed price (i.e., the P_{BIN}) as soon as possible. Therefore, it is for the benefit of the seller to sell the item quickly, which is reflected by the decrease of the number of bids. In this situation, apart from the reputation of the seller has an impact (i.e., the better the profile, the fewer the number of bids, and the more quickly the item is being sold), another important factor is to provide warranty to the product. Probably, the provision of warranty would enhance the trust between the seller and bidders and encourage the bidder to directly purchase the item using the P_{BIN} set by the seller.

In this study, we also note the provision of warranty would not have a significant positive impact on the number of bids in the online English auction. This suggests that the provision of warranty or not in an online English auction would not have a significant impact on its level of competition, and therefore, H3a is not supported.

We also observe that the quality of product (i.e., whether the item is a new item or a used/refurbished item) and the price level (as measured by the price ratio) of the product do not have a significant impact on the level of competition (as measured by the number of bids) in the online English and BIN auctions, which suggests that H4a/H4b and H5a/H5b are all not supported. These results may arise from the fact that the digital camera is a quasi-commodity product [Figueiredo 2000] and the prices of the digital cameras auctioned in these marketplaces are relatively inexpensive. Plus, as digital camera products have a relative short product-life cycle driven by the Moore's Law [Myhrvold 2006], it is likely that the bidders are intended to use that digital cameras as a commodity and would replace them in a short period of time. Thus, the bidders do not concern about whether the digital cameras are new or used/refurbished product (as they only plan to use these cameras for a short period of time, and leading to the insignificant results of H4a/H4b) and are insensitive to the price level of these digital cameras (and resulting in the insignificant results of H5a/H5b).

We also observe some interesting results related to one of our control variables, i.e., website (eBay vs. Yahoo! auction). We note that the level of competition is moderated by the auction format to a certain extent. In the case of online English auction, the difference between the levels of competition is insignificant. However, for the case of BIN auction, the eBay's BIN auction format would attract more bids compared with Yahoo's Buy Now auction. One of the possible explanations of this observation is related to the differences in the BIN auction mechanism between these two websites. As discussed, the P_{BIN} of Yahoo! Buy Now auction would be available through the whole auction competition, whereas the P_{BIN} of eBay BIN auction would only be available at the beginning stage of the BIN auction. After a bid submitted higher than the reservation price of the auction, the eBay BIN auction would convert back into a regular English auction (even though the P_{BIN} would be found in the description of the auction, but it would not be available for the bidder to use it to purchase the item). This may extend the average time of bidding competition for the eBay's BIN auction compared with Yahoo's Buy Now auction, and leading to an increase in the number of bids in eBay's cases. As a related issue, as we observe the statistically insignificant result between the number of bids in online English auction in eBay and Yahoo! websites, we would suggest that the impact of the website in general

(excluding the BIN feature) between the two websites may not have a significant impact on the bidding behavior of the bidders.

5.2. Theoretical Contributions and Managerial Implications

This study contributes to the theory of IS research, and in particular, electronic auction research by filling the gap in the existing electronic auction research, which needs more thoughtful investigation into the factors affecting the level of bidding competition in the English and BIN auctions. While prior studies have usually focused on the factors affecting the final price of the auction, this study looks into the issue in a different angle. We look into how a set of factors increase the bidding competition in an English auction, and why the same set of factors would reduce the bidding competition in a BIN auction. As prior studies report that the two BIN auction formats increase the efficiency of electronic auction [Reynolds & Wooders 2009], it is important for researchers to gain more understanding of all the factors affecting the bidding competition as well. The key findings of this study provide empirical evidence to show that the key factors affecting the bidding competition in an English auction are the reputation profiles of the seller, and the product profile does not have much impact. However, for the BIN auction, some product profile, i.e., warranty coverage, would have an impact on the level of bidding competition. We conjecture that the trust between the seller and the bidder is increased due to the provision of the warranty coverage, and encourages the bidder to purchase the item using the P_{BIN} .

The findings from this study also have several important managerial implications. First, the findings reinforce the importance of maintaining an excellent overall reputation profile for the sellers, i.e., they should maintain a high level of positive reputation records and minimize the non-positive reputation records. In this case, when the sellers participate in an English auction, their records can attract more people to bid on their products, which can increase the bidding competition and will be likely to bring a higher final price of the auction. Plus, their reputation records would also encourage bidders to make a direct purchase decision in the BIN auction. This is crucial for the sellers as most of the bidders nowadays will cross-bid in the electronic marketplaces [Anwar et al. 2006]. If the sellers have an excellent overall reputation profile, they can attract more bidders to bid on their auctions and increase their revenue. Another important managerial implication is the importance of providing warranty for products auctioned at BIN auction. This can encourage the bidders be more readily using the P_{BIN} in the BIN auctions, and will improve their revenue [Reynolds & Wooders 2009].

5.3. Limitation of this Research

Similar to other research studies, our study has some limitations. First, due to the slim transaction volume in the Yahoo! auction, we can only collect a small number of data from the archives of Yahoo! auction. In particular, we cannot obtain sufficient field data to perform similar analysis for other types of products. Indeed, digital camera auctions were the most active auction categories in the Yahoo! auction. However, its transaction volume was still slim compared with the transaction volume of most types of products on eBay. Therefore, we can perform our analysis only using a single type of product. In addition, as the data used in this study are field data collected from the eBay and the Yahoo! auction websites, we cannot control the demographic background of the auction participants (i.e., the gender type, age, education background, income level, computer literacy level, etc., of bidders and sellers, as well as the product auctioned in this study) and thus, we have a limited choice of potential factors and control variables to be included in our regression models. Indeed, we have already included all the important factors and control variables, which are available in both eBay and Yahoo! auction websites into our regression models. In addition, we cannot single out the difference in the design of the eBay and Yahoo! auction websites, which may have some impacts on the responses of the bidders. Therefore, it is possible that the difference of demographic background of the auction participants, the differences in the design of these two auction platforms, and the products auctioned in the two websites do not fully account for in our regression analyses. However, we are of the view that such effects should be minimal because the participants of both electronic marketplace websites are coming from all over the world, and thus, the difference of the demographic background and the impacts of the differences in the design of these two auction platforms were minimal. Plus, as mentioned in Section 4.1, we have already checked the models of digital camera auctioned in eBay and Yahoo! auction at that time and we note that the models of digital cameras auctioned in these websites are very similar. In addition, the non-significant result of the impact of the website on the level of bidding competition as measured by the number of bids reflects that the effect of the differences in the design of the website and the demographic background would probably be minimal. Therefore, the potential differences of the product auctioned in these two electronic marketplace websites should not bring any significant impact to our result.

5.4. Future Research Direction

For future research direction, we propose to conduct laboratory experiments and empirical studies in order to further probe into the impacts of information as a set of factors affecting the bidding competition in electronic auction and E-commerce. With data to be collected from laboratory and field experiments in eBay, we shall be able to examine this issue across different categories of goods, as well as the impact of the BIN auction designs. This can help

researchers to gain more insight into the factors affecting the adoption of E-commerce, and to provide useful insight that may help practitioners to improve their design of website and attract more buyers into the higher-revenue generation mechanism, such as BIN auction format, in the electronic marketplace.

6. Conclusion

In this study, we investigate how different factors affect the bidding competition in electronic auctions. Using field data collected from two different electronic marketplace websites, we use multiple regression analysis to show that information provided in the websites, such as positive and non-positive peer evaluation records, affect the bidding competition in both online English and BIN auctions. Plus, the provision of warranty of the product also has a significant impact on the bidding competition in BIN auction. The result of this study, as explained, has both theoretical contributions to IS and E-commerce research, and managerial implications for the electronic marketplace industry.

Acknowledgement

Byungjoon Yoo thanks the Management Research Center at the Seoul National University for grant funding. The authors also want to thank the editor, associate editor, and the anonymous reviewers for their insightful comments and suggestions that led to a much improved manuscript.

REFERENCES

- Akerlof, G.A., "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," *Quarterly Journal of Economics*, Vol. 84, No. 3, pp. 480–500, 1970.
- Anwar, S., McMillan R. and Zheng, M., "Bidding Behavior in Competing Auctions: Evidence from eBay," *European Economic Review*, Vol. 50, No. 2, pp. 307–322, 2006.
- Ba, S. and Pavlou P.A., "Evidence of the Effect of Trust Building Technology in Electronic Markets: Price Premiums and Buyer Behavior," *MIS Quarterly*, Vol. 26, No. 3, pp. 243–268, 2002.
- Bakos, J.Y., "Reducing Buyer Search Costs: Implications for Electronic Marketplaces," *Management Science* Vol. 43, No. 12, pp. 1676–1692, 1997.
- Bapna, R., Goes, P. and Gupta, A., "Insights and Analyses of Online Auctions," *Communications of the ACM* Vol. 44, No. 11, pp. 42–50, 2001.
- Bapna, R., Goes, P., Gupta, A. and Jin, Y., "Using Heterogeneity and its Impact on Electronic Auction Market Design: An empirical Exploration," *MIS Quarterly*, Vol. 28, No. 1, pp.21–43, 2004.
- Bland, E.M., Black, G.S. and Lawrimore, K., "Risk-Reducing and Risk-Enhancing Factors Impacting Online Auction Outcomes: Empirical Evidence from eBay auctions," *Journal of Electronic Commerce Research*, Vol. 8, No. 4, pp. 236–243, 2007.
- Boulding, W. and Kirmani, A., "A Consumer-side Experimental Examination of Signaling Theory: Do Consumers Perceive Warranties as Signals of Quality?" *Journal of Consumer Research*, Vol. 20, No. 1, pp. 111–123, 1993.
- Budish, E.B. and Takeyama, L.N., "Buy Price in Online Auctions: Irrationality on the Internet?" *Economic Letters* Vol. 72, No. 3, pp. 325–333, 2001.
- Chen, K.-P., Lai, H.-P. and Yu, Y.-T. "Do Consumer Discount Parallel Imports?," *Asia-Pacific Journal of Accounting & Economics*, Vol. 21, No. 1, pp. 58–77, 2014.
- Dellarocas, C., "The Digitization of Word of Mouth: Promise and Challenge of Online Feedback Mechanisms," *Management Science*, Vol. 49, No. 10, pp. 1407–1424, 2003.
- Dellarocas, C., "Reputation Mechanism Design in Online Trading Environments with Pure Moral Hazard," *Information Systems Research*, Vol. 16, No. 2, pp. 209–230, 2005.
- Dimoka, A. and Pavlou, P.A., "Understanding and Mitigating Product Uncertainty in Online Auction Marketplaces," *2008 Industry Studies Annual Conference*, Boston, MA, 2008.
- Easley, R.F., Wood, C.A. and Barkataki, S., "Bidding Patterns, Experience, and avoiding the Winner's Curse in Online Auctions," *Journal of Management Information Systems*, Vol. 27, No. 3, pp. 241–268, 2011.
- eBay, *2011 Annual Report / Form 10-K*, San Jose: eBay Inc., 2012.
- Figueiredo, J.M. de, "Finding Sustainable Profitability in Electronic Auctions," *Sloan Management Review*, Vol. 41, No. 4, pp. 41–52, 2000.
- Gregg, D.G. and Scott, J.E., "The Role of Reputation Systems in Reducing On-line Auction Fraud," *International Journal of Electronic Commerce*, Vol. 10, No. 3, pp. 95–120, 2006.
- Hidvégi, Z., Wang, W. and Whinston, A.B., "Buy-price English Auction," *Journal of Economic Theory*, Vol. 129, No. 1, pp. 31–57, 2006.

- Ho, K.K.W., Yoo, B., Yu, S. and Tam, K.Y., "The Effect of Culture and Product Categories on the Level of Use of Buy-It-Now (BIN) Auctions by Sellers," *Journal of Global Information Management*, Vol. 15, No. 4, pp. 1–19, 2007.
- Hou, J., "Price Determinants in online auctions: A comparative study of eBay China and US," *Journal of Electronic Commerce Research*, Vol. 8, No. 3, pp. 172–183, 2007.
- Hu, X., Lin, Z., Whinston, A.B. and Zhang, H., "Hope of Hype: On the viability of Escrow services as trusted third parties in online auction environments," *Information Systems Research*, Vol. 15, No. 3, pp. 236–249, 2004.
- Jackson, M.O. and Kremer, I., "The relevance of a Choice of Auction Format in a Competitive Environment," *Review of Economic Studies*, Vol. 73, No. 4, pp. 961–981, 2006.
- Kauffman, R.J. and Wood, C.A., "Doing their bidding: An empirical examination of factors that affect a buyer's utility in Internet auctions," *Information Technology and Management*, Vol. 7, No. 3, pp. 171–190, 2006.
- Lee, H.C., "AUCNET: Electronic Intermediary for Used-Car Transactions," *Electronic Markets*, Vol. 7, No. 4, pp. 24–28, 1997.
- Lee, H.C., "Do Electronic Marketplaces lower the price of goods?" *Communications of the ACM*, Vol. 41, No. 1, pp. 73–80, 1998.
- Lee, Z., Im, I. and Lee, S., "The Effect of Negative Buyer Feedback on Auction Prices in the Internet Market," *Proceedings of the 21st International Conference on Information Systems*, Brisbane, Australia, pp. 286–287, 2000.
- MacInnes, I., Li, Y. and Yurcik, W., "Reputation and Dispute in eBay Transactions," *International Journal of Electronic Commerce*, Vol. 10, No. 1, pp. 27–54, 2005.
- Malone, T.W., Yates, J. and Benjamin, R.I., "Electronic Markets and Electronic Hierarchies," *Communications of the ACM*, Vol. 30, No. 6, pp. 484–497, 1987.
- Mathews, T., "The Impact of Discounting on an Auction with a Buyout option: A Theoretical Analysis motivated by eBay's Buy-It-Now Feature," *Journal of Economics*, Vol. 81, No. 1, pp. 25–52, 2004.
- Myhrvold, N., "Moore's Law Corollary: Pixel Power," *The New York Times*, June 6, 2006.
- Oh, W., "C2C verse B2C: A comparison of the Winner's Curse in two types of electronic auctions," *International Journal of Electronic Commerce*, Vol. 6, No. 4, pp. 115–138, 2002.
- Pavlou, P.A. and Dimoke, A., "The Nature and Role of Feedback Text Comments in Online Marketplaces: Implications for Trust Building, Price Premiums, and Seller Differentiation," *Information Systems Research*, Vol. 17, No. 4, pp. 392–414, 2006.
- Reynolds, S.S. and Wooders, J., "Auction with a Buy Price," *Economic Theory*, Vol. 38, No. 1, pp. 9–39, 2009.
- Rice, S.C., "Reputation and Uncertainty in Online Markets: An Experimental Study," *Information Systems Research*, Vol. 23, No. 2, pp. 436–452, 2012.
- Rougeris, C. and Androulakis, G.S., "An Examination of Factors affecting Bidders' Choice in Electronic Auctions," *Proceedings of the International Multiconference on Computer Science and Information Technology*, pp. 407–413, 2008.
- Shunda, N., "Auctions with a Buy Price: The Case of Reference-Dependent Preference," *Games and Economic Behavior*, Vol. 67, No. 2, pp. 645–664, 2009.
- Standifird, S.S., Roelofs, M.R. and Durham, Y., "The Impact of eBay's Buy-It-Now Function on Bidder Behaviour," *International Journal of Electronic Commerce*, Vol. 9, No. 2, pp. 167–176, 2004.
- Stafford, M.R. and Stern, B., "Consumer Bidding Behaviour on Internet Auction Sites," *International Journal of Electronic Commerce*, Vol. 7, No. 1, pp. 135–150, 2002.
- Stern, B.B. and Stafford, M.R., "Individual and Social Determinants of Winning Bids in Online Auctions," *Journal of Consumer Behaviour*, Vol. 5, No. 1, pp. 43–55, 2006.
- Walczak, S., Gregg, D.G. and Berrenberg, J.L., "Market Decision making for online auction sellers: Profit Maximization or Socialization," *Journal of Electronic Commerce Research*, Vol. 7, No. 4, pp. 199–220, 2006.
- Wang, X., Montgomery, A. and Srinivasan, K., "When Auction meets Fixed Price: A Theoretical and Empirical Examination of Buy-It-Now Auctions," *Quantitative Marketing and Economics*, Vol. 6, No. 4, pp. 339–370, 2008.
- Wolf, J.R. and Muhanna, W.A., "Feedback Mechanism, Judgment Bias, and Trust Formation in Online Auctions," *Decision Sciences*, Vol. 42, No. 1, pp. 43–68, 2011.
- Wu, Y.-L., Tao, Y.-H. and C.-C. Wu, "Critical Success Factors for Online C2C Auction Websites - A Consumer's Perspective," *WSEAS International Conference*, Hangzhou, China, 2007.
- Yoo, B., Ho, K. and Tam, K.Y., "The Impact of Information in Electronic Auctions: An Analysis of Buy-It-Now Auction," *Proceedings of the 39th Hawaii International Conference on Systems Sciences*, Hawaii, USA, 2006.