Effects of Seller Certificates on Buyer's Order Cancellation in the E-marketplace

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ABSTRACT

E-marketplaces are implementing various policies to reduce the information asymmetry between sellers and buyers. One popular way is to issue different kinds of certificates (or seals) for sellers, e.g., a quality certificate for sellers who have a lower product return rate than others or a quick certificate for sellers who dispatch products faster than others. Despite a plethora of previous studies on the role of certificates in the e-marketplace, we have a limited understanding of certificate effects in the post-order stage, where buyers can reverse their purchase decision. Based on the psychological contract violation theory and other related literature, we first explain why seller certificates can take a role in buyers' order cancellation decision. Then, we empirically examine the effects of seller certificates using the large transaction data from a leading e-marketplace in Korea. Our findings are as follows. Given the time elapsed from the order, buyers are less likely to cancel the order when the seller has a quality certificate (for sellers who have lower product return rate than others) or a quantity certificate (for experienced sellers who sold a larger amount of products than others). When the seller has a quick certificate (for sellers who dispatch products faster than others), on the other hand, buyers are more likely to cancel the order. Further, the effects of seller certificates on order cancellation are largely varying across purchase channels (Smartphone vs. PC) and product types (convenience goods, shopping goods, vs. specialty goods).

Keywords: E-marketplace, Certificates, Cancellation, Psychological contract violation, Survival Analysis

INTRODUCTION

E-marketplaces are implementing various policies to reduce the information asymmetry between sellers and buyers. One popular way is to issue different kinds of certificates (or seals) for sellers, e.g., a quality certificate for sellers who have a lower product return rate than others or a quick certificate for sellers who dispatch products faster than others [2].

Previous studies show that the presence of those certificates works as a positive signal for buyers to choose among sellers and make an order. The certificates can decrease buyers' perceived risk on transactions [7] and help to develop their trust on sellers [5], resulting in increasing their willingness to pay for goods and services [3]. By signaling sellers' quality, the certificates can promote more online transactions and benefit the entire e-marketplace [10].

While a plethora of previous studies focused on the positive role of certificates in the e-marketplace, they are more or less limited to investigating the role of certificates in buyers' selection decision among different sellers. Little is known about how the certificates work in the post-order stage where buyers can reverse their decision and cancel the order. As the presence of certificates can increase buyer's expectation on sellers' quality, having the certificates can enhance the choice probability for sellers. However, the expectation-confirmation theory suggests that the increased expectation, at the same time, might aggravate the risk of disconfirmation of buyers' beliefs [9] and trigger more psychological contract violation to buyers [11]. That is, when buyers receive a poor product and service, they are more likely to be disappointed with it and take negative actions such as cancelling the order or returning the product, if it is from sellers with certificates, as their expectation for those sellers is higher.

Furthermore, previous studies tell little about the differential values of certificates across product categories and purchase channels. The role of certificates, which reduces the information asymmetry between buyers and sellers, can depend on the product category, as the amount of information that a buyer needs vary across product categories [8]. We have a limited understanding of category-level effects of certificates because the results of previous studies are based on either a single product category [10] or the aggregated categories [3, 6, 7, 12]. Further, previous studies provide little guidance on how the certificates work in the mobile commerce channel. They focused the role of certificates in the traditional e-commerce where the PC is the medium for buyers to collect product information. Little is known about how the certificates work in the mobile channel, which became popular but has unique characteristics differentiated from the traditional PC channel [1].

To fill this gap and expand our knowledge on the role of certificates in the e-marketplace, we empirically investigate the effects of seller certificates on buyers' order cancellation behavior using the large transaction data from the database of a leading e-marketplace in Korea. Specifically, we focused on the role of three different types of certificates, a quality certificate (for sellers who have lower product return rate than others), a quantity certificate (for experienced sellers who sold a larger amount of products than others), and a quick certificate (for sellers who dispatch products faster than others). We also examine the differential effects of certificates across product categories and purchase channels (PC vs. Mobile Phone).

DATA AND ANALYSIS RESULTS

We obtained the data from the leading e-marketplace in Korea. The dataset contains the entire transactions of 60,000 buyers for more than two years (March 2009–June 2011), in which there are around 2.5 million order records and 11.5 thousand cancellation records. Our dataset also contains the information about purchase channels (PC and Mobile), which allows us to examine the different effect of certificates on order cancellation between purchase channels. Table 1 shows the descriptive statistics on the number of orders and cancellations with each certificate and the average time to cancellation after payment.

Cancellations vary in terms of elapsed time after orders. Further, all orders do not end up to cancellations, which poses the issue of censoring. Considering the different cancellation time and the censoring issue, we employed a Cox proportional hazard (PH) model. Table 2 shows our Cox PH regression results. Given the time elapsed from the order, buyers are less likely to cancel the order when the seller has a quality certificate or a quantity certificate. When the seller has a quick certificate, on the other hand, buyers are more likely to cancel the order. Further, the effects of seller certificates on order cancellation are largely varying across product types (convenience goods, shopping goods, vs. specialty goods).

We also compared the certificate effects on cancellation between purchase channels (PC vs. Mobile Phone) (Table 3). Since buyers who were using the mobile channel for purchases (mobile channel adopters) might be different from buyers who were not (mobile channel non-adopters), we first need to address the issue of buyer heterogeneity to tease out the true channel effect. In this regard, we stratify the customers into three groups using the Recency, Frequency, and Monetary (RFM) scores and compare the results within the stratum. The previous study shows that RFM values are sufficient statistics to summarize purchase histories of each buyer, which provides theoretical justification for the use of these measures [4]. Details of our analysis results and managerial implications will be discussed during the conference.

Table 1:Descriptive Statistics

		Order	Cancellation	Average Time to Cancel After Payment (hours, std. deviation in parentheses)
Quick	1	1260557	44581	20.646(.235)
	0	1271577	70948	49.478(.308)
OK	1	1769157	63801	29.238(.243)
	0	762977	51728	49.594(.365)
Big	1	644432	77298	33.856(.243)
	0	1887702	38231	47.443(.415)
Adopter	Mobile	92160	3937	39.434(1.074)
	PC	1073549	52719	37.947(.317)
	Total	1165709	56656	38.050(.304)
Non-adopter		1366425	58873	38.643(.301)
Total		2532134	115529	38.339(.213)

Table 2 :Cox PH Regression Result

		Product Classification		
Variables	Full Model	Convenience Goods	Shopping Goods	Specialty Goods
Main Variables				
SQ	.199***	.064	.229***	.332***
SOK	-.506***	-.345**	-.421***	-.401***
SB	-.157***	-.119	-.121**	-.044
TP	.394***	.637**	.301*	.434**
UA	.046**	-.082	.044	.198**
Order-specific Control Variables				
OA	8.20e-07***	2.83e-06**	5.49e-06***	4.37e-07***
OQ	-1.701***	-2.366***	-1.225***	-2.070***
OSF	1.06e-4	3.10e-04***	2.26e-04***	4.16e-05**
FT	2.275***	3.377***	1.632***	3.234***
Individual-specific Control Variables				
Sex	.243***	.014	.229***	.074
BYR	.007***	.021**	.012***	-.005

TOP	.046***	.056***	.057***	-.044***
Time Interaction Variables (to address the issue of the violation of proportionality)				
SOK*Day1	0.097	-0.200	.185**	.319
SOK*Day2	0.154*	1.005**	.005	-.160
SOK*Day3	.105	-.612	.101	-.162
SB*Day1	-.185**	-.199	-.211**	-.482**
SB*Day2	.087	-.046	.153	.279
SB*Day3	.179**	.686*	.180**	-.159
TP*Day1	.011	-.609	.168	.222
TP*Day2	.063	.403	.077	-.786
TP*Day3	-.461***	-.493	-.569**	-.354
OA*Day1	-7.88e-09	-1.20e-06	-5.00e-07	2.37e-07
OA*Day2	-3.49e-07	1.43e-05	-1.24e-06	-1.33e-06**
OA*Day3	-6.27e-07**	1.26e-05	-1.38e-06	-7.01e-07
Sex*Day1	-0.45	.021	.095	.409**
Sex*Day2	.118	-.057	-.003	-.029
Sex*Day3	-.193**	-.054	-.151	.154
TOP*Day1	-.072***	-.053	-.083***	-.123
TOP*Day2	.030	-.026	.043	.177
TOP*Day3	.007	-.015	-.011	-.120

Note:****p*<0.01, ***p*<0.05, **p*<0.1; The dependent variable is the time gap between payment and cancellation, using the hour as a unit.There are seven binary variables in our model: whether the seller has a quick certificate (SQ), whether the seller has a quality certificate (SOK), whether the seller has a quantity certificate (SB), a dummy indicating the mobile phone transaction (TP), whether the user adopted the mobile channel (UA), the user fee type (FT) and sex. Other four continuous control variables and one discrete control variable are Order Amount (OA), Order Quantity (OQ), Order Shipping Fee (OSF), the inverse form of the time between making the order and finishing payment (TOP) , and Birth year with the reference 1980 (BYR). Day1, Day2, and Day3 are binary variables which refer to whether the order survived longer than 24 hours, 48 hours and 72 hours respectively, to control for the possible time-varying effects.

Table 3 :Cox PH Regression Result of Different Channels

RFM	3-7		8-10		11-15	
Channel	Mobile	PC	Mobile	PC	Mobile	PC
SQ	0.0707112	0.1699455***	-0.0450148	0.201431**	0.3405733*	0.2347109***
SOK	-1.076964***	-0.3474981***	-0.81484***	-0.2215044*	-0.3574291	-0.4532154***
SB	0.3217223*	-0.2606239***	0.0021598	-0.1569871	0.1768267	0.2136409*
SOK*Day1	0.3626052	-0.2252062	0.2067386	-0.1628965	0.6601216	0.2781616
SOK*Day2	0.6354778	0.2063325	0.3280864	0.0999884	0.4652464	-0.3953958
SOK*Day3	0.2311149	-0.0584457	0.6794119	0.1678273	-1.332679*	0.5330608**
SB*Day1	-0.8147824***	-0.1531402	-0.1706727	0.0355682	-1.232587**	-0.4924972**
SB*Day2	0.2601718	0.2405205	0.3121466	-0.287222	1.636114*	0.1658501
SB*Day3	0.0905939	0.269605	0.1070583	0.1759625	-0.4621598	-0.0241504

Note:****p*<0.01, ***p*<0.05, **p*<0.1; RFM refers to the aggregate score of recency, frequency and monetary. The score ranges from 3 to 15, representing the most inactive buyers to the most active buyers. Control variables are not shown for expositional brevity.

REFERENCES

[1] BANG, Y., LEE, D.-J., HAN, K., HWANG, M. & AHN, J.-H. (2013) 'Channel capabilities, product characteristics, and the impacts of mobile channel introduction', *Journal of Management Information Systems,* Vol. 30**,** No. 2, pp. 101-126.

[2] BASU, A. & MUYLLE, S. (2003) 'Authentication in e-commerce', *Communications of the ACM,* Vol. 46**,** No. 12, pp. 159-166.

[3] CLEMONS, E. K. (2007) 'An empirical investigation of third-party seller rating systems in e-commerce: the case of buySAFE', *Journal of Management Information Systems,* Vol. 24**,** No. 2, pp. 43-71.

[4] FADER, P. S., HARDIE, B. G. & LEE, K. L. (2005) 'RFM and CLV: Using iso-value curves for customer base analysis', *Journal of Marketing Research,* Vol. 42**,** No. 4, pp. 415-430.

[5] GRABNER-KRAEUTER, S. (2002) 'The role of consumers' trust in online-shopping', *Journal of Business Ethics,* Vol. 39**,** No. 1-2, pp. 43-50.

[6] HEAD, M. M. & HASSANEIN, K. (2002) 'Trust in e-commerce: evaluating the impact of third-party seals', *Quarterly Journal of Electronic Commerce,* Vol. 3**,** No. 3, pp. 307-326.

[7] KIM, D. J., FERRIN, D. L. & RAO, H. R. (2008) 'A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents', *Decision Support Systems,* Vol. 44**,** No. 2, pp. 544-564.

[8] MUKHERJEE, A. & HOYER, W. D. (2001) 'The effect of novel attributes on product evaluation', *Journal of Consumer Research,* Vol. 28**,** No. 3, pp. 462-472.

[9] OLIVER, R. L. (1980) 'A cognitive model of the antecedents and consequences of satisfaction decisions', *Journal of Marketing Research,* Vol. 17**,** No. 4, pp. 460-469.

[10] ÖZPOLAT, K., GAO, G., JANK, W. & VISWANATHAN, S. (2013) 'The Value of Third-Party Assurance Seals in Online Retailing: An Empirical Investigation', *Information Systems Research,* Vol. 24**,** No. 4, pp. 1100-1111.

[11] PAVLOU, P. A. & GEFEN, D. (2005) 'Psychological contract violation in online marketplaces: Antecedents, consequences, and moderating role', *Information Systems Research,* Vol. 16**,** No. 4, pp. 372-399.

[12] RICE, S. C. (2012) 'Reputation and uncertainty in online markets: an experimental study', *Information Systems Research,* Vol. 23**,** No. 2, pp. 436-452.