

The Effect of Online External Reference Price on Perceived Price, Store Image, and Risk

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Previous research has shown that external reference prices provided by price comparison sites are known to increase both sellers' price competition and buyers' price sensitivity. However, there is no clear answer regarding the different impacts of various competition patterns, which are caused by the advent of competitors within price comparison sites, with respect to consumers' perceptions of price, store image, and risk. Our objective in this research is to investigate the effect of the external reference price within price comparison sites, which is determined by competitors' offering price, on perceived price, store image, and risk. In this research, we investigated whether perceived price, store image, and risk differ according to 1) store name (a known vs. unknown store); 2) brand name (a known vs. unknown brand); and 3) product category (look-and-feel vs. non-look-and-feel). Our results demonstrate that the effect of online external reference prices is significant on store image for an unknown store, regardless of product category. In addition, the effect of online external reference prices is significant on the price and risk perceptions for look-and-feel products, but not for non-look-and-feel products when the focal mall is an unknown store. However, the interaction effect on price perception disappears when the focal mall is a known store.

Keywords: Online Shopping; External Reference Price; Price Perception; Store Image Perception; Risk Perception; Store Name

JEL Classification: M31

I. Introduction

One of the biggest differences between online and offline shopping environments is the degree to which consumers compare prices. In online shopping environments, price comparison sites are widespread (Häubl and Trifts, 2000; Iyer and Pazgal, 2003; Pan, Ratchford, and Shankar, 2004). The presence of price comparison sites lowers consumers' search costs (Brynjolfsson and Smith, 2000). While online shopping has become a general trend, online retailers have a much harder time than ever finding a homerun strategy to defend themselves from cutthroat competition involving information on competitors' prices from price comparison sites, which function as external reference prices. Pretend for a moment that you own and manage an online shopping mall. When a famous competitor sells the same product online, what would be its impact on your customers? To be more specific, is the impact the same whether your store

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is as famous as the competitor or not? What if the location of the competitor is lower (i.e., showing a higher price within the price comparison sites than your price) or higher (i.e., showing a lower price within the price comparison sites than yours)? What if there is more than one famous competitor entering the online market with the same product that you carry in your online store?

Our objective in this research is to investigate the effect of the external reference price within price comparison sites, which is determined by competitors' offering price, on perceived price, store image, and risk. Many previous studies have examined the impact of external reference prices provided by price comparison sites in online purchasing behavior and price sensitivity. External reference prices provided by price comparison sites are known to increase both sellers' price competition and buyers' price sensitivity (Bakos, 1997; Degeratu, Rangaswamy, and Wu, 2000; Iyer and Pazgal, 2003; Shankar, Rangaswamy, and Pusateri, 1999). However, there is no clear answer regarding the different impacts of various competition patterns, which are caused by the advent of the competitors within price comparison sites, with respect to consumers' perceptions of price, store image, and risk. More specifically, we first investigate whether perceived price, store image, and risk differ according to 1) store name (a known vs. unknown store); 2) brand name (a known vs. unknown brand); and 3) product category (look-and-feel vs. non-look-and-feel). Then, under the significant conditions of the above-mentioned considerations (store brand, product brand, and category), we examine whether perceived price, store image, and risk differ by external reference price.

II. Conceptual Background and Hypotheses Development

A. Cue Utilization Theory

Consumers use various cues to infer product quality (Olson, 1973). Cue utilization theory provides an attractive framework through which to assess consumer perceptions of stores, brands, and products. These cues can be classified into extrinsic and intrinsic cues. While intrinsic cues are directly related to the nature and performance of physical products (e.g., ingredients, taste, smell, texture, and technical specifications), extrinsic cues are not related to product performance (Olson, 1972). When consumers make quality evaluations, they rely on extrinsic cues such as price (Leavitt, 1954), packaging (McDaniel and Baker, 1977), store name (Wheatley, Chiu, and Goldman, 1981), brand name (Allison and Uhl, 1964), and color (Peterson, 1977). A review of the literature suggests that consumers tend to use both intrinsic and extrinsic cues when evaluating products (Simonson, 1989; Szybillo and Jacoby, 1974).

B. Perceived Price

When making a purchase decision, consumers evaluate the price of a product based on some standard, which is known as a reference price (Emery, 1970; Monroe, 1973). Previous studies have proposed that internal reference prices rely on memory from prior purchases (Kalwani and Yim, 1992; Winer, 1986). As the reference price accumulates based on the average market price, fair price, or normal price compared to the actual price, it can serve as a point of comparison to judge whether the given price is acceptable, fair, high, or low (Grewal *et al.*, 1998; Mayhew and Winer, 1992; Monroe, 1990). As the internal reference is represented as a region rather than a point estimate, there exists latitude of price acceptance (Kalyanaram and Little,

1994; Monroe and Venkatesan, 1969; Sherif, Taub, and Hovland, 1958). This latitude is referred to as the acceptable price range with the identification of upper and lower limits (Monroe and Venkatesan, 1969). Kalyanaram and Little (1994) found the relationship between an internal reference price and an acceptable price range: consumers with higher average reference prices have wider acceptable price ranges. According to cue utilization theory, which conceptualizes products as an array of extrinsic and intrinsic cues serving as quality indicators, store name and brand name have an effect on product quality as extrinsic cues (Dodds, Monroe, and Grewal, 1991; Rao and Monroe, 1989). Rao and Monroe (1989) found a statistically significant positive relationship between price and quality perceptions. Thus, price perceptions can be explained by store name and brand name. Since uncertainty magnifies the impact of memory on setting internal reference prices (Monroe, 1971), uncertainty involved with the store and brand can influence consumers' price perceptions. Thus, we hypothesize the following:

H1-1: Online buyers have different (a) internal reference prices; and (b) acceptable price ranges by store name.

H1-2: Online buyers have different (a) internal reference prices; and (b) acceptable price ranges by brand name.

As an online shopping mall is a virtual environment, products in the online environment can be categorized as either sensory or non-sensory, depending on the product attributes (Degeratu, Rangaswamy, and Wu, 2000). In addition, de Figueiredo (2000) proposed the degree of easiness in evaluating a product on the Web, from non-look-and-feel to look-and-feel goods. This study adopts de Figueiredo (2000)'s classification of product categories: non-look-and-feel vs. look-and-feel. Non-look-and-feel goods that have fewer sensory attributes (e.g., commodity and quasi-commodity products such as computers) have characteristics similar to information-oriented products that consumers often pursue in order to meet utilitarian goals. On the contrary, look-and-feel goods (e.g., clothing) are similar to emotion-oriented products with hedonic goals. As price is one of the representative non-look-and-feel product attributes, compared to look-and-feel products, consumers' decisions on non-look-and-feel type products involve their cognition more than their affection or emotion. Based on this relationship, consumers' sensitivity on price perceptions may vary by product category. Therefore, we hypothesize the following:

H1-3: Online buyers have different (a) internal reference prices; and (b) acceptable price ranges by product category.

C. Perceived Store Image

As competition in the market is more and more accelerated, store image becomes an important component in the consumer's decision-making process (Nevin and Houston, 1980), and many stores try to alter their image in order to remain competitive (Grewal *et al.*, 1998). In traditional offline settings, store image includes the physical environment of the store, service quality, and merchandise quality (Boulding *et al.*, 1993; Zeithaml, Berry, and Parasuraman, 1996). In online environments, the competition is more severe, the entry barrier to the market is much lower, and consumers have easy access to information on stores so that the role of perceived store image may be more important. As in offline stores, the more positive the store name, the more positive the consumer's perceived store image is (Grewal *et al.*, 1998; Keaveney and Hunt, 1992). Likewise, there exists the positive effect of brand name on product quality perceptions (Richardson, Dick, and Jain, 1994), which is part of the store image. According to cue utilization theory, brand name and store name are frequently used by consumers as a

composite of information (Olson, 1976). Zimmer and Golden (1988) found that consumers use store names to describe a prototypical store (e.g., "Like Sears"), which is a form of the category-based processing perspective of store image suggested by Keaveney and Hunt (1992). In addition, Jacoby and Mazursky (1984) found that retailers with an unfavorable image could improve that image by carrying brands with a more favorable image. Thus, we hypothesize the following:

H2-1. Online buyers form different store image perceptions by store name.

H2-2. Online buyers form different store image perceptions by brand name.

D. Perceived Risk

Perceived risk refers to consumers' perceptions of the uncertainty and concomitant adverse consequences of buying a product (Dowling and Staelin, 1994). Compared to the offline shopping environment, where consumers check and receive the product at the point of sale, the online shopping environment does not satisfy this condition, so that the overall perceived risk in the online shopping environment is greater. As consumers tend to perceive an online store with a good reputation as being more trustworthy and credible than one with a poor reputation, an online store's reputation can foster perceived risks such as financial, performance, and privacy risk (Chen and Dubinsky, 2003). In addition, as the product quality increases, uncertainty associated with the store, such as performance risk, decreases (Chen and Dubinsky, 2003; Sweeney, Soutar, and Johnson, 1999). Moreover, de Figueiredo (2000) explained that the degree of easiness in evaluating a product on the Web (from non-look-and-feel to look-and-feel goods) affects the consumer's information searching process. For look-and-feel type products, the purchasing process is more involved with sensory information than for non-look-and-feel type products. Since online shopping sites do not provide as much sensory information as offline shopping (such as touching, feeling, trying on, or seeing actual products in person), the perceived risk from look-and-feel type products is higher than that from non-look-and-feel type products. Thus, we hypothesize the following:

H3-1. Online buyers have different perceived risk by store name.

H3-2. Online buyers have different perceived risk by brand name.

H3-3. Online buyers have different perceived risk by product category.

E. External Reference Price

Kalyanaram and Winer (1995) divided reference prices into two types: internal and external. While internal reference prices rely on one's memory from prior purchases (Kalwani and Yim, 1992; Winer, 1986), external reference prices are provided in the purchase environment, such as the price tags of competing products on the shelf. According to Grewal, Marmorstein, and Sharma (1996), when consumers are in a store, a within-store comparison results in greater perceptions of value than a between-store comparison, whereas a between-store comparison is more effective than a within-store comparison when consumers are at home. Compared with traditional offline stores, the conditions of online stores with external reference prices are similar to those when consumers are at home so that between-store comparisons will be more effective.

If the focal mall is a well-known store, the advent of a famous competitor is not a significant threat, and it does not intensify the competition, since the store name enhances buyers'

perceptions on the perceived price, product evaluation, and store image so that the buyers do not perceive the differences (Dodds, 1991). On the other hand, when consumers shop at an unknown store, if a famous competitor's price is shown as an external reference price (ERP), there may be damage done to the image of the unknown store, as consumers can easily perceive the differences in the store name (Dodds, Monroe, and Grewal, 1991; Rao and Monroe, 1989). For price and risk perceptions, the effect would be minimal for non-look-and-feel products, since they are information-oriented products to meet consumers' utilitarian goals based on intrinsic cues. However, the effect of external reference prices may be significant on consumers' decisions about look-and-feel type products, as these products involve more extrinsic cues (de Figueiredo, 2000). Thus, we propose our hypotheses as the following:

H4-1: When online buyers shop at an unknown mall (a known mall), the effect of external reference prices (ERP) on price perceptions differs (does not differ) by product category.

H4-2: When online buyers shop at an unknown mall (a known mall), the effect of external reference prices (ERP) on store image differs (does not differ), regardless of product category.

H4-3: When online buyers shop at an unknown mall (a known mall), the effect of external reference prices (ERP) on risk perceptions differs (does not differ) by product category.

III. Experiments

A. Study 1: The Effects of Store Name, Brand Name, and Product Category

This study uses a 2 (store name: known vs. unknown) x 2 (brand name: known vs. unknown) x 2 (product category: look-and-feel vs. non-look-and-feel) factorial design to test the proposed hypotheses. Store name and brand name are between-subject factors and product category is manipulated as a within-subject factor. We hired a professional market research agency in Korea to conduct this experiment by using its online panel members. This study used experimental materials developed to reflect a hypothetical online shopping situation posted on the website of the research agency. A total 160 subjects participated in this study. We screened out subjects who did not have online purchasing experience within the past three months, and we had an equal quota for gender. Table 1 summarizes the key demographics and online shopping experiences of the subjects: they are relatively young (51.2% are in their 20s) and have fairly good online shopping experience.

Table 1: Subject Profiles on Key Demographics and Internet Buying Experiences (Study 1)

Demographics		Percentage	Internet buying experiences		Percentage
Gender	Male	40.0%	Internet shopping period	Less than 1yr	1.9%
	Female	60.0%		1~2 yrs	5.6%
Age	Less than 20	16.3%	2~3 yrs	13.1%	
	21~25	30.6%	3~4 yrs	19.4%	
	26~30	20.6%	4+ yrs	60.0%	
	31~35	16.3%	Internet shopping frequencies during past 3 months	1~3	29.4%
	More than 35	16.2%		4~6	31.3%
Income	Less than 1m	39.3%	7~9	16.8%	
	1m~1.99m	26.3%	10+	22.5%	
	2m~2.99m	16.8%	Purchase experience of digital products	Yes	70.0%
	3m~3.99m	10.6%		No	30.0%
	More than 4m	6.9%	Purchase experience of clothing products	Yes	89.4%
		No		10.6%	

To manipulate the known and unknown shopping malls, we used the well-known CJ mall for the known shopping mall and made up a fictitious shopping mall for the unknown shopping mall. For the two product categories, notebook computers and jeans were used for the non-look-and-feel and the look-and-feel categories, respectively. We selected these two categories after evaluating the easiness of quality judgments in the online shopping context among the most frequently purchased product categories reported by Ernst & Young (2001). For each product category, two brands were chosen: Samsung Sense and a fictitious brand for notebook computers, and Levi's and a fictitious brand for jeans.

When subjects click on the experiment link to participate, they are randomly assigned to four sites (2 store names x 2 brand names). Then, the subjects are asked to assume a situation in which they need a product for their personal use, and they decide to purchase it online. For this study, we prepare web pages almost like a real shipping environment. In the shopping mall, we provide the product and price information of the target items, where the price of the target item is set at the middle of the five price levels provided. All subjects then move to the questionnaire pages for the measurement of price, store image, and risk perceptions. At this stage, they are not allowed to go back to the product information. Except for the store and brand name, all other aspects, including web design and price, are identical. Each subject completes the tasks for both product categories, and the order of the product category is counterbalanced.

Two price perceptions are measured. Internal Reference Price (IRP) is measured by the mean value of three price estimations on the average market price and fair price, as used by Grewal *et al.* (1998). Acceptable Price Range (APR) is the gap between the maximum acceptable price and the minimum acceptable price (Lichtenstein, Bloch, and Black, 1988; Lii and Lee, 2005; Monroe, 1971) and is calculated from the subjects' responses on the maximum and minimum acceptable price estimations. Because of the difference in the price level between the product categories, we convert the price measure to a percentage deviation from the target price of each product category to make the comparison between the product categories comparable (Simonin and Ruth, 1995). The perception measures of store image and risk are measured using a seven-point Likert scale, based on the items used by Grewal *et al.* (1998) and Jarvenpaa and Tractinsky (1999). As reported in Table 2, Cronbach's alphas of all variables are well above the reliability standard value of 0.7.

Table 2: Scale Items of Dependent Measures

Items	Reliability	
	Notebook	Jeans
Internal reference price (Grewal <i>et al.</i>, 1998)	0.77	0.77
The normal price of the product would be _____.		
The average market price of the product would be _____.		
_____ would be the fair price of the product.		
Maximum acceptable price	-	-
I am willing to pay a maximum amount of _____ to buy this product.		
Minimum acceptable price	-	-
I think I have to pay a minimum amount of _____ to buy this product.		
Perceived store image (Grewal <i>et al.</i>, 1998)	0.89	0.91
Provide accurate product information		
Provide good overall service		
Provide helpful service		
Carry high-quality merchandise		
Perceived risk (Jarvenpaa <i>et al.</i>, 1999)	0.89	0.90
How would you characterize the decision of whether to buy a product from this web retailer? (significant opportunity / significant risk)		
How would you characterize the decision of whether to buy a product from this web retailer? (very positive situation / very negative situation)		
How would you characterize the decision of whether to buy a product from this web retailer? (very high potential for gain / very high potential for loss)		

B. Study 2: The Effects of Online External Reference Prices

This study uses a 2 (store name: unknown vs. known) x 2 (product category: look-and-feel vs. non-look-and-feel) x 4 (ERP: non vs. above vs. below vs. above & below) factorial design to test the proposed hypotheses. We manipulate store name and product category similarly to what we have done in Study 1. Using the same online panel as in Study 1, a total of 320 subjects participated in this study. The sample profiles are very similar to those from Study 1. Details about the sample profile are summarized in Table 3.

Table 3: Subject Profiles on Key Demographics and Internet Buying Experiences (Study 2)

Demographics		Percentage	Internet buying experiences		Percentage
Gender	Male	46.9%	Internet shopping period	Less than 1 yr	1.8%
	Female	53.1%		1~2 yrs	6.3%
Age	Less than 20	10.3%		2~3 yrs	19.1%
	21~25	24.7%		3~4 yrs	17.5%
	26~30	18.4%		4+ yrs	55.3%
	31~35	16.6%	Internet shopping frequencies during past 3 months	1~3	30.3%
	More than 35	30.0%		4~6	30.0%
Income	Less than 1m	30.6%		7~9	13.4%
	1m~1.99m	24.7%	10+	26.3%	
	2m~2.99m	23.1%	Purchase experience of digital products	Yes	69.1%
	3m~3.99m	10.9%		No	30.9%
	More than 4m	10.7%	Purchase experience of clothing products	Yes	85.6%
		No		14.4%	

As in Study 1, the price of the focal mall is set at the middle of the five price levels provided. While all of the external prices are unknown in Study 1, some stores in Study 2 can be famous, based on the given conditions of none, above (lower price), below (higher price), and above & below (lower and higher price). As the effect of store name was significant in Study 1, we divide our analysis into the case when the focal mall is unknown and known.

IV. Results

A. Study 1: The Effects of Store Name, Brand Name, and Product Category

Table 4 shows a summary of the descriptive statistics on the dependent measures. To test the predicted effects as a multivariate level (perceived price, store image, and risk), a MANOVA test is conducted first using SPSS. As shown in Table 5, MANOVA results show significant main effects of product category and store name, providing supporting evidence for H1-1, H2-1, H3-1, H1-3, and H3-3 at the multivariate level. The effects are further investigated using univariate analysis for significant effects at the multivariate level. Table 6 summarizes the univariate ANOVA results for all four dependent variables. First, the results of the main effects show that the effect of product category is significant for the internal reference price and the acceptable price range ($F=16.30$, $p<.01$), thereby supporting H1-3 (a) and H1-3 (b), but failing to support H3-3. The univariate ANOVA results of store name show significant effects on the internal reference price ($F=7.99$, $p<.01$), store image ($F=19.69$, $p<.01$), and risk ($F=22.93$, $p<.01$), thereby supporting H1-1 (a), H2-1, and H3-1, but failing to support H 1-1 (b). However, the effects of brand name are insignificant on price, store image, and risk perceptions, thereby failing to support H1-2 (a), H1-2(b), H2-2, and H3-2.

Based on Study 1, we can conclude that 1) the internal reference price is different by store name (the internal reference is lower for customers using known stores); 2) the internal reference price is different by product category (the internal reference price is lower for the look-and-feel product); 3) the acceptable price range is different by product category (the acceptable price range is wider for the look-and-feel type product); 4) the perceived store image is different

by store name (store image is better for the known store); and 5) the perceived risk is different by store name (the perceived risk is smaller for the known store).

Table 4: Means and Standard Deviations of Perception Measures of Price, Store Image, and Risk

	Notebook					Jeans				
	Store		Brand		Total	Store		Brand		Total
	Unknown	Known	Unknown	Known		Unknown	Known	Unknown	Known	
<u>Price perceptions</u>										
Internal reference price (IRP)	-0.031 (0.098)	-0.063 (0.098)	-0.057 (0.103)	-0.036 (0.094)	-0.047 (0.099)	-0.060 (0.167)	-0.135 (0.192)	-0.120 (0.165)	-0.075 (0.198)	-0.098 (0.183)
Acceptable price range (APR)	0.084 (0.092)	0.077 (0.073)	0.078 (0.061)	0.083 (0.101)	0.081 (0.083)	0.125 (0.116)	0.136 (0.097)	0.130 (0.098)	0.131 (0.116)	0.131 (0.107)
<u>Store image perception</u>	3.894 (0.949)	4.678 (1.193)	4.450 (1.167)	4.122 (1.103)	4.286 (1.144)	3.881 (1.010)	4.519 (1.281)	4.238 (1.272)	4.163 (1.116)	4.200 (1.193)
<u>Risk perception</u>	3.496 (1.260)	2.617 (1.188)	2.975 (1.328)	3.138 (1.270)	3.056 (1.298)	3.613 (1.432)	2.721 (1.247)	3.179 (1.481)	3.154 (1.347)	3.167 (1.411)

* Price measure was converted to a percentage deviation from the actual price. It was calculated as: (price-estimate - actual price of the target product)/actual price of the target product.

* Scale measures represent average responses from a 7-point Likert scale.

Table 5: MANOVA Results

Source	Pillai's trace	Wilks' lambda	Hotelling's trace
<u>Main effects</u>			
Product category (Cat)	.273**	.727**	.376**
Store name (SN)	.209**	.791*	.265**
Brand name (BN)	.033	.967	.034
<u>2-way interactions</u>			
Cat x SN	.031	.969	.032
Cat x BN	.029	.971	.030
SN x BN	.008	.992	.008
<u>3-way interactions</u>			
Cat x SN x BN	.006	.994	.006

Note: *:p<.05, **:p<.01.

Table 6: Univariate ANOVA Results

Source	df	F value			
		Internal reference price	Acceptable price range	Store image perception	Risk perception
<u>Main effects</u>					
Product category (Cat)	1	16.301**	32.559**	1.370	1.630
Store name (SN)	1	7.989**	.024	19.690**	22.934**
Brand name (BN)	1	2.979	.052	1.583	.138
<u>2-way interactions</u>					
Cat x SN	1	2.917	.945	1.000	.005
Cat x BN	1	.885	.055	2.972	1.175
SN x BN	1	.296	.064	.687	.257
<u>3-way interactions</u>					
Cat x SN x BN	1	.100	.430	.330	.005

Note: *.p<.05, **.p<.01.

A. Study 2: The Effects of Online External Reference Prices

Tables 7 and 8 show the summary of the descriptive statistics on the dependent measures when the focal mall is known and unknown, respectively.

Table 7. Means and Standard Deviations of Perception Measures of Price, Store Image, and Risk in Known Focal Mall

ERP by famous competitor	Notebook					Jeans				
	No	Above	Below	Above & below	Total	No	Above	Below	Above & below	Total
<u>Price perceptions</u>										
Internal reference price (IRP)	-0.045	-0.033	-0.029	-0.051	-0.04	-0.127	-0.092	-0.155	-0.113	-0.121
	-0.094	-0.092	-0.07	-0.085	-0.086	-0.124	-0.144	-0.181	-0.159	-0.154
Acceptable price range (APR)	0.075	0.082	0.091	0.066	0.078	0.102	0.136	0.136	0.133	0.127
	-0.077	-0.067	-0.057	-0.046	-0.063	-0.093	-0.115	-0.098	-0.112	-0.105
<u>Store image perception</u>	4.781	4.638	4.613	4.294	4.581	4.506	4.4	4.531	4.381	4.455
	-1.011	-1.138	-0.65	-0.868	-0.943	-1.072	-1.174	-0.946	-0.845	-1.009
<u>Risk perception</u>	3.05	2.542	2.725	3.025	2.835	2.975	3.158	3.058	3.142	3.083
	-1.19	-1.265	-1.247	-1.092	-1.208	-1.266	-1.408	-1.325	-1.164	-1.284

* Price measure was converted to a percentage deviation from the actual price. It was of the target product.

* Scale measures represent average responses from a 7-point Likert scale.

Table 8: Means and Standard Deviations of Perception Measures of Price, Store Image, and Risk in Unknown Focal Mall

ERP by famous competitor	Notebook					Jeans				
	No	Above	Below	Above & below	Total	No	Above	Below	Above & below	Total
<u>Price perceptions</u>										
Internal reference price (IRP)	-0.039 (0.081)	-0.034 (0.074)	-0.037 (0.109)	-0.041 (0.098)	-0.038 (0.091)	-0.156 (0.131)	-0.089 (0.165)	-0.086 (0.161)	-0.073 (0.167)	-0.101 (0.158)
Acceptable price range (APR)	0.090 (0.079)	0.070 (0.046)	0.076 (0.059)	0.066 (0.060)	0.076 (0.062)	0.135 (0.078)	0.133 (0.111)	0.160 (0.107)	0.108 (0.106)	0.134 (0.102)
<u>Store image perception</u>										
	4.256 (0.730)	4.069 (0.738)	3.900 (0.718)	4.125 (1.059)	4.088 (0.826)	4.356 (0.695)	3.981 (0.785)	3.738 (0.707)	4.031 (1.067)	4.027 (0.849)
<u>Risk perception</u>										
	3.525 (1.137)	3.517 (1.222)	3.675 (0.986)	3.658 (1.218)	3.594 (1.136)	4.308 (1.128)	4.083 (1.219)	3.717 (1.093)	3.425 (1.219)	3.883 (1.204)

* Price measure was converted to a percentage deviation from the actual price. It was calculated as: (price-estimate - actual price of the target product)/actual price of the target product.

To test the predicted effects at a multivariate level (perceived price, store image, and risk), two MANOVA tests are conducted using SPSS for known and unknown focal malls, respectively. MANOVA results for both known and unknown focal malls, as shown in Tables 9 and 11, show significant main effects of product category and significant 2-way interaction effects of product category and ERP at the multivariate level. In addition, when the focal mall is unknown, the results show significant main effects of ERP. The effects are further investigated using univariate analysis for significant effects at the multivariate level. Tables 10 and 12 summarize the univariate ANOVA results for all four dependent variables. The results from the two univariate ANOVAs confirm H1-3 (a) and H1-3 (b), which is consistent with the results from Study 1. While H3-3 was not supported in Study 1, Study 2 demonstrates that online buyers have different perceived risk by product category, which finds that consumers perceive more risk when purchasing look-and-feel goods.

For the known focal mall, all main effects of ERP are insignificant, and the 2-way interaction effects of category and ERP are insignificant on price perceptions and store image, thereby supporting H4-1 and H4-2. On the other hand, when the focal mall is unknown, the main effect of ERP is significant for store image, supporting H4-2, and the 2-way interaction effects of category and ERP are significant on internal reference price and risk perception, thereby supporting H4-1 and H4-3.

Table 9: MANOVA Results for Known Focal Mall

Source	Pillai's trace	Wilks' lambda	Hotelling's trace
<u>Main effects</u>			
Product category (Cat)	.411**	.589**	.699**
External reference price	.051	.950	.052
<u>2-way interactions</u>			
Cat x ERP	.142*	.865*	.149*

Note: *:p<.05, **:p<.01.

Table 10: Univariate ANOVA Results for Known Focal Mall

Source	df	F value			
		Internal reference price	Acceptable price range	Store image perception	Risk perception
<u>Main effects</u>					
Product category (Cat)	1	57.336**	38.662**	3.805	7.93**
External reference price	1	.621	.955	.871	.371
<u>2-way interactions</u>					
Cat x ERP	1	2.003	1.138	1.627	2.847*

Note: *:p<.05, **:p<.01.

Table 11: MANOVA Results for Unknown Focal Mall

Source	Pillai's trace	Wilks' lambda	Hotelling's trace
<u>Main effects</u>			
Product category (Cat)	.440**	.560**	.787**
External reference price	.151*	.854*	.166*
<u>2-way interactions</u>			
Cat x ERP	.190*	.817*	.216*

Note: *:p<.05, **:p<.01.

Table 12: Univariate ANOVA Results Unknown Focal Mall

Source	df	F value			
		Internal reference price	Acceptable price range	Store image perception	Risk perception
<u>Main effects</u>					
Product category (Cat)	1	39.004**	71.042**	.947	6.642*
External reference price	1	1.154	1.442	3.057*	1.222
<u>2-way interactions</u>					
Cat x ERP	1	3.391*	1.984	.808	4.326*

Note: *:p<.05, **:p<.01.

As shown in Figure 1, when the focal mall is unknown, there exists a significant difference in perceived store image by ERP. This figure explains that the store image is highest when there is no famous ERP. With the advent of the famous ERP, the store image of the unknown focal malls underwent some damage, which is in line with H4-2. Figures 2 and 3 demonstrate the interaction effects of product category and ERP on the IRP (internal reference price) deviation and risk perceptions, respectively. When consumers purchase look-and-feel products, if there is no famous competitor as an ERP, they form the lowest IRP, and this IRP increases as the ERP of the famous competitor is provided. On the other hand, there is no difference in the IRP for non-look-and-feel products. Figure 3 shows that the perceived risk for look-and-feel products decreases with the advent of the ERP. These results support H4-1 and H4-3.

Figure 1: The Effect of ERP on Store Image in the Unknown Focal Mall

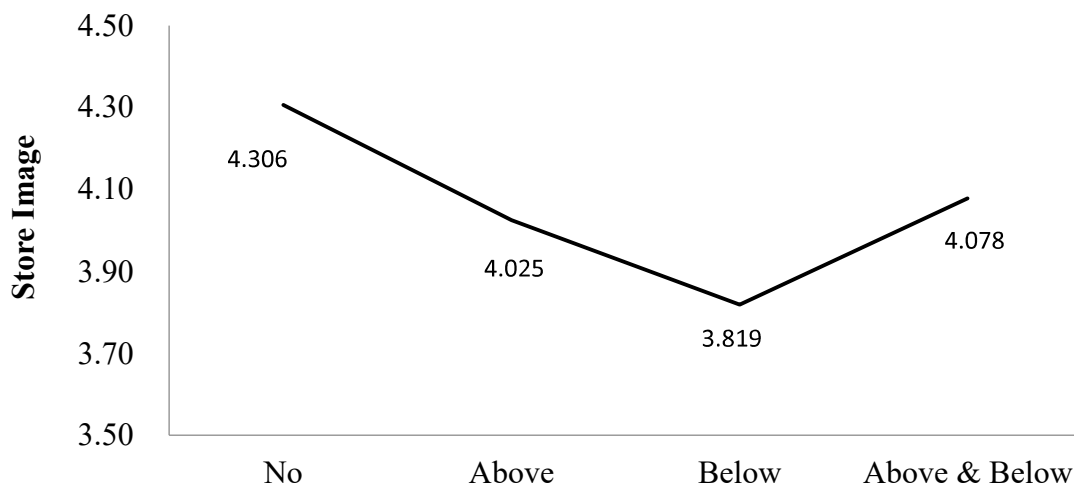


Figure 2: The Effect of ERP by Product Category on IRP Deviation in the Unknown Focal Mall

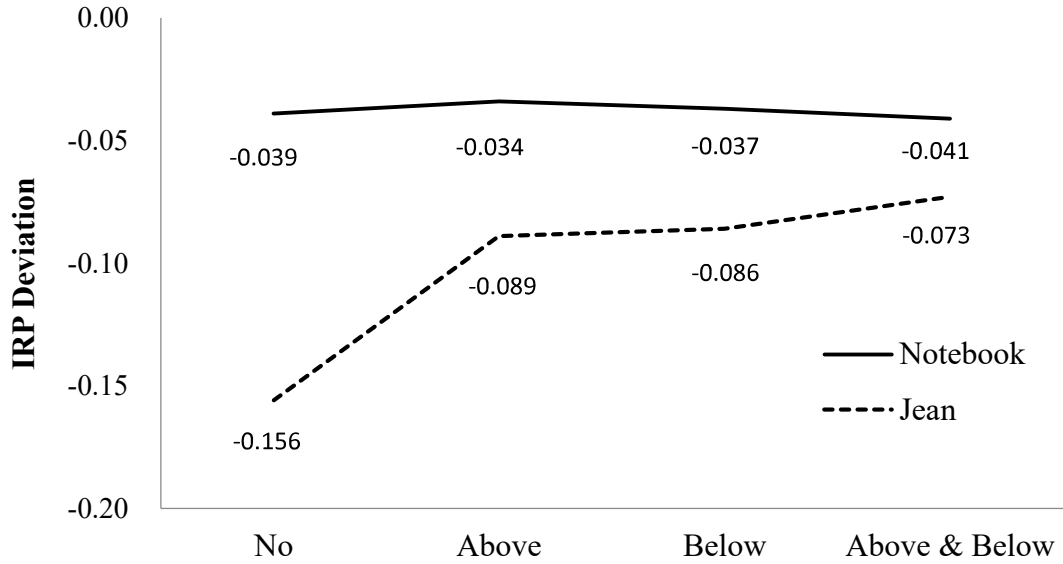
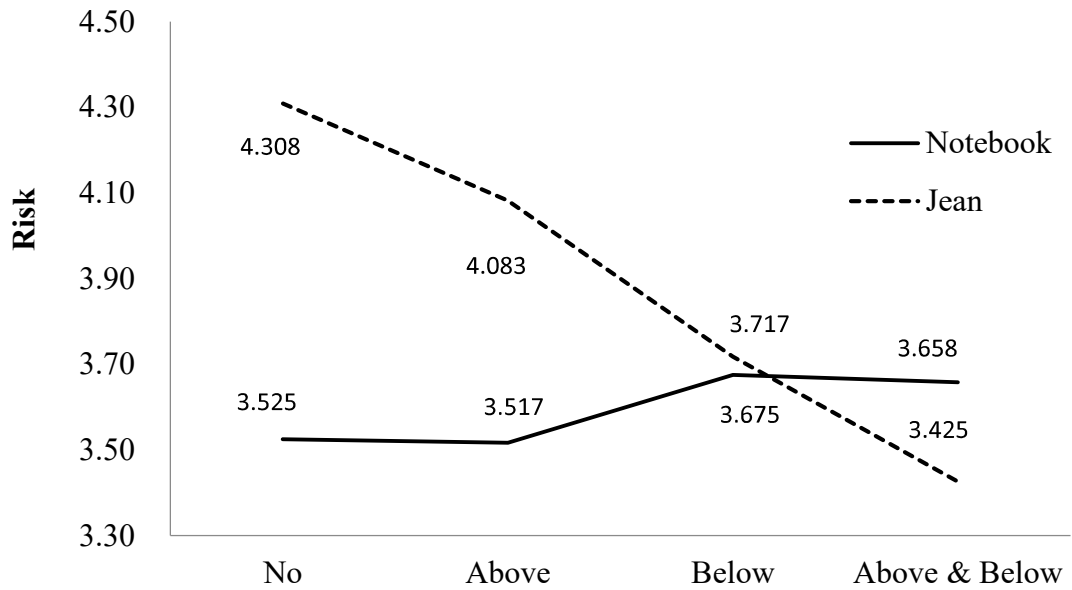


Figure 3: The Effect of ERP by Product Category on Risk in the Unknown Focal Mall



In sum, when consumers shop at an unknown store, the effect of ERP is different on store image, regardless of product category. In addition, the effect of ERP on perceived price and risk differs by product category (the effect of online external reference price is significant on the price and risk perceptions for look-and-feel products, but not for non-look-and-feel products). However, at a known store, the interaction effect on price perception disappears.

V. Discussion

Marketers for online shopping malls try to manage informational cues (price, store name, brand name, and product category) to derive better business performance through improved perceptions of price, store image, and risk. However, previous studies suggest external reference prices provided by price comparison sites are known to increase both sellers' price competition and buyers' price sensitivity by lowering search costs. However, they do not clearly provide answers to managers on how to deal with cutthroat competition (stores cannot keep decreasing the price).

This research seeks to address the limitations of previous research on price comparison sites by investigating the effect of external reference price within price comparison sites, which is determined by competitors' number and price, on the perceived price, store image, and risk. Based on cue utilization theory, we examined the effect of ERP on price, store image, and risk perceptions based on two studies and found moderating effects of product category and store name.

In addition to its theoretical contribution, the results of this research provide managerial implications for store managers, as they can predict what will happen in terms of consumers' perceptions on price, store image, and risk when the market situation changes. For example, when there is more competition in the market as competitors sell the same product online, it is a threat. However, managers cannot continuously lower the price to maintain a higher (more advantageous) location on the price comparison site. Based on our research, if the store is a well-known one, managers have no need to aggressively lower the price and reduce the margin, as the online external price does not impact on customers' price perceptions, store image, and risk. However, when the store is unknown, the confrontational strategy should be different, as the advent of other competitors diminishes the image of the unknown store. If the store sells look-and-feel products such as clothing, the manager may need to make efforts to improve not only the perceived price, but also the risk. However, if it is a non-look-and-feel product, such as an electronic device, the manager may need to focus on handling the perceived price.

Although this study provides meaningful theoretical and managerial insights into the effect of external reference prices, there are some limitations. First, this study examined the effect of external reference prices on price, store image, and risk perceptions in just two product categories. Future studies may examine various other product categories. Second, we used five stores and their prices as external references. However, online shopping malls provide more information, such as consumer reviews, merchant ratings, and shipping costs. This additional information may provide much richer theoretical and managerial implications in making strategic decisions for online stores. Third, this study only considers the online environment. However, these days, many companies sell products both online and offline to convince their customers to buy the products as customers look for information online and then purchase them offline after feeling, touching, and seeing the products by themselves. While this haptic sense (Klatzky and Lederman, 1992 and 1993; Lederman and Klatzky, 1987; Peck and Childers, 2003)

and hybrid nature of online and offline stores were not the focus of this study, given the wealth of research in the area, future research may develop a hybrid store environment (online with offline stores) based on the concept of haptic sense.

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