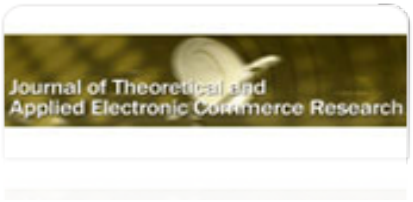

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Roles of the Buyer's Trust in Seller in Posted-Price Model of Consumer to Consumer E-Commerce

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Abstract

The buyer's trust in seller in consumer to consumer e-commerce plays a critical role in consumer purchase decisions. Thus, this paper aims at analyzing the relationships between buyer's trust in seller, price discount, and price premium by using product price as a moderator variable. A trust function for sellers was calculated through a questionnaire, by using the feedback mechanism and by applying Analytical Hierarchy Process. Our empirical study, using historical transaction data, indicates that buyer's trust in seller in the case of an expensive product is more important than that in an inexpensive product. Buyers'behavior when purchasing a higher-priced product was more sensitive to the buyer's trust in seller than to product price. Product price played the role of a moderator variable in the relationship between buyer's trust in seller and price discount. However, there was no evidence that product price performs the function of a moderator variable in the relationship between buyer's trust in seller and price premium.

Keywords: C2C e-commerce, Trust, Price premium, Feedback mechanism, Price discount, Analytical hierarchy process

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1 Introduction

This study regarding trust in e-commerce distinguishes C2C (Consumer to Consumer) e-commerce from B2C (Business to Consumer) e-commerce with merchandisers. In other words, Internet shopping malls refer to B2C e-commerce, whereas online open marketplaces are classified as C2C e-commerce. In general, merchandisers of B2C e-commerce are responsible for their management, ranging from product sourcing to marketing and after-service. B2C intermediaries charge of responsibilities for quality assurance, payments, transportation, and returns/refunds, among others, whereas individual sellers of C2C e-commerce are directly responsible for those. C2C intermediaries only offer secure trading environments for sellers and buyers who take charge of transactions. Thus, the buyer's trust in the seller in C2C e-commerce plays a critical role in consumer purchase decisions. C2C e-commerce is classified into posted-price model and auction model in accordance with their price-making mechanisms. The posted-price model uses a fixed-price mechanism that is typical of catalog purchasing, whereas a dynamic pricing mechanism (or auction price mechanism) is generally employed in the auction model. In the case of Korea, the posted-price model accounts for a large share of C2C e-commerce.

Trust in e-commerce has a crucial role in the diffusion of e-commerce [11], [17], [20], [27]. [11] investigated calculative-based beliefs, institution-based structural assurances, institution-based situational normality, and knowledge-based familiarity as antecedents of trust and stressed a role of trust in B2C e-commerce. [27] analyzed the relationship between trust and e-commerce consumer actions and suggested trust constructs such as disposition to trust, institution-based trust, trust beliefs, and trusting intentions. The role of trust in C2C e-commerce is more important than that in B2C e-commerce because vulnerability to sellers' opportunistic actions is relatively high [30], [39]. The factors related to trust and price are crucial to online consumers' purchase decisions [12], [46], [47]. Although there have been many trust studies in C2C e-commerce [3], [26], [38], [40], [43], few have considered both trust and product prices together from the perspective of consumers' purchasing decisions [2]. In general, customers wishing to buy a product must first determine whether they would visit offline malls or online stores. If they decide to visit online stores, they can buy the product from B2C sites or C2C sites. In such situations, they would consider both trust and price factors when making their purchase.

Our research deals with the posted-price model in C2C e-commerce. [25] empirically analyzed various factors influencing customer satisfaction and preferences in C2C e-commerce by comparing B2C with C2C and suggested that cost savings (which he defined as the difference in prices between C2C and B2C transactions) represent an important determinant of customer satisfaction and preferences. Thus, price discounts in C2C e-commerce can influence consumer purchasing decision. Hereafter, a price discount is defined as the difference in prices between C2C e-commerce and B2C e-commerce. In C2C e-commerce, a buyer selects one of many sellers offering different prices. The buyer's trust in the seller in C2C e-commerce is an important determinant of customers' purchase decisions [6]. This means that a higher level of trust in a seller provides an opportunity for the seller to propose a higher price to the buyer. According to [6], [15], [32], [38], a seller's reputation as a form of trust has a substantial effect on the final price premium. In general, a price premium is defined as an amount of money paid in addition to the fair price, where the fair price is considered to be justified by the true value of the product [31]. Hereafter, the price premium refers to the monetary amount paid in addition to the average price for the identical product or service. Price premiums result from customers' willingness to pay an extra amount to reputable sellers to reduce transaction risk. [2], [29] examined the relationship between trust in the seller and price premiums by using data from sellers based on the auction model of eBay.

Noteworthy is that eBay has been making a gradual shift from the auction model to the posted-price model [20], [28]. C2C is a growing area of e-commerce and encompasses much more than just auctions [21]. In terms of C2C e-commerce in Korea, including sites such as Auction, Gmarket, Interpark, and 11st, transactions based on the posted-price model have exceeded those based on the auction model in terms of both sales volume and the number of sellers. However, no study has examined the relationship between trust and price factors in the context of C2C e-commerce based on the posted-price model. This paper, unless otherwise specified, considers C2C e-commerce to be based only on the posted-price model. That is, this study is only investigating the posted-price model in C2C e-commerce.

In this regard, there is a need for an examination of the buyer's trust in the seller, price discounts, and price premiums in C2C e-commerce from the perspective of customers' purchase behavior in the context of the posted-price model. Thus, the principal objective of this study is to answer the following two research questions:

Does the buyer's trust in the seller have an effect on price discount in C2C e-commerce and will the influence of the buyer's trust in the seller vary depending on product prices?

Does the buyer's trust in the seller have an effect on price premium in C2C e-commerce and will the influence of the buyer's trust in the seller vary depending on product prices?

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Section 2 introduces research method, research design and hypothesis. Section 3 proposes a new approach to measure the buyer's trust in the seller in C2C e-commerce. Section 4 describes sampling design including data collection and hypothesis test. Section 5 discusses the relationships between trust, price discount, and price premium. Finally, the paper concludes and suggests implications.

2 Research Design and Hypothesis

This section introduces research method, research model, and research hypotheses.

2.1 Research Method

This study proposes a new two-step method for answering two research questions. It is very important to measure the buyer's trust in the seller before examining the relationships between buyer's trust in the seller and product price factors. The first step involves the use of a questionnaire and the analytical hierarchy process (AHP) for creating a trust function for sellers. AHP is a multi-criteria decision making tool using hierarchical way with goals, sub-goals, or alternatives [33]. AHP is utilized when determining the attribute weights by pair-wise comparisons of the attributes as criteria for decision making [36]. It is widely used ranging from military analysis to planning of transportation systems [33], [36]. Data collected from survey using questionnaire of Appendix A is used in AHP. AHP analysis results in a trust function for calculating the buyer's trust in seller.The second step involves analysis on the relationships between buyer's trust in the seller, price discount, and price premium, and finally a moderated regression analysis using historical transaction data from the sample site for testing the hypotheses. Figure 1 presents research methods for each step.

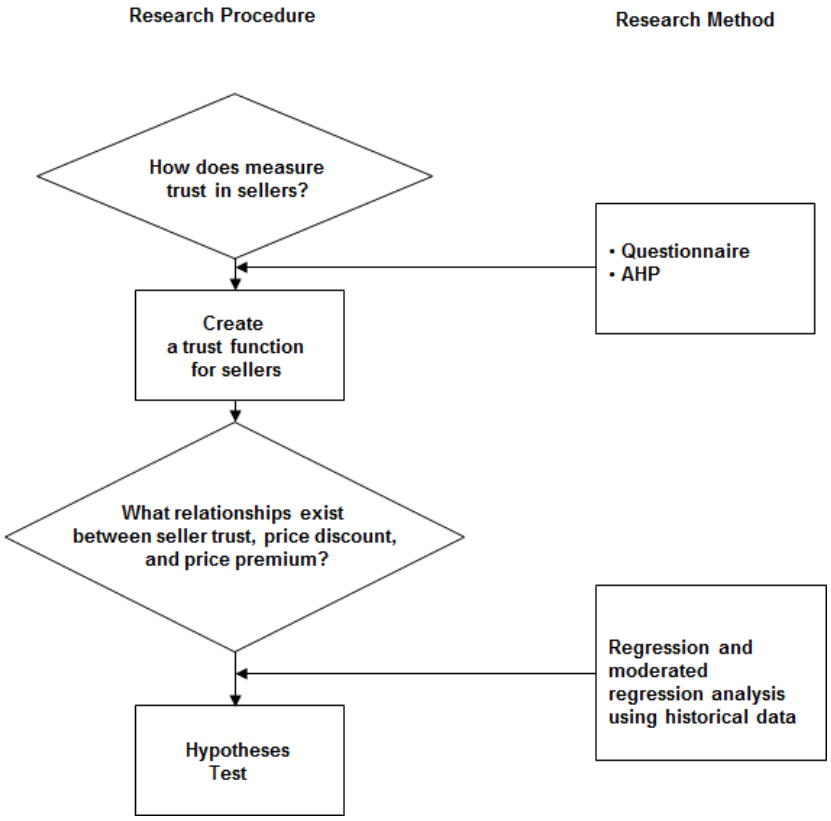

Figure 1: Research procedure and method

2.2 Research Model

Trust in C2C e-commerce can be classified into the following categories: Buyer's trust in the seller and institution-based trust (also referred to as web site trust) [30]. Following [2], buyer's trust in the seller is defined as the subjective assessment that a seller will perform a particular transaction according to his or her confident expectations. The buyer's trust in the seller results from credibility and benevolence [2], [14]. Credibility-based trust is usually impersonal and relies on reputation information and economic reasoning, whereas benevolence-based trust is rooted in repeated buyer-seller relationships [2]. This study focuses on the credibility-based trust. Institution-based trust includes escrow services, real-name systems, and the *three-strikes and you're out* policy (i.e., sellers who violate safety and transaction guidelines more than three times would be banned from the online marketplace). Trust can be

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transferred from one source to another. For example, a consumer's trust in an unknown target may be influenced by his or her trust in an associated target [40]. In other words, institution-based trust can be transferred to buyer's trust in the seller [14], [41].

Seller's reputation in C2C e-commerce is positively associated with sales price [2], [29], [32], [48]. Reputation can be considered as a form of credibility-based trust [2]. Seller's reputation is defined as the fame or popularity evaluated in the form of feedback ratings by buyers. Many previous studies have examined reputation systems or feedback mechanisms in C2C e-commerce [2], [9], [13], [32], [48]. Online feedback mechanism plays an important role in the successful diffusion of C2C e-commerce [13]. According to [2], appropriate feedback mechanisms in C2C e-commerce induce trust in buyer-seller relationships. The feedback mechanism on eBay reflects buyer's trust in seller's credibility [2]. [2] posited that the number of positive rating and negative rating as the feedback profile on eBay represent buyer's trust in seller. Thus, the feedback profile in C2C e-commerce represents buyer's trust in seller shown in Figure 2. eBay's reputation scores play an important role in C2C transactions and that all significant sellers under experimental environment have higher reputations [32]. Thus, the feedback profiles in C2C e-commerce can be used as a proxy of buyer's trust in seller.

In C2C e-commerce, compared with sellers who lack consumer trust, trustworthy sellers are rewarded with higher prices, lower price discounts, and greater price premium. Most C2C e-commerce sites have a reputation system using a feedback mechanism in which a form of trust is built by buyers' feedback ratings [9], [48]. Price is one of the most common reasons why consumers purchase from online stores [4]. Consumers use reference prices, which act as an internal standard against which observed prices are compared, to evaluate the purchase of a product [8]. Rreference prices utilize past prices as parts of the consumer's information set [23]. Price discounts not only offer economic benefits to consumers, but also increase their purchase intentions [44]. On the other hand, price discounts in C2C e-commerce compared with those in B2C e-commerce play a critical role in reducing reference prices. Thus, from the consumer purchase viewpoint, reference prices for a product in C2C e-commerce are different from those in B2C e-commerce. Buyers in C2C e-commerce expect more discount than those in B2C e-commerce. Thus, price discount is directly related to the buyer's trust in the seller in C2C e-commerce. According to previous studies [2], [3], buyer's trust in the seller provides the seller with price premium opportunities. A study on eBay's feedback mechanisms, which were used as a proxy for buyer's trust in the seller, demonstrated the existence of a linear relationship between buyer's trust in the seller and price premium.

The risk perceived by customers can vary depending on the price of the given item, and their purchase intentions depend on perceived risk. According to [2], a transaction involving an expensive product is riskier than that involving an inexpensive product. Relationships between buyer's trust in the seller, price discounts, and price premiums also differ depending on product price. Thus, we present a research model in which product price is utilized as a moderator variable (Figure 2). Our research is distinguished from [2] in terms of the method of transforming the feedback profiles to buyer's trust in sellers. [2] used the logarithm of the number of positive rating and number of negative rating for each seller as a surrogate of buyer's trust in seller. On the other hand, this study suggests one dimensional unified measure applying a trust function drawn from a questionnaire and AHP.

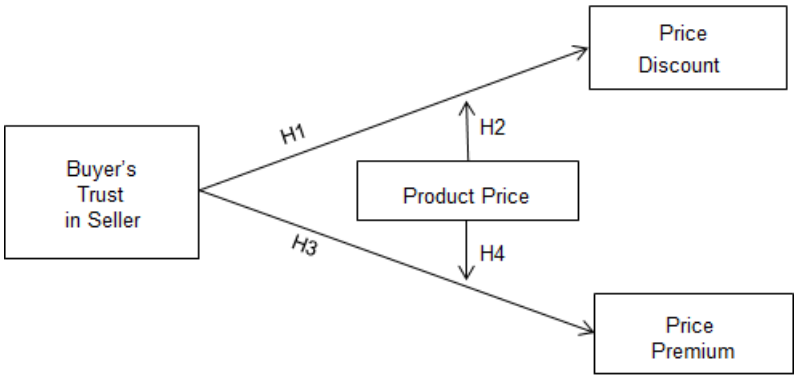

Figure 2: Research model

2.3 Hypotheses

A number of studies have examined the effects of price discounts on the purchase behavior of customers [10], [43], [45], and thus, there is a need for a better understanding of the reason why online consumers are more likely to purchase products from C2C e-commerce than from B2C e-commerce. In this regard, this study uses the average prices in B2C e-commerce as the reference prices for calculating price discounts. Although price discounts represent a good tool for attracting customers, a price discount can induce negative feelings and emotions in customers, and, thus, such strategies may be inappropriate for attracting customers in the long run [10]. Buyer's trust in the seller in online open marketplaces may reduce price discounts.

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H1: Buyer's trust in seller is negatively associated with price discount in online open marketplaces.

Buyer's trust in seller may be more likely to reduce price discounts when it is high than when it is low. The perceived risk related to a purchase is a key determinant in consumer purchase decisions [18], [24]. Prior research has hypothesized that product price is related to the perceived risk [18], [37], [44]. Buyer's trust in the seller reduces the perceived risk in online transactions. The relationship between buyer's trust in the seller and price discount depends on product price. Thus, the following hypothesis is proposed:

H2: Product price plays a role of a moderator variable in the relationship between buyer's trust in seller and price discount.

Buyers are willing to pay an additional price when purchasing from trustworthy sellers [2], [28], [39]. According to [2], feedback profiles in C2C e-commerce induce buyer's trust in seller and lead to price premiums. They applied two methods to examine the relationship between buyer's trust in seller and price premium. The first method was an online field experiment that manipulated feedback profiles and product prices under a controlled environment. The second method used historical data from transactions based on the auction model of eBay to examine whether a good feedback profile would lead to price premiums. They used feedback profiles as a proxy for buyer's trust in seller. Thus, the trust level of each seller was measured by the number of positive and negative ratings. The two methods provided slightly different findings. According to the experimental method, a higher level of trust led to higher price premiums, whereas according to the field method, negative ratings did not influence price premiums, although positive ratings led to higher price premiums. [28] studied how information assurance seals such as power seller and square trade impacted consumer purchasing behavior in the context of both the auction and catalog models of C2C e-commerce. In the case of the auction model, there existed a significant relationship between the presence of a seal and price premium existed. On the other hand, there are no any studies for such a relationship in the posted-price model.

H3: Buyer's trust in seller has a positive effect on price premiums in C2C e-commerce.

When buyers purchase expensive products, they feel higher risk because the likelihood of their loss due to seller's opportunistic behavior is high. Thus, buyers will pay a higher price premium for expensive products than for inexpensive products. According to [2], the relationship between trust in the seller and premium is stronger for expensive products than for inexpensive products in the case of the auction model on eBay. Thus, the following hypothesis is proposed.

H4: Product price plays a role as a moderator variable in the relationship between buyer's trust in seller and price premiums.

3 Measuring the Buyer's Trust in Seller

One of the most important steps in any analysis of the relationships between buyer's trust in seller, price discounts, and price premiums is to identify and calculate the level of buyer's trust in seller. This study proposes a novel method for calculating buyer's trust in seller by using actual data from reputation systems in C2C e-commerce.

[34] proposed the difference between image and reputation as a socially transmitted meta-belief and developed the Repage as a computational system for partner selection among agents. A number of studies have considered feedback mechanisms as an important method for building trust in online open marketplaces [9], [13], [32], [48]. The beta reputation system is a sophisticated engine calculating the value of the users' reputation ratings from various inputs including feedback from other users [22] p. 2. [7] proposed a fuzzy computational model for trust and reputation systems. Trust indices in Auction such as seller grade, purchase satisfaction, and merchandise assessment are very similar to the reputation ratings which can be calculated by a reputation engine. Reputation and feedback profiles for sellers in C2C e-commerce use data from various sources, including, grades and text comments, among others. It is important to measure the buyer's trust in seller as the first procedure of Figure 1 by using such reputation and feedback profiles. A simple method is to directly use feedback profiles instead of buyer's trust in seller to analyze the relationship between buyer's trust in seller and rewards or prices [2], [29], [48]. Two previous studies [2], [29] dealt with the relationship between buyer's trust in seller and price premium. For example, [2] made direct use of positive or negative ratings as proxies for buyer's trust in the seller. However, a drawback of this method involves its inability to distinguish between various levels of buyer's trust in seller because sellers tend to receive positive ratings for most transactions. Another method for measuring buyer's trust in seller involves a questionnaire asking buyers to rate sellers on past transactions. For an example, [29] identified trust in seller by identifying those buyers who entered into a specific transaction with a specific seller and inviting them to participate in the survey. However, such a method takes time for researchers and buyers have to remember a specific transaction with a specific seller and assess the seller according to questionnaire items.

Our method generates a function for calculating the level of buyer's trust in seller through the use of actual data from each reputation or feedback profile. We used Auction (Site 1), the largest and oldest C2C e-commerce site in Korea, to test the hypotheses. All the sellers on Auction had feedback profiles, which included seller grades, purchase

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satisfaction, and seller assessment/merchandise assessment. For the remainder of this paper, information on seller ratings is referred to as trust indices. The questionnaire item 1 in the Appendix A was used to make the pairwise comparison of three criteria. Auction classified seller grades into seven symbols ranging from novice to VIP based on sellers' trading history (please refer to questionnaire item 2 in the Appendix A). Purchase satisfaction for each of the eight grades was determined using buyer feedback (please refer to questionnaire item 3 in the Appendix A). Seller assessment and merchandise assessment were classified into five grades ranging from highly unsatisfactory to highly satisfactory by aggregating buyer ratings (please refer to questionnaire item 4 in the Appendix A). When buyers make a purchase decision on Auction, they refer to three trust indices. To reflect buyers' perception in trust indices, we conducted a survey asking buyers to evaluate the relative importance of trust indices and to rearrange different scales of trust indices into three grades: untrustworthy, trustworthy, and absolutely trustworthy. The questionnaire was pretested with 52 buyers who purchased a product on Auction. The primary objective of the pretest was to check the content validity and proper wording of the questionnaire. A total of 252 valid samples were collected from a questionnaire through which the respondents were instructed to assess the importance of the three trust indices, and to classify the trust levels for each index into three grades (please refer to the Appendix A). Web-based survey was conducted by an online research institute, (Site 2). Table 1 shows the demographic characteristics of the respondents. 53% of respondents are male, while 47% are female. 47% of respondents came from the 20 to 30 year of age group. Their gender and age were similar to those of Internet users in South Korea. According to 2012 National Informatization White Paper of South Korea, the percentage of male and female Internet users is respectively 53% and 47%. The percentage of Internet users by age is as follows: 24.1% for less than 19 years, 17.9% for between 20 and 29, 20.9% for between 30 and 39, 20.1% for between 40 and 49, and 17.0% for over 50 years. 70% of respondents had one to four purchase experiences during the last six months on Auction site.

Table 1: Demographic characteristics of respondents

Items	**Classification**	**Frequency (%)**
Gender	male	134(53)
	female	118(47)
Age (years)	less than 19	45(18)
	20-29	68(27)
	30-39	49(20)
	40-49	51(20)
	over 50	39(15)
Number of purchase experience during the last six months in Auction site	1-2	107(42)
	3-4	70(28)
	5-6	25(10)
	7-8	15(6)
	9-10	15(6)
	over 11	20(8)

We calculated weights of three trust indices via the application of AHP to the sample data. Question 1 in the Appendix A refers to the measure of importance of trust indices. A series of responses may not be consistent. The degree of inconsistency can be measured by the consistency ratio (CR) to reduce it as much as possible [33]. Responses with CR ≤ 0.1 are generally sufficiently consistent [33], [36]. A total of 79 samples, excluding 173 samples in which the CR exceeded 0.1, were utilized to calculate the weights of indices representing their relative importance. Respondents reported that purchase satisfaction was the most important index, as is shown in Table 2.

Table 2: Weights by types of feedback ratings for buyer's trust in seller on auction

Type of trust index	**Weight**	**CR**
Seller grade (w_1)	0.299	0.0000041344
Purchase satisfaction (w_2)	0.387	
Seller assessment/merchandise assessment	0.314	

The trust function in seller consists of the weight and the three indices.

$$T_i = \sum_{j=1}^{3} w_j * x_{ij} \quad (1)$$

Where, i = 1, … , n, n: number of sellers, j refers to a type of trust indices. T_i refers to the level of trust in the ith seller; X_{ij} indicates the value of the jth index for the ith seller; and w_j is provided in Table 2. We used data from Questions 2, 3, and 4 of the questionnaire to calculate. X_{ij} The rating of 6.0 for the seller grade (Table 3) was the median for the data from Question 2.1. If the grade of a specific seller (i) was *VIP* or *diamond*, we allocated 3 to. X_{i1} Further, X_{i1} was 2 for *sapphir*e, 1 for *gold* or *silver*, and 1/2 for *bronze* and *novice*. This method provided standardized values for trust levels, ranging from 1/2 to 3 for each seller. For example, the trust level for a seller was 3 (0.299*3 + 0.387*3 + 0.314*3) when his indices indicated *VIP* for the seller grade, five stars for purchase satisfaction, and a highly satisfactory seller assessment.

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Table 3: Median of trust level by indices

Type of trust index	(absolute trust) median	(somewhat trust) median	(never trust) median
Seller grade	6.0	5.0	2.0
Purchase satisfaction	8.0	6.0	3.0
Seller assessment/merchandise assessment	5.0	4.0	2.0

4 Sampling Design and Hypothesis Test

Sampling design is an important process for controlling variables affecting price of a transaction item. Sellers in C2C e-commerce based on the posted price model provide different prices for the same product or service. Some sellers offer free coupons or accessories with a given product. Such offerings and the time-frame of data collection influence buyers' purchase intention. Thus, we controlled for other variables influencing prices (except for buyer's trust in seller) for the analysis of the relationships between buyer's trust in seller, price discounts, and price premiums. Further, we selected any items and transactions that satisfied the following three conditions as the samples:

- No difference in product quality exists in the standardized product
- No other transaction conditions influencing prices, such as accessories or free gifts, exist
- No price variances across transaction periods, including seasonal effects, exist

Before selecting items on Auction, interviews with four sellers and five buyers were conducted to determine their definition of low-priced items. Most of the interviewees suggested products below 70 US dollars as low-priced items. A total of four items (two inexpensive products as the lower-priced items and two expensive ones for the higher-priced items) were selected. The two lower-priced items were a speaker ($26) and a chair ($62). The two higher-priced items were a multifunctional office device ($450) with printing, copying, faxing and scanning functions and an LCD-TV ($950). To test the hypotheses, we collected transaction data and feedback profiles from 167 sellers offering these four products (speaker, n=47; chair, n=45; multifunction device, n=34; LCD-TV, n=41) on Auction. Price discounts were calculated by subtracting the actual transaction price on Auction from the average market price on B2C e-commerce. To calculate the average market price for each sample item, we searched five leading internet shopping malls in Korea. The market price was the average of the actual retail prices for these malls during the analysis period. As shown in Appendix B, the average of retail prices (average market price) for five Internet shopping malls was 951,670 won ($950). The price discount of the first sample of seller in Auction is 151,670 won calculated by subtracting the seller's retail price (800,000 won) from the average market price (951,670 won).

On the other hand, price premiums were calculated by subtracting the average price of the samples for each product from the price of each sample item [29]. In this paper, price discounts are not just the opposite of price premiums: price discounts reflect the average price of products offered by Internet shopping malls (B2C sites), whereas price premiums refer to the average price of products on Auction. As shown in Appendix B, the average price of the samples for LCD-TV was 815,290.24 won. The price premium of the first sample of seller in Auction is -15,290.24 won calculated by subtracting the average price of the samples (815,290.24 won) from the seller's retail price (800,000 won) as shown in Appendix B.

Table 4: Results of regression analysis by types of product

Items	R^2	F-value	Std. Beta	t
Speaker (N=47)	.012	.533	.108	.730
Chair (N=45)	.018	.790	–.134	–.889
Multifunction device (N=34)	.157	5.955*	–.396	–2.440*
LCD-TV(N=41)	.109	4.774*	–.330	–2.185*

* $p < 0.05$
Independent variable: buyer's trust in seller, dependent variable - price discount

To test H1, we conducted a regression analysis. Table 4 shows the results of regression analysis between buyer's trust in seller as an independent variable and price discount as a dependent variable for four product items. Standard betas (or coefficients) and t-values are low for speaker and chair as the lower-priced items, whereas those of multifunction device and LCD-TV as the higher-priced items are high. Thus, H1 was partially supported at the 0.05 level of significance. Buyer's trust in the seller was significantly related to price discounts for higher-priced products, but there was no such relationship for lower-priced products. For higher-priced products selling for more than $450, buyer's trust in the seller had a significant effect on price discounts, but there was no such effect for lower-priced products selling for less than $70.

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H2 is supported. According to the moderated multiple regression analysis [5], the product price played a moderating role in the relationship between buyer's trust in seller and price discounts. The price was a quasi-moderator variable that not only interacted with the independent variable but also played a role as an independent variable. Model 1, a restricted model, included buyer's trust in seller as an independent variable (Table 5). The restricted regression model was significant at the 0.01 level. According to the model, buyer's trust in the seller explained 7.4% of price discounts (R^2 = .074). Model 3 (Table 5) considered the interaction effect and was significant at the 0.01 level. Its R^2 was 0.719. Buyer's trust in seller (b=-2.106, p < 0.05), the product price (b=19.094, p<0.01), and trust*price (b=-2.039, p<0.05) had significant effects on price discounts. The interaction term *trust*price* was computed through mean centering [1] to avoid the multicollinearity issue. The means of buyer's trust in the seller and product price variables were computed. Each value of their variables was then replaced with the difference between each value of the variable and the mean. Tolerance is a widely used measure of multicollinearity, and a tolerance value of less than 0.1 indicates multicollinearity. As shown in Table 5, the tolerance values for all our models were close to 1.0, indicating no multicollinearity.

Table 5: Results of moderated hierarchical regression analysis

Independent variable	**Main effect**						**Interaction effect**		
	Model 1			**Model 2**			**Model 3**		
	Std. Beta	t	Tolerance	Std. Beta	t	Tolerance	Std. Beta	t	Tolerance
buyer's trust in the seller	–.273	–3.644**	1.000	–.125	–2.931*	.967	–.094	–2.106*	.858
price				.812	19.053**	.967	.807	19.094**	.964
trust*price							–.090	–2.039*	.876
R^2	.074			.712			.719		
F value of Model	13.279**			202.723**			139.135**		
F value ***	-			363.306**			4.060*		

* p < 0.05 , ** p < 0.001
*** $F = \{(R_F - R_R)/(k_F - k_R)\}/\{(1- R_F)/(N- k_F-1)\}$, R_F: R^2 of full model, R_R: R^2 of restricted model, k_F: number of independent variable in full model, k_R: number of independent variable in restricted model, and N: number of samples.
N: 167, dependent variable: price discount

Table 6 shows the average price discount for four sample products. The higher the product price, the greater the price discounts buyers demand. In general, the motivation of buyers to purchase in open marketplaces for relatively higher-priced products is attributable to bigger price discount than is offered in other marketplaces, such as B2C e-commerce. In the case of inexpensive products (e.g. the speaker), price discounts were, on average, negative (Table 6), indicating that the actual retail prices of those products were higher for Auction than for B2C e-commerce. Why do consumers use C2C e-commerce to purchase very inexpensive products, even though their prices tend to be higher than those offered by B2C e-commerce? The reason may be neither price discounts nor trust. That is, purchase decision-making depends neither on buyer's trust in seller nor on price in the case of lower-priced products. Such factors as variety of items, convenience, and timeliness are essential if buyers can be assured that C2C e-commerce with institution-based trust is reliable. Institution-based trust includes escrow services, real-name systems, and the *three-strikes and you're out* policy (i.e. sellers who violate safety and transaction guidelines more than three times would be banned from C2C e-commerce).

Table 6: Average price discount by average market price of products

Product (Average market price)	**Speaker ($26)**	**Chair ($62)**	**Multifunction device ($450)**	**LCD-TV ($950)**
Average price discount ($)	–1.62	2.15	7.51	136.38

To test H3, we conducted a regression analysis (Table 7). H3 was partially supported at the 0.05 level of significance. For higher-priced products selling for more than $450, buyer's trust in seller had a significant effect on price premiums, but it had no such effect for lower-priced products selling for less than $70.

Table 7: Results of regression analysis by types of product

Items	**R^2**	**F-value**	**Std. Beta**	**T**
Speaker (N=47)	.012	.533	–.108	–.730
Chair (N=45)	.018	.790	.134	.889
Multifunction device (N=34)	.157	5.955*	.396	2.440*
LCD-TV(N=41)	.109	4.774*	.330	2.185*

* $p < 0.05$
Independent variable: buyer's trust in the seller, dependent variable: price premium

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As shown in Table 8, H4 was rejected. According to the moderated multiple regression analysis, the product price did not play a moderating role in the relationship between buyer's trust in the seller and price premiums. In other words, the product price did not play a significant role as a moderator variable.

Table 8: Results of moderated hierarchical regression analysis

Independent variables	**Main effect**						**Interaction effect**		
	Model 1			**Model 2**			**Model 3**		
	Std. Beta	t	Tolerance	Std. Beta	t	Tolerance	Std. Beta	t	Tolerance
buyer's trust in the seller	0.231	3.050**	1.000	.239	3.096*	. 967	.199	2.440*	. 858
Price				.044	.564	. 967	.050	.645	. 964
trust*price							.117	1.452	. 876
R^2	.053			.055			.067		
F value of model	9.303**			4.791**			3.919**		
F value ***	-			.347			2.096		

* $p < 0.05$, ** $p < 0.01$
N: 167, dependent variable: price premium

5 Discussion

This section discusses relationships between trust, price discount, and price premium in the process of consumer's purchase decison making.

5.1 Trust, Price Discount, and Purchase Decision Making

The first research question presented in the introductory section involved the identification of the relationship between buyer's trust in seller and price discount in the purchase decision-making process. This study addressed to investigate only posted-price models in C2C e-commerce. The result of the testing of hypothesis 1 (H1) demonstrates that buyer's trust in seller has a negative effect on price discount significantly in the case of expensive products, whereas their relationship in the case of inexpensive products is not significant. In the case of inexpensive standardized products priced below $30 like the channel speaker, the relationship between buyer's trust in seller and price is negative, although not significant.

Trust plays a critical role in facilitating economic exchange. Increased institutional-based trust can reduce perceived risk [35], and if a critical level of institution-based trust is established, buyers are less sensitive to prices of inexpensive products. [30] argued that trust in the intermediary, the perceived effectiveness of feedback mechanisms, and the perceived effectiveness of escrow services can build buyer's trust in seller. In the case of inexpensive products, buyers make decisions to purchase regardless of buyer's trust in the seller and product price in C2C e-commerce with institution-based trust. This argument is supported by the findings of our research, most notably the test of hypothesis H1. The Auction selected as a sample of enterprise to test our hypothesis has institution-based trust mechanisms, including real-name systems, escrow service, and fraud protection & prevention. Our survey result, as is shown in Table 9, supported an important role of institution-based trust in Auction. Buyers tend to believe that transactions in Auction are reliable, as is shown in Table 9. This indicates that institution-based trust built from laws related to e-commerce, escrow services, feedback systems, and assurance seals issued by third-party can play an important role in inducing customer participation in C2C e-commerce. Escrow services are mandatory in Korea's C2C e-commerce, whereas they are optional on eBay. All sellers in C2C e-commerce in Korea must observe regulations and obey escrow services. The channel speaker, whose average retail price on Auction was $26, was priced higher than that sold by B2C e-commerce (Table 6), indicating that for inexpensive products in C2C e-commerce, factors other than prices may influence customers' purchase decision.

In general, a buyer's perceived transaction risk for an expensive product is higher than that for an inexpensive product, as buyers tend to perceive that sellers can obtain more benefits from cheating in the trade of an expensive product. Thus, buyers are more sensitive to buyer's trust in seller than product price when they purchase expensive items. The result of our test of hypothesis H1 is consistent with the common sense of the issue. From the result of our test of hypothesis H1, we can infer that buyers who purchase higher-priced products select more reliable sellers although the amount of price discount is small.

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Table 9: Buyer's evaluation for trading and feedback mechanism on Auction

Items (N=252)	Average (standard deviation)*
Trust for transactions in Auction	5.18 (1.001)
Reliability for the feedback mechanism of Auction	5.05 (0.905)

* All items are measured on Likert-type scales. 1: completely unreliable, 4: neutral, 7: completely reliable

According to the results for H2, product price played a role as a moderator variable in the relationship between buyer's trust in seller and price discounts. The left oval in Figure 3 indicates a group of lower-priced products, whereas the right oval, a group of higher-priced products. We used standardized coefficients (beta) to determine the degree to which buyer's trust in the seller influenced price discounts. The effect of reduced price discounts through buyer's trust in seller was greater for expensive products than for inexpensive products.

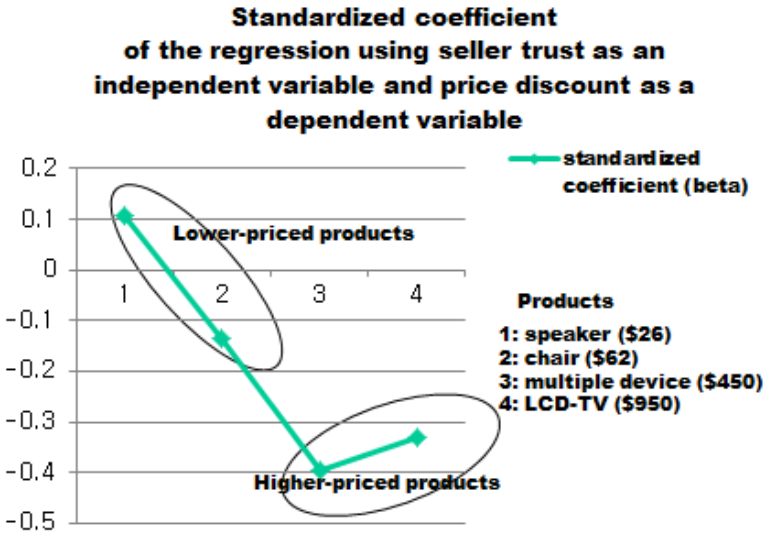

Figure 3. Moderating effect

5.2 Trust and Price Premium

The second research question addresses the relationship between buyer's trust in seller and price premiums. H3 was partially supported. Buyer's trust in seller had a positive effect on price premiums only for higher-priced products. There was no evidence that product price performed a role as a moderator variable in the relationship between buyer's trust in the seller and price premiums, although [2] showed that, by examining data from eBay based on auction model, the product price can moderate the relationship between credibility and price premiums.

Previous studies [2], [29] have suggested that, buyer's trust in seller can influence price premiums, regardless of the product price. However, trust is more likely to influence price premiums for expensive products than for inexpensive products. For inexpensive products, the results of our study differ from those of previous studies. The reason for these differences is that the type of institution-based trust found on Auction differs from that on eBay. Auction's regulations and rules are stricter than eBay's. For instance, an individual whose membership was cancelled as a result of a serious violation of Auction's rules and policies can never again become a member (Auction ensures this through the use of the real-name system). eBay users, however, can readily change their identity, and thus, eBay would have considerable difficulty enforcing such a measure.

Table 10: Comparison of institution-based trust mechanisms

Criterion	Auction	eBay
Real-name system	Members use their real-names, which must be on registered credit cards/bank accounts	There is no real-name system
Escrow service	All transaction must employ Auction's escrow services	Using escrow services is optional
Penalty for a violation	Auction can cancel the membership permanently	eBay suspends the account

According to [16], sellers rarely have negative feedback because those with many negative comments often change their identity and open a new account. The use of escrow services is mandatory on Auction, whereas it is optional on eBay (it is available upon an agreement between the seller and the buyer). This indicates that differences in trust in the site can have considerable influence on the relationship between buyer's trust in the seller and price premiums. Higher trust in the site based on institutional-trust mechanisms can render customers less sensitive to the buyer's

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trust in the seller, particularly for inexpensive products. According to trust transference theory [19], [40], trust in the site can be transferred to buyer's trust in the seller on sites such as eBay [14], [42]. These findings provide support for our argument in that positive attitudes toward the marketplace can lead to similar attitudes toward the sellers in that marketplace.

Table 11 summarizes the results of our research from the consumer purchasing behavior perspective. Online customers choose B2C e-commerce or C2C e-commerce in the market-choice stage and then purchase products from sellers by comprehensively considering trust, price discounts, and price premiums.

Table 11: Customer behavior by purchase decision stage

Stage	**Decision problem**	**Determinants**	**Product price**	
			Inexpensive	**Expensive**
Choice of the online market	B2C e-commerce or C2C e-commerce	Buyer's trust in seller and price discounts	No significant evidence for the relationships	As compared to B2C e-commerce, price discount is a determinant of the purchasing decision.
Choice of the seller	Which seller is the best?	Buyer's trust in seller and price premiums		Customers select trustworthy sellers even if their prices are higher.

Buyer's trust in seller had a significant positive effect on price premiums for expensive products, whereas the effect was not significant for inexpensive products. This suggests customers purchasing expensive products from C2C e-commerce may be willing to pay more for products from trustworthy sellers. However, buyer's trust in the seller did not provide price premium for inexpensive products, even though the case of eBay based on auction model provides price premium [2]. There may be other determinants of purchase decisions with respect to inexpensive products. The difference between Auction site and eBay is attributable to the price mechanism of transactions which is classified into the posted-price model and the auction model, and institution-based trust mechanisms as shown in Table 10.

6 Conclusion

This study can be distinguished from previous studies, e.g. [2], [29], in terms of the method used for calculating buyer's trust in seller. [2] used the number of positive or negative ratings for each seller on eBay. In the case of Auction, there were no significant differences in the level of buyer's trust in seller in terms of the three trust indices (i.e. the seller grade, purchase satisfaction, and seller assessment) because most sellers had good ratings. [29] added feedback comments to the number of positive or negative ratings as a proxy for buyer's trust in the seller. The content analysis of comments for each seller is subjective and tedious. However, our method for determining buyer's trust in seller standardizes many indicators in one dimension, differentiates between various levels of buyer's trust in seller, and simplifies the research model for a more efficient analysis of relationships between trust, price discounts and price premiums. Thus, the most important contribution of our study is to propose a new approach for calculating buyer's trust in seller in C2C e-commerce. C2C e-commerce is classified into the auction model and the posted-price model by their price-making mechanisms as described in the introduction. The second differentiation was to deal with the posted-price model instead of the auction model which was conducted by previous studies.

Our research provides new implications of consumer's purchase behavior and seller's strategies. We identified price discount effects in C2C e-commerce as well as the effect of buyer's trust in seller providing price premium. Buyer's trust in seller had a greater effect on price discounts for expensive products than for inexpensive products. That is, as buyer's trust in seller increases, price discounts decrease. As can be seen in model 3 of Table 5, product price as a moderator not only plays a role of an independent variable, but also changes the effect of buyer's trust in seller on price discount. As product price increases, bigger price discount is applied in C2C e-commerce because standardized coefficient of product price variable in model 2 of Table 5 is positive. Thus, we can infer that bigger discounts need to be applied to more expensive products, according to the perspectives of consumers in C2C e-commerce. Those purchasing a specific expensive product such as a multifunction device or an LCD-TV are likely to prefer trustworthy sellers offering little discount to untrustworthy sellers offering deep discounts in C2C e-commerce. Although no price premium exists in inexpensive standardized products, buyer's trust in seller renders price premiums in expensive products. Thus, successful sellers in C2C e-commerce should plan strategies to keep up with higher feedback ratings to obtain price premiums while they provide far more profound discounts compared to B2C e-commerce or offline malls. The ability and willingness of sellers in open marketplaces to offer bigger discounts is crucial because lower prices are generally a critical purchase motivation for most consumers [45].

Our research also points to implications in C2C e-commerce. In summary, C2C e-commerce such as Auction and eBay needs to include the following two factors in their business strategies. First, they need to establish more effective reputation systems, including feedback mechanisms, escrow services, rigorous regulations, and rules for sellers, among others. The institutional structures of C2C e-commerce can engender buyer's trust in seller [30]. Thus, institution-based trust can reduce uncertainty and opportunism and induce purchase intention. Second, C2C e-commerce should offer deeper price discounts than B2C e-commerce to maintain competitive advantage.

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This study has some limitations and suggests further researches. First, we did not include feedback comments in our measurement protocol for buyer's trust in seller. However, our method can easily consider text comments as a factor in calculating the trust function. First future research is to apply the method to a research model including feedback comments. Second, we considered only a few standardized products. Thus, future research examining the relationship between buyer's trust in seller and price premiums should consider product types (e.g. search and experience goods) as a moderator variable. Second future research is to extend the method to the area considering the product types. Third, this study did not exactly and completely consider buyer's trust in seller because feedback profiles or reputation represented as trust indices are a partial form of trust. Furthermore, there is a need for future research to extend this study's methodology by considering a wider range of C2C e-commerce. In future studies, we will also extend our research methodology to applications in a variety C2C e-commerce sites.

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http://www.auction.co.kr

Site 2: Macromill Embrain
http://www.embrain.com

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Appendix A: Importance of Trust Indexes in Sellers on Auction (Site 1)

1. In order to evaluate trust in a seller when you make a purchase on Auction,

1.1. How much more important do you think the seller's grade is than the purchase satisfaction?

Absolutely Important	Very Important	Rather Important	Equal	Rather Unimportant	Very Unimportant	Absolutely Unimportant
☐	☐	☐	☐	☐	☐	☐

1.2. How much more important do you think the seller's grade is than the seller's assessment/merchandise assessment?

Absolutely Important	Very Important	Rather Important	Equal	Rather Unimportant	Very Unimportant	Absolutely Unimportant
☐	☐	☐	☐	☐	☐	☐

1.3. How much more important do you think the purchase satisfaction is than the seller's assessment/merchandise assessment?

Absolutely Important	Very Important	Rather Important	Equal	Rather Unimportant	Very Unimportant	Absolutely Unimportant
☐	☐	☐	☐	☐	☐	☐

2. Referring to the seller grades given to a seller,

2.1. Below which grade do you think the seller is not trustworthy at all?

7	6	5	4	3	2	1
□VIP	□Diamond	□Sapphire	□Gold	□Silver	□Bronze	□Novice

2.2. Above which grade do you think the seller is trustworthy?

□VIP □Diamond □Sapphire □Gold □Silver □Bronze □Novice

2.3. Above which grade do you think the seller is absolutely trustworthy?

□VIP □Diamond □Sapphire □Gold □Silver □Bronze □Novice

3. Referring to the purchase satisfaction levels given to a seller

3.1. Below which level do you think the seller is not trustworthy at all?

8	7	6	5	4	3	2	1
□★★★★★	□★★★★½	□★★★★	□★★★½	□★★★	□★★½	□★★	□★

3.2. Above which level do you think the seller is rather trustworthy?

□★★★★★ □★★★★½ □★★★★ □★★★½ □★★★ □★★½ □★★ □★

3.3. Above which level do you think the seller is absolutely trustworthy?

□★★★★★ □★★★★½ □★★★★ □★★★½ □★★★ □★★½ □★★ □★

4. Referring to the seller's assessment/merchandise assessment given to a seller,

4.1. Below which score do you think the seller is not trustworthy at all?

5	4	3	2	1
□Highly Satisfactory (100 points)	□Satisfactory (80 points)	□Normal (60 points)	□Unsatisfactory (40 points)	□Highly Unsatisfactory (20 points)

4.2. Above which score do you think the seller is rather trustworthy?

□Highly Satisfactory (100 points) □Satisfactory (80 points) □Normal (60 points) □Unsatisfactory (40 points) □Highly Unsatisfactory (20 points)

4.3. Above which score do you think the seller is absolutely trustworthy?

□Highly Satisfactory (100 points) □Satisfactory (80 points) □Normal (60 points) □Unsatisfactory (40 points) □Highly Unsatisfactory (20 points)

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Appendix B: Sample Data of LCD TV (N = 41), Monetary Unit - Won

buyer's trust in the seller	Product price(won)	price premium(won)	price discount(won)			
2.686	800000	-15290.24	151670	815290.24	Average of product prices	
2.686	820000	4709.76	131670	951670 ($950)	Average market price	
2.686	828000	12709.76	123670			
1.701	815000	-290.24	136670			
0.500	730000	-85290.24	221670			
2.387	811000	-4290.24	140670			
2.088	819800	4509.76	131870			
2.088	830000	14709.76	121670			
2.088	840000	24709.76	111670			
2.088	810000	-5290.24	141670			
2.088	800000	-15290.24	151670			
2.686	859000	43709.76	92670			
2.686	820000	4709.76	131670			
2.686	816000	709.76	135670			
2.686	870000	54709.76	81670			
2.686	821000	5709.76	130670			
2.088	814000	-1290.24	137670			
1.701	804000	-11290.24	147670			
2.387	880000	64709.76	71670			
2.088	816000	709.76	135670			
2.686	781000	-34290.24	170670			
2.299	798000	-17290.24	153670			
2.686	810000	-5290.24	141670			
1.939	805000	-10290.24	146670			
2.686	810000	-5290.24	141670			
2.686	797000	-18290.24	154670			
2.686	809500	-5790.24	142170			
2.686	809800	-5490.24	141870			
2.686	819000	3709.76	132670			
2.387	810000	-5290.24	141670			
2.387	850000	34709.76	101670			
1.701	830000	14709.76	121670			
2.088	830000	14709.76	121670			
1.939	815000	-290.24	136670			
2.686	797000	-18290.24	154670			
2.299	809800	-5490.24	141870			
2.686	820000	4709.76	131670			
2.088	830000	14709.76	121670			
2.686	798000	-17290.24	153670			
2.686	797000	-18290.24	154670			
2.686	797000	-18290.24	154670			