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# EFFECTIVENESS OF SELLER CREDIBILITY SYSTEMS ON ON-LINE PURCHASING AUCTIONS

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## **Introduction**

Despite the efficiency benefits that firms realize from electronic transactions, an important factor may be sacrificed with the new purchasing media, trust. The question of trust is more serious an issue in the open network environment due to the fact that sellers and buyers never meet each other prior to engaging in transactions. Asymmetric information whereby one party (Generally the seller) possesses more product information than the buyer, adds to the seriousness of the trust issue. Major auction sites, such as [www.ebay.com](http://www.ebay.com), have introduced credibility systems constructed through buyer feedback as a signal to buyers. This research is designed to improve how credibility systems can improve the efficiency of electronic transaction systems.

## **Literature Review**

Purchasing through Internet auctions has greater information asymmetries than traditional transactions because current electronic marketplaces allow sellers to remain anonymous and to easily change identities. Buyers must rely on the seller's description of a product and ability to deliver the product as promised (Kauffman and Wood, working paper).

Asymmetric information leads opportunism, where the market participants who are better informed benefits at the expense of the participants with less information. The type of opportunistic behavior related to auctions may be referred to as "adverse selection". Adverse selection is the opportunistic behavior characterized by an informed person benefiting from trading or otherwise contracting with a less informed person who is not aware of an unobserved characteristics of the informed person (Micro-economics, J.M.Perloff). The car market for "Lemons" is one of the most famous examples of how asymmetric information can break havoc on a market leading to the dominance of inferior products (Akerloff, 1970). Asymmetric information causes a competitive market to lose its desirable efficiency and desirable welfare properties. Klein and Leffler (1981) developed an analytical model that shows how opportunistic behavior will occur if the profit from misleading customers is greater than potential profits due to reputation effects. Shapiro (1982) discussed how product quality is reduced if a buyer cannot fully and accurately evaluate the product in a seller-controlled market. This may be an especially big problem with on-line purchasing, since with on-line auctions, the seller controls information by selectively posting and describing product quality to buyers. Some media analysts actually attribute lower than expected e-commerce growth to low levels of trust among participants (Rankin 1999).

A credibility system constructed from feedback is a low cost system to deal with asymmetric information issue. In recent research, Kauffman and Wood (2000) found coins auctioned on-line sold at only 47% of the price suggested by Coin World, reflecting the lower than expected prices paid by buyers. Ba and Pavlou (2002) demonstrated that appropriate feedback mechanisms could induce credibility without repeated interactions between two transacting parties. However, both of these papers focused exclusively on Business-to-Consumer (B2C) auctions. In this proposal, we intended to improve on the methodology of previous research and test the effectiveness of credibility systems using both B2C and B2B auctions.

## **Research Question, Methodology and Data Collection**

### ***Research Question***

On-line purchasing is subject to quality uncertainty, identity uncertainty and contract uncertainty (Jing Lu, 1997). Expansion of on-line purchasing would be facilitated by a system that promoted trust and reduced uncertainties due to asymmetric information.

Signaling and consumer screening are two methods suggested in previous studies, as ways to promote trust and credibility. A feedback credibility system is basically a signaling system that allows sellers to attract positive feedback, which can be used as a signal to future buyers. Buyers screen sellers by monitoring feedback. Dishonest sellers who receive negative feedback may be driven out of the market. However, the effectiveness of feedback systems is questionable since the identity of those issuing the feedback is difficult to discern. Another signaling method that sellers use is warranty programs. Any product that is covered by a valid US warranty (if the product is being sold in the US) implies a means of redress the product malfunctions. These warranty programs are often offered by original manufacturers, which are often established, well-known, on-goings concerns.

If either one or both of the two signaling methods are effective, buyers may be able to differentiate opportunistic sellers from good sellers or be more assured of product quality. Sellers that display superior feedback and/or provide a valid warranty for their product may be able to enjoy higher demand and price premia. The test of returns to feedback and warranty programs is implicitly a test of the effectiveness of the signaling methods. Questions addressed include: Does positive feedback lead to higher price? Does positive feedback lead to greater number of bids? Do warranty program lead to higher price? Do warranty program lead to greater number of bids? Or do the problems with feedback systems nullify the positive effects on price and demand? Do buyers trust sellers who provide valid warranty information or does warranty information have no effect on prices and demand?

### **Methodology**

This research will consist of two parts. In the first part an analytical model will be constructed. Models will be built to explain the incentives to provide feedback, incentive for sellers to take advantage of buyers under the conditions of asymmetric information and effectiveness of the signaling. The second part of the research will consist of empirical tests of the model using data collected from on-line auctions.

The return to honest sellers and/or to higher quality product can be measured by ending price premia and number of bids (Kauffman and Wood, 2000 and Ba and Pavlou, 2002). A working paper by Livingston (2002) also suggested likelihood of bidding, where an auction with no bids is differentiated from an auction that did generate bids. We add the length it takes for the auction price to converge to final price as an additional measure of the efficiency of the auction. Regression analysis will be used to test the model as described as below:

$$E = f(S, C)$$

*Measure of effectiveness (E) can be developed as follows:*

*Ending Price:  $E_p$  (the higher, the better)*

*Number of Bids:  $E_n$  (the more, the better)*

*Likelihood of Bidding:  $E_l$  (Either bids or no bids on an auction)*

*Converging Time:  $E_c$  (the shorter time, the better)*

*Signal Tools:  $S$ , there are two tools that will be examined*

*Credibility:  $S_c$  (measured by positive feedback and negative feedback, where negative feedback is an indication of lack of credibility)*

*Warranty:  $S_w$  (a positive signal if a warranty is offered)*

*Controls:  $C$ , these are required to control for variance in effectiveness not due to signaling*

*Product Dummy: control for product heterogeneity*

*Accessories: number of additional accessories included*

*Seller setup: number of other items the seller is offering at the same time*

*Reference Price: suggested retail price of the product*

### **Data Collection**

Our data will be collected from [www.ebay.com](http://www.ebay.com). All information outlined above can be directed obtained from their website by parsing individual auction pages. We selected electronic products segment of [www.ebay.com](http://www.ebay.com) as the target product group for testing analysis. Best selling models of handheld, or PDAs, are ranking by [www.CNET.com](http://www.CNET.com). Most of the besting selling models are at the high-end segment of the PDA market. We intend to use the auctions of a variety of high-price and low-price PDAs to generate our B2C data. Auction from the Ebay Industrial and MRO segment will be used to generate our B2B data. We intend to use commercial radio auctions to gather our B2B data. We intend to obtain approximately 1000 observations, which will leave us sufficient degrees of freedom to conduct our empirical analysis.

## Research Value

This research is designed to test the returns to seller and product credibility using data from on-line auctions. It expands on previous research by adding warranty variables that may be complementary or substitute for feedback and by examining B2B auctions as well as B2C auctions. Additional control variables are used to isolate the effect of credibility systems on the effectiveness of the auction. The use of for measures of effectiveness will provide a more comprehensive test of the impact of credibility systems on effectiveness. The empirical analysis also improves on previous research since we use more rigorous empirical methodologies in our statistical analysis. Testing the credibility systems on various product samples that differ in terms of product value can be used to explain the effectiveness of such systems on auctions of different product groups.

This research will be one of the first studies that apply asymmetric information theory to on-line B2B auctions. The results will demonstrate if self-reinforcing mechanisms (feedback and warranty) significantly mediate the issue of asymmetric information. Despite previous studies suggesting signaling as a possible solution to asymmetric information in traditional purchasing market; such schemes may not be effective for on-line auctions.

Another important insight that comes from this research will be a test of the use of credibility systems as a substitute for personal interactions. The results of this test will provide an indicator for the future of on-line auctions. The effectiveness of “credible credibility system” would suggest on-line auction markets possess the means to thrive in the future.

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