

Consumer Perceptions of Price Reframing in an In-Store Decision Context

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Abstract

This article compares consumer responses to price reframing methods in an in-store decision context where price comparisons among brands can be conducted. The methods examined are measure-based unit pricing, usage-based unit pricing, and temporal reframing of price. They differ in the unit used for calculating reframed prices: measure-based unit pricing uses weight or volume, usage-based unit pricing uses usage account, and temporal reframing of price uses time. This area of research has not been fully explored. Results from a laboratory experiment showed that measure-based and usage-based unit pricings were evaluated better than temporal reframing of price on usability, likeability, and comprehensibility. Also, measure-based unit pricing was the best at making the choice perceived easier, whereas usage-based unit pricing was the best at increasing the attractiveness of retail prices. Moreover, consumers who chose the brand with the lowest reframed price generated favorable price and quality perceptions for the chosen brand when usage-based unit pricing or temporal reframing of price was used but generated only favorable price perception when measure-based unit pricing was used.

JEL Classifications: M31, C91

Keywords: Price reframing, unit pricing, temporal reframing of price, price perceptions, in-store decision context

1. Introduction

1.1. Introduce the Problem

Price-reframing is a way of describing retail prices in a different form. It adopts a per-unit calculation so that the reframed prices can generate different consumers' perceptions of the retail prices. One common

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method is measure-based unit pricing [UP], which uses weight or volume as the unit (e.g., \$3.85 per gram). Grocery retailers began to use this UP in the 1970s in the U.S. as the UP Law required them to provide more detailed and accurate information regarding retail prices (Isakson & Maurizi, 1973; Monroe & LaPlaca, 1972). This resulted from the fact that many similar products are sold in different sizes and comparisons of their prices do not always lead consumers to lower-priced products. Later, Jr. Kwortnik, Creyer, and Jr. Ross (2006) proposed a new method, called usage-based UP, which used the rate at which the product was consumed as the unit (e.g., \$3.85 per wash load). Jr. Kwortnik *et al.* argued that this method was useful when usage rates were related to determining product value. Around the same time, Gourville (2003) introduced a third alternative, called temporal reframing of price (TRP). TRP reframes retail prices to a series of small ongoing expenses by using temporal units that consumers use in everyday life. Typical temporal units are per day (e.g., \$1.85 a day), per week (e.g., \$12.95 a week), per month (e.g., \$55.50 a month), and per year (e.g., \$675.25 a year). In essence, there are three possible methods of price reframing: measure-based UP, usage-based UP, and TRP.

1.2. Importance of the Topic

Although the three methods are the same in that they all reframe retail prices, consumers' responses are likely to vary among them because they have different meanings. Exploring these differences is an interesting research topic because the analysis may help us to gain knowledge on the power and effectiveness of each method more precisely. Nevertheless, this research issue has not drawn the attention of consumer behavior researchers. Focusing on this issue, Shirai (2017) took the initiative and conducted the first empirical study, which compared the three methods in a stand-alone decision context in which a target product was presented solely in a print advertisement. The results showed that usage-based UP and TRP received similar favorable evaluations on the attractiveness of retail price, price perception, and purchase intention. In addition, usage-based UP received the highest evaluation with regard to ease of understanding and preference. The use of measure-based UP was shown to be inappropriate in this context.

This article further investigates consumers' responses to the three methods, but from a different aspect. Here, we adopt another context, namely, an in-store context in which a set of similar products are displayed together. Impacts of price-reframing methods in this context have remained largely unexplored and an investigation thereof should contribute to a deeper understanding of the effects. Retailers are always looking for tactics to make their products more attractive and increase consumers' purchase intentions at a lower cost. The methods described here may have the potential to play such a role since reductions in actual retail prices are unnecessary. Moreover, the use of measure-based UP by grocery retailers has a long history and is quite familiar to many consumers. Some consumers may take such commonplace information for granted. Examining whether consumers still find measure-based UP useful and exploring alternative methods of price reframing that consumers may find preferable are interesting and relevant topics. Thus, this investigation may be of practical value as well. In doing so, we demonstrate that not only measure-based UP, but also usage-based UP has the potential to elicit positive responses from consumers when its reframed prices are displayed in a store.

The remainder of this article is organized as follows. First, an overview of the literature on UP and TRP is provided. Next, our hypotheses are presented, and a study and its results are described. Finally, the findings and implications of the study are discussed.

2. Background and Hypotheses

2.1. Research on UP

Much of the early research on measure-based UP has attempted to verify its effectiveness. The reported results have been inconsistent. Some studies found that unit prices did not lead consumers to buy lower

unit-priced products (Block, Schooler, & Erickson, 1971; McCullough & Padberg, 1971). Monroe and LaPlaca (1972) reviewed eight different studies and concluded that a shift to lower unit-priced products was observed in only some of them. However, an analysis of selections among different package sizes confirmed that consumers shifted to the size with the best value (Granger & Billson, 1972). Subsequent replication studies revealed awareness and usage of unit prices increased substantially overtime (Aaker & Ford, 1983; McElroy & Aaker, 1979).

The relationship between consumer characteristics and the use of unit prices was examined by several researchers. Isakson and Maurizi (1973) found that middle- and high-income consumers were more likely to use unit prices than low-income consumers. Houston (1972), and Gatewood and Perloff (1973) found that consumers used unit prices when they were consciously purchasing the most economical brand and size. Moreover, unit prices were found to activate motivation to select cheaper products for consumers who had a low level of price consciousness (Yao & Oppewal, 2016a), and to reduce perceptions of information overload (Yao & Oppewal, 2016b).

The formatting of unit prices was considered by some studies. The use of a single list displaying all the brands' sizes and unit prices was found to lead consumers to buy lower unit-priced products more often (Russo, Krieser, & Miyashita, 1975; Russo, 1977). Miyazaki, Spratt, and Manning (2000) found that the prominence of unit prices could increase consumers' usage.

An initial study on usage-based UP was conducted by Jr. Kwornik *et al.* (2006). In the study, usage-based unit prices were included in a context where measure-based unit prices were presented. They examined the scenario where usage-based unit prices determined the value of products and revealed that measure-based unit prices reduced consumers' ability of finding products with lower usage-based unit prices.

More recently, unit prices were found to be more informative than retail prices in enabling inferences about quality (Yan, Sengupta, & Jr. Wyer, 2014). In sum, a void in the research of this topic is that less attention has been devoted to investigating effectiveness of different UP methods on consumers' perceptions.

2.2. Research on TRP

What is known so far about the effects of TRP on consumers? Initially, research focused on a per day form, referred to as a "pennies-a-day" strategy. In an initial study, Gourville (1998) showed that consumers' likelihood of making a donation increased when the amount was expressed in the per day form, resulting in the donation amount appearing very small. In a subsequent study, Gourville (1999) found that a per day form generated higher perceived value for services consumed on an ongoing basis (e.g., one year's cellular telephone service) than services consumed on a lump sum basis (e.g., a round-trip airline ticket). In addition to a per day form, Gourville (2003) focused on a per month form and compared the two alternatives to a per year form (aggregate amount), and found that both per day and per month forms were preferred to a per year form.

Bambauer-Sachse and Mangold (2009) focused on the negative side of TRP. They found that although TRP could generate higher perceived price attractiveness, it could also result in higher perceived complexity of the price structure as well as greater feelings of being manipulated by marketers. However, Shirai (2012) showed that those negative perceptions could be reduced when TRP and retail price were presented together. Finally, Bambauer-Sachse and Grewal (2011) showed that TRP was found to be evaluated better when it was expressed in even price endings as opposed to odd endings, and when they were used with higher prices, for shorter periods of time, and among consumers with lower affinity for making mathematical calculations.

In sum, a void in the research is that previous studies have not examined the effects of TRP in an in-store context. Overall, we conclude that further research is warranted to investigate the effects of the three methods, measure-based UP, usage-based UP, and TRP, on consumer perceptions. As described

earlier, Shirai (2017) examined this issue in a context where a product was shown solely in an advertisement. This article targets an in-store decision-making context to understand their effectiveness more fully.

2.3. Hypotheses

Among the methods, measure-based UP is the most familiar for consumers since the use by grocers has a long history. Consumers should find it useful to identify lower priced products. Also, it is obtained from a simple calculation such as dividing a retail price by its product weight; hence, they are objective, unambiguous, and easy to understand. It is expected to generate relatively high consumers' evaluations.

On the other hand, usage-based UP and TRP contain some ambiguity as the process of defining their reframed prices is not very clear to consumers. Consumers are not certain about whether exactly the same scale is adopted to calculate each reframed price and how the scale is determined. However, we presume that consumers would generate better evaluations for usage-based UP than TRP because the former is more aligned with the thoughts that consumers generate during shopping or consumption. For example, consumers frequently think of the usage time of a product such as how many washing loads they will be able to do with a certain priced laundry detergent or how much the cost will be per washing load. Usage-based UP matches with these types of thoughts fairly. Because consumers do not find such calculations easy to do mentally, they are likely to express preference toward usage-based UP. As for TRP, consumers need to consider the possible or planned consumption period for a target product to use its reframed prices. Conducting this type of evaluation for several products requires time and effort so that consumers may not appreciate such information much. Accordingly, preference toward TRP is expected to be lower in this context.

We also expect that consumers' evaluations regarding their brand choice decision would be better if the evaluation of presented price-reframing is favorable because it means consumers preferred the given decision context. On the basis of these considerations, we set the following hypotheses.

H1. Consumer evaluations of reframed prices are higher when measure-based UP or usage-based UP is used compared to when TRP is used.

H2. Consumers' evaluations of their decision to select a brand are more favorable when measure-based UP or usage-based UP is used compared to when TRP is used.

3. Method

3.1. Design and Sample

An experiment was conducted to test hypotheses. For a product category, we selected tea leaves packed in tin boxes because retail prices of this category could be expressed in terms of the three methods. Also, participants had some knowledge of the product category and both males and females could be potential customers of the product category. We then created five brands identified as A to E, following Jr. Kwortnik *et al.* (2006). Details of these brands are shown in Table 1.

The experiment involved a one-factor, between-subjects design with four levels, categorized by price-reframing method. The levels were measure-based UP, usage-based UP, TRP, and a control. With the exception of the control condition, participants were shown a reframed price of the assigned method for each brand. For measure-based UP, the expression, "JPY__ per gram" was adopted (JPY is the abbreviation for the Japanese yen). For usage-based UP, we defined the usage rate as a cup of tea and used the expression, "JPY__ per cup." For TRP, we adopted a per day frame because the time required to consume a can of tea leaves is not very long and previous research found that a per day frame was favored over a per month frame (Gourville, 2003). The reframed price was calculated as though consumers had a cup of tea every day, and the expression, "JPY__ per day if you drink a cup of tea every day" was used.

The amount used to calculate per cup reframed price for each brand was set at around 2 g (see Table 1). This resembles an actual market situation. To be more specific, a single cup of tea typically uses about 2 g of tea leaves, but the amount of tea leaves contained in one teabag (equivalent to one cup) varies by brand in actual markets. This means that the brand with the lowest price per gram and the brand with the lowest price per cup do not necessarily match. In our study, Brand A had the lowest price per day and per cup; thus, it was the brand with the lowest reframed price of usage-based UP and TRP. Brand E had the lowest price per gram; in other words, it was the brand with the lowest reframed price of measure-based UP.

Table 1. Details of the five brands

	Brand A	Brand B	Brand C	Brand D	Brand E
Price (JPY)	1,035	885	915	955	975
Weight (gram)	180	120	130	150	180
Price per gram ^a	5.75	7.38	7.04	6.37	5.13
Price per cup ^b	10.1	13.3	14.1	12.7	10.8
Price per day ^c	10.1	13.3	14.1	12.7	10.8
Amount (grams) used to calculate price per cup	1.75	1.8	2.0	2.0	2.1

Note: The Japanese yen (JPY) presently converts to United States dollars at about \$1 = JPY100.

^a Price per gram is a reframed price of measure-based UP.

^b Price per cup is a reframed price of usage-based UP.

^c Price per day is a reframed price of TRP.

3.2. Procedures and Measures

One hundred and sixty-two undergraduate students participated in the experiment. Participants were randomly assigned to one of the four experimental conditions, and given the assigned paper-and-pencil booklet. A scenario approach was adopted in the questionnaire. Participants were first asked to imagine that they enjoyed drinking black tea at home and they were planning to purchase a new can of tea leaves. Then they imagined that they had noticed a tea specialty shop while window-shopping on a street, decided to enter the store, and saw a display for canned tea leaves while browsing through the shop. Next, a display of five brands were presented with information on retail price, weight, and the assigned reframed price (if any). They were asked to choose one brand to purchase. Finally, they responded to questions regarding the chosen brand and the decision they had made.

All items were measured on a seven-point rating scale. First, the evaluations regarding brand choice were measured with three items based on Jr. Cronin, Brady, and Hult (2000) and Fitzsimons (2000): satisfaction (“very dissatisfied/very satisfied,” “very bad/very good”), easiness (“very difficult/very easy”), and enjoyment (“very unenjoyable/very enjoyable,” “very uninterested/very interested”). Two responses of satisfaction and enjoyment were averaged to form an index respectively ($r = 0.81$, $p < .0001$ for satisfaction; $r = 0.75$, $p < .0001$ for enjoyment). Then, participants who were assigned to one of the three price reframing conditions responded to measures evaluating the observed reframed prices. For the scale, following Shirai (2017), five items were used: usability (“not very usable/very usable”), likability (“dislike very much/like very much”), comprehensibility (“very difficult to understand/very easy to understand”), attractiveness of retail price (“make the retail prices look very unattractive/make the retail prices look very attractive”), and inexpensiveness of retail price (“make retail prices look very expensive/make retail prices look very inexpensive”). Finally, the perceived price and perceived quality of the chosen brand were

measured using scales based on Bambauer-Sachse and Grewal (2011), and Bornemann and Homburg (2011). Two items were used for perceived price (“very expensive/very cheap,” “not at all attractive/extremely attractive”) and two for perceived quality (“very bad/very good,” “very unreliable/very reliable”). Responses were averaged to form perceived price and quality indexes ($r = 0.74$, $p < .0001$ for perceived price; $r = 0.83$, $p < .0001$ for perceived quality).

4. Results

4.1. Hypotheses Tests

The means of all measured variables are shown in Table 2. The first hypothesis, H1, predicted that consumers’ evaluations of reframed prices of the measure-based and usage-based UP forms would be higher than those of TRP. To test this hypothesis, an ANOVA was conducted for each of the five evaluations regarding reference prices. The results revealed a main effect of the price-reframing method for usability ($F(2, 159) = 7.08$, $p < .01$), likeability ($F(2, 159) = 6.83$, $p < .01$), comprehensibility ($F(2, 159) = 5.80$, $p < .01$), and attractiveness of retail price ($F(2, 159) = 8.75$, $p < .001$). Tukey tests indicated that measure-based and usage-based UPs had a higher score than TRP on usability, likeability, and comprehensibility. With regard to the attractiveness of retail price, usage-based UP had a higher score than measure-based UP and TRP. We conclude that these are consistent with H1.

Table 2. Means of evaluations

	Variable	Measure based UP	Usage based UP	TRP	Control
Evaluations of the reframed prices	Usability	6.53	6.78	6.00	–
	Likeability	5.83	6.20	5.17	–
	Comprehensibility	6.65	6.76	6.07	–
	Attractive of retail price	5.83	6.51	5.37	–
	Inexpensiveness of retail price	5.60	6.00	5.29	–
Evaluations of the decision	Satisfaction	5.65	5.30	4.99	5.04
	Easiness	5.05	4.22	4.30	4.35
	Enjoyment	3.98	4.26	4.11	4.04
Evaluations of the chosen brand	Perceived price	4.95	4.99	4.48	4.48
	Perceived quality	4.91	5.04	4.84	4.54

The second hypothesis, H2, predicted that consumers’ evaluations on the brand choice decision would be more favorable when the measure-based or usage-based UP forms were used compared to the TRP form. To test this hypothesis, an ANOVA was conducted for the three decision-related evaluations. Regarding the satisfaction, measure-based UP had a higher score than TRP and the control condition ($F(3, 158) = 3.75$, $p < .05$). The analysis for easiness revealed that measure-based UP had a higher score than usage-based UP and TRP ($F(3, 158) = 2.24$, $p < .1$). No significant main effect was observed for decision enjoyment. We conclude that H2 is partially supported.

4.2. Selection of the Brand with the Lowest Reframed Price

Additional analyses were performed to investigate factors influencing the choice of the brand with the lowest reframed price. A logistic regression analysis was performed by comparing the control condition with the condition of each price-reframing method. The dependent variable was a dummy variable indicating whether the brand concerned was chosen. The independent variables were a dummy variable indicating whether the associated reframed price was presented, perceived price and quality of the chosen brand, and satisfaction, easiness, and enjoyment of the choice decision.

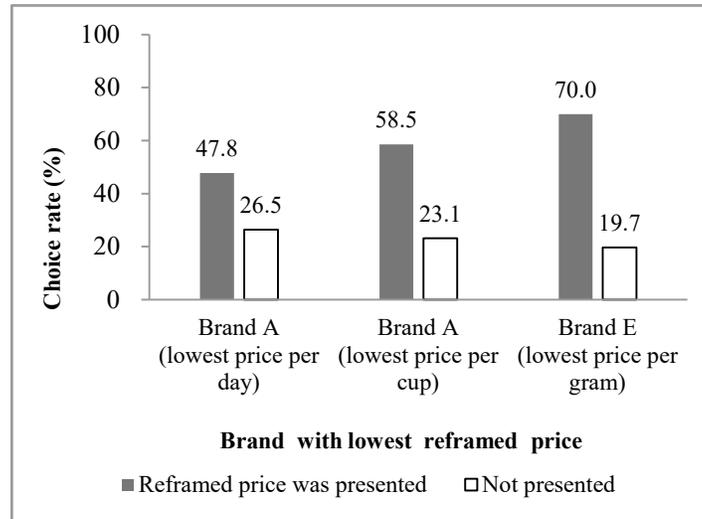


Figure 1. Choice as a function of reframed price information

The results for measure-based UP showed that the likelihood of choosing the brand with the lowest reframed price (Brand E) increased when its reframed price was presented ($p < .05$), perceived price was more positive ($p < .01$), easiness of the decision was greater ($p < .01$), and enjoyment of the decision was lower ($p < .05$). For usage-based UP, the likelihood of choosing the brand with the lowest reframed price (Brand A) increased when its reframed price was presented ($p < .01$), and perceived price and quality were more positive (price: $p < .05$; quality: $p < .01$). For TRP, the likelihood of choosing the brand with the lowest reframed price (Brand A) increased when its reframed price was presented ($p < .01$), perception of price and quality were more positive (price: $p < .05$; quality: $p < .001$), and satisfaction and easiness of the decision were lower (satisfaction: $p < .1$; easiness: $p < .05$). These results show that all methods generated a better price perception when the brand with the lowest reframed price was chosen. At the same time, TRP and usage-based UP were also capable of generating a higher quality perception for the brand, while measure-based UP was not. In addition, measure-based UP made participants feel that the decision was easy, but less enjoyable, whereas TRP made the participants feel the decision was not easy and less satisfying. These results imply that usage-based UP is the best method because no negative evaluations were evoked. Figure 1 shows choice rates of the brand with the lowest reframed price when the reframed prices were presented and absent. The figure indicates that the impact varies among the methods.

5. Discussion

Accumulating knowledge of how various methods of price reframing affect consumers' purchase decisions is of great importance to both researchers and retailers. Retail price is such an important determinant of the purchase decisions that finding a way to generate more favorable price perception from consumers is always a focus of attention, especially at the point of purchase decisions. Price reframing

may satisfy this demand because it reframes a retail price to a different amount by using a per unit calculation. However, there are multiple methods defined as price reframing, and previous research has paid little attention to comparing the effects of each method or elucidating differences among them. Thus, this article attempted to obtain initial empirical evidence on the topic by examining the impact of three methods: measure-based UP, usage-based UP, and TRP in an in-store decision context.

In this article, both measure-based UP and usage-based UPs are found to be appropriate in an in-store context. Also, measure-based UP is better at making the choice perceived easier whereas usage-based UP is better at increasing the attractiveness of retail prices. In addition, consumers who choose the brand with the lowest reframed price can perceive better price and quality on the brand when usage-based UP was used, but perceive only better price when measure-based UP was used. Hence, we conclude that usage-based UP is considered the most effective method.

This article extends theoretical knowledge in consumer research on price-reframing. Research on this topic has been scarce compared to the research on price promotions. The use of measure-based UP by grocers has a long history, but no research to date has considered the effects of other price-reframing methods comparatively. This article showed that usage-based UP can serve as a substitute for measure-based UP in an in-store context. Considering the results of Shirai (2017), we can conclude that measure-based UP is more effective in an in-store context whereas TRP is more effective in a stand-alone context. Another conclusion is that the effectiveness of usage-based UP is independent from these contexts as consumers generated positive evaluations in both contexts. This sheds light on how each price-reframing method affects consumers' evaluations and further extends knowledge on consumer responses toward the additional price information regarding time, amount, and usage amounts.

Our findings have a practical implication for retailers such that consumers may appreciate usage-based UP more than measure-based UP when shopping in a store. Measure-based UP requires consumers to compare prices among similar products so that they may feel reluctant to expend the time and effort to do so. Conversely, usage-based UP provides information based on consumption so that consumers can use it to evaluate a target product only. Also, consumers concerned about product costs per use may appreciate usage-based UP. In this situation, the UP may reduce consumers' price consciousness because their focus may shift to consumption rather than price. Also, along with usage-based UP, providing the usage count of the product may help consumers to make decisions easily. This information may enhance the value of usage-based UP. Jr. Kwortnik *et al.* (2006) showed an interactive effect of usage-based UP and usage count information on the accuracy of evaluations. In sum, retailers are encouraged to focus more on usage-based UP as it is considered the most desirable form of price-reframing.

Although this article extends our knowledge on key questions related to price reframing, further research is needed. First, a mixed application of the three price-reframing methods may be an interesting approach; that is, presenting different methods for different brand options may provide further understanding as to which method consumers actually prefer. Second, only the per day form was examined in our analysis of TRP; other time frames should be examined to build a more complete picture of TRP effects. Lastly, other product categories should be targeted to extend the implications of this article.

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