



INDIAN INSTITUTE OF MANAGEMENT
AHMEDABAD • INDIA

Weighted-Additive versus Reference-Dependent Models of Bundle Evaluation: Evidence from Discount Framing On Product Bundles with Surcharges

Arvind Sahay
Sumitava Mukherjee

W.P. No. 2014-03-12
March 2014

The main objective of the working paper series of the IIMA is to help faculty members, research staff and doctoral students to speedily share their research findings with professional colleagues and test their research findings at the pre-publication stage. IIMA is committed to maintain academic freedom. The opinion(s), view(s) and conclusion(s) expressed in the working paper are those of the authors and not that of IIMA.



INDIAN INSTITUTE OF MANAGEMENT
AHMEDABAD-380 015
INDIA

Weighted-Additive versus Reference-Dependent Models of Bundle Evaluation: Evidence from Discount Framing On Product Bundles with Surcharges

Arvind Sahay*

Sumitava Mukherjee[#]

Abstract

Attractiveness of product bundles largely depends on how prices are framed. There is considerable disagreement among two contemporary models that posit how product bundles with discounts are evaluated. According to the weighted-additive model, discounts on the most important component in a bundle increases attractiveness. However according to the reference-dependent model, discounts on the most negatively valued component make a bundle more attractive. This research evaluated the relative influences of different price formats and discount offers for bundles with a primary product and a secondary surcharge component (shipping charge). Across two studies on a low and a high priced product, discounts on the negatively valued shipping surcharge increased attractiveness of the bundle compared to a similar discount on the product, thus supporting the reference-dependent model. Further, for a low priced product, bundling increased attractiveness while for a high priced product, partitioning was more attractive. Beyond theoretical understandings of price evaluation, these findings also have important practical implications for advertisers.

Keywords: product bundle, partitioned pricing, price discount, framing, weighted-additive model, reference-dependent model

* Address correspondence to Dr. Arvind Sahay, Professor of Marketing and International Business, Indian Institute of Management, Ahmedabad -380015, India. Email: asahay@iimahd.ernet.in Phone: +91-79-6632-4896. Fax: +91-79-6630-6896.

[#] Sumitava Mukherjee (sumitava.inbox@gmail.com) is a research associate in Marketing, Indian Institute of Management, Ahmedabad -380015, India

Weighted-Additive versus Reference-Dependent models of bundle evaluation: Evidence from discount framing on product bundles with surcharges

Introduction

Growing markets open up newer customer segments and allow companies to offer a variety of price structures dynamically, but it also poses new challenges for marketing. In the expanding online sales market, for instance, product(s) need to be bundled with additional surcharges like shipping costs to account for the added service (delivery to the customer's address). Examples are common in other areas like online bookings on a travel website which offer the main service (booking a room) but have an additional surcharge (transaction charge). A significant body of marketing research has shown that beyond customer preferences, attractiveness depend on framing of price information (e.g., Janiszewski & Cunha, 2004; Johnson, Herrmann & Bauer, 1999; Morwitz, Greenleaf & Johnson, 1998; Yadav & Monroe, 1993; Yadav, 1994).

Customers are often presented prices in an 'all-inclusive' manner (bundled pricing) or prices of separate components are listed individually (partitioned pricing). Online retail companies can either present a bundled price of \$1050 that includes shipping charges or as a partitioned price of \$1000 for the product along with a shipping surcharge of another \$50. Further, for strategic advertising, discounts can be offered on the product or the surcharge or on the overall bundle.

Two models have been proposed to explain how consumers evaluate product bundles with discounts – the weighted-additive model (Yadav & Monroe, 1993) and the reference-dependent model (Janiszewski & Cunha, 2004), but discrepant evidences have been reported. Little research has looked at these models from the perspective of product bundles with surcharges. In this paper, the weighted-additive and the reference-dependent models are examined in light of different pricing frames for products bundled with a shipping surcharge. This would advance a more nuanced understanding of the theory and would also recommend practical implications for marketing professionals.

Price framing and theoretical models for product bundles

Different strategies can be explored in pricing a bundle. One can keep a low product price and add higher margins to surcharges or keep a high product price and offer discounts. The company can partition the prices and present the product and shipping surcharges separately or as a consolidated price. At times, customers underestimate the total costs by discounting surcharges and hence a partitioned pricing frame increases demand (Morwitz, et al., 1998). However, mental accounting (Thaler 1985) proposes that multiple losses are perceived as harsher than a single loss of equivalent financial value implying an all-inclusive price is probably viewed as more preferable compared to a partitioned one. Indeed, mentioning every bundle component's price individually increase the impact of the unfavorable monetary losses (Burman & Biswas, 2007; Johnson, et al., 1999; Yadav & Monroe 1993). This is more pronounced for customers who perceive companies are drawing a premium surcharges (Schindler, Morrin & Bechwati, 2005). Sheng, Bao & Pan (2007) showed that one of the boundary conditions that can consolidate some contradictory results of bundled and partitioned pricing is the relative significance of the surcharge to the base price. These authors found that when the surcharge is low compared to the base price, partitioned pricing increase attractiveness of the bundle and vice-versa, mediated by perceived fairness of the surcharge. Finally, price can play two important roles – an informational role related to quality (Rao & Monroe, 1988) and a sacrificing role related to the amount being spent (Erickson & Johansson, 1985). The bundled versus partitioned pricing strategy in product purchases with shipping surcharge influence the weight attached to different roles of price (Volckner, Ruhle & Spann, 2012). In general, types and presentations of surcharges are influential factors (Xia & Monroe, 2004).

For both bundled and partitioned prices, one can offer discounts on the primary component (product) or secondary surcharges (shipping). Where should one offer the discount – on the product price or the shipping surcharge or on the overall price? Large online retailers like Amazon and BestBuy.com often separate the product price from shipping charges and also offer promotional discounts on products or shipping. Hence, understanding how these different price frames are processed by customers are of importance to a range of industries and service providers. Previous research has generated a wealth of important insights but there remains some confusion and conflicting positions.

The predominant models for evaluation of discounted products in a bundle are the weighted-additive model (Yadav & Monroe 1993; Yadav 1994) and the reference-dependent model (Janiszewski & Cunha, 2004) but these models make different predictions. The weighted-additive model predicts that discounts on more important items are most influential while reference-dependent model predicts discounts on the most negatively valued item influences the overall evaluation. Some studies argue that simultaneously both are operating at the same time (Gaeth et. al. 1990).

The experiments conducted by Yadav (1994,1995) were based on the weighted-additive model. According to this model, the consumer decides the weights for each item (w_i) depending upon the importance of the item and eventually sums up the utility of each item with the weight ($w_i * u_i$) to arrive at an overall evaluation of the bundle ($\sum w_i u_i$). This model assumes that one of the components in the bundle will be naturally more important and would receive the highest weight during bundle evaluation (Yadav, 1994). Hence, the prediction from such a model is that the impact of price discount will be highest when it is offered on the most important item in the bundle.

An alternative model that explains price discount framing is the reference-dependent model (Janiszewski & Cunha, 2004). This model is based on prospect theory's value function (Tversky & Kahneman 1991) that is steeper for losses than it is for gains. As loss portion is steeper, if discount is offered on the lesser valued item, then the bundle would be valued more positively. Assigning a discount on the item which is evaluated negatively would reduce the pain of losses.

Applying these models on product bundles with surcharges, one can predict how decision processes might be operating. In a product bundle with shipping surcharges, the product presumably is the more important item and the shipping surcharge is a secondary expense¹ often perceived as an additional loss (Schindler, et al., 2005; Sheng et al., 2007). Hence, the weighted-additive model should predict that a discount offered on the primary item – the product would increase attractiveness of the bundle while the reference-dependent model should predict that a discount on the shipping charges would make the offer more favorable.

¹ Most consumers do not like shipping charges and can abort a transaction if free shipping is not offered.
http://money.cnn.com/2008/06/20/pf/delivery_charges/index.htm?section=money_pf

H1a: According to the weighted-additive model, bundles with a discount on the primary product will be perceived as more attractive

H1b: According to reference-dependent model, bundles with a discount on the shipping surcharge will be perceived as more attractive.

The major goal of this research was to examine which of these hypotheses are supported when prices are bundled or partitioned.

Previous research has shown that partitioning a surcharge draws attention to its price and attributes (Bertini & Wathieu, 2008). Hence, when the price of the product is low, the difference between the product and surcharge is less and hence the surcharge would draw attention. So, for a lower priced product, bundled pricing should be more attractive. However, when price of a product is high, the difference between the product and surcharge is relatively large, so the surcharge should draw less attention (for a related discussion, see Sheng et al., 2007 and Kim, 2006). Thus, for a higher priced product, partitioning should be a more attractive strategy.

It remains to be examined which predictions from the two decision models (weighted-additive or reference-dependent) are supported when prices are presented in different frames for low and high priced products. To generalize, two studies were conducted on a low (study 1) and high (study 2) priced product. Both bundled and partitioned price frames were presented with discounts offered on product, surcharge or the overall bundle.

Overview of the studies

The product in the first study (flipflop) was a lower priced product which had a list price of 478 INR and a shipping cost of 90 INR. In the second study, the product (backpack) had a higher list price of 2478 INR and a shipping cost of 90 INR. This enabled a comparison between different price frames when the difference between the primary item (product purchased) and the secondary item (shipping surcharge) is relatively small (study 1) or large (study 2). No brand information of the retail website was presented. Both the studies employed a full factorial design comprising of six between-subject conditions with price format (2: bundled versus partitioned) and discount framing (3: discount on overall price, discount on product, discount on shipping surcharge) as factors. In all conditions, a discount of INR 90 was offered but the frames were different. For all the conditions, a realistic website image was modeled closely to established

online retail websites (see appendix). The design was such that there is little resemblance to any of the commonly used websites by our participants. All participants were told that a popular online retail store (without any brand information) is planning to start its operations in their city and were interested to evaluate customer responsiveness.

Study 1

Method

From a large pool of participants, 220 graduate students from a large business school in India voluntarily participated in response to a request to complete a web survey. All participants were divided into six groups and sent a web link (see sample screen in appendix) showing a flipflop which had a low price (product price was five times the surcharge). Prices were either bundled or partitioned. Bundled prices stated the list price as 568 INR including shipping charges and partitioned prices stated the listed prices as 478 INR for product + 90 INR as shipping charges. Discounts (90 INR) were offered on the overall price, product price or the shipping surcharge (see table 1 for all cells in the experiment).

Table 1. Price frames presented to the six groups in study 1

	Overall discount	Product Discount	Shipping discount
Bundled (List price = 568 including shipping)	Total = 478 (90 INR off)	Total = 478 (90 INR off on product)	Total = 478 (90 INR off on shipping)
Partitioned (List price = 478 Shipping = 90 Total = 568)	Total = 478 (90 INR off)	Total = 478 (90 INR off on product)	Total = 478 (90 INR off on shipping)

All the six groups saw identical stimuli with different price frames. The main dependent variable was attractiveness of the offer (on a 7-point scale; 1 = not at all attractive, 7 = very attractive). To account for concerns with paying shipping charges (Schindler et al., 2005), they were asked to rate how much it bothers them to pay for shipping charges on a 7-point scale (1 = not at all; 7 = very much). Then they filled some demographic information (age, gender, family income and

whether they had used such a flipflop). Data was analyzed from only those who stated that they had used a flipflop before ($n = 206$; mean age = 23.25 with a range from 22 to 40; 72 females).

Results

A 2 (price format: bundled, partitioned) x 3 (discount framing: overall, product, shipping) ANOVA was performed on attractiveness of offer. Concern with shipping charges, age and income were entered as co-variates. There was no main effect of any covariate showing the success of random assignment. We found a main effect of price format, $F(1, 200) = 9.53$, $p = .002$, $\eta^2 = .04$ and a main effect of discount framing, $F(2, 200) = 4.30$, $p = .01$, $\eta^2 = .04$. There was no significant interaction between price format and discount framing ($p > .5$).

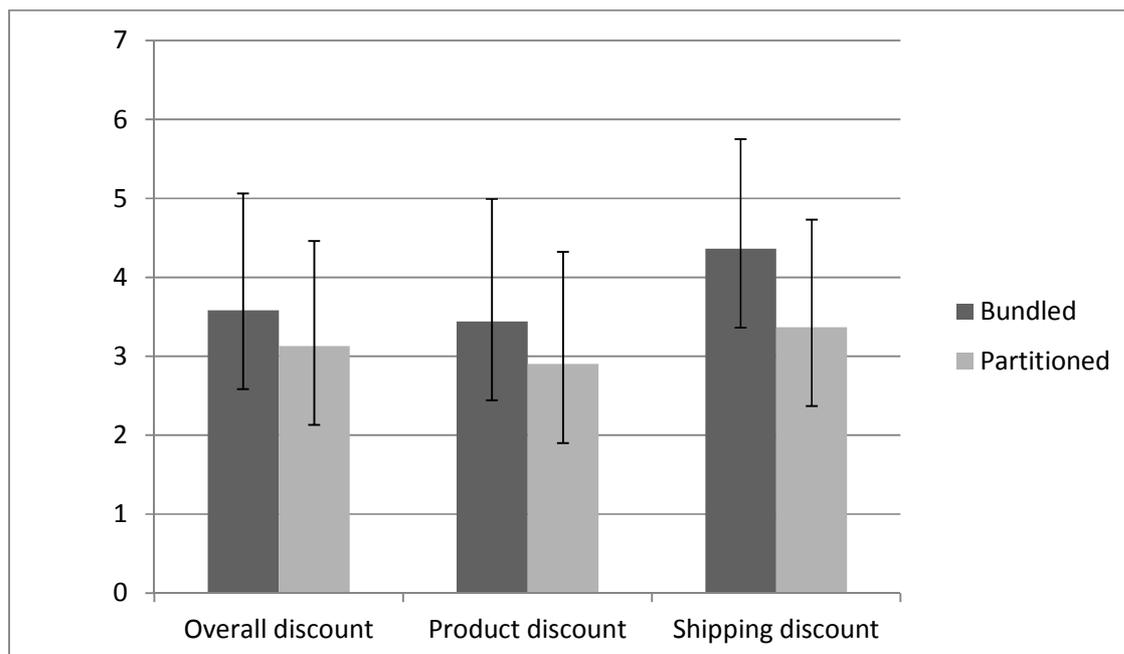


Figure 1. Mean attractiveness of the offers in study 1. Error bars show one standard deviation.

Planned post-hoc tests showed that attractiveness for bundled prices (mean = 3.78, SD = 1.52) were more attractive than partitioned ones (mean = 3.15, SD = 1.37), 95% CI [.22, 1.03], $p = .002$. Among the different discount frames, a discount offered on shipping was rated more attractively than a similar discount on the product (mean difference = .68, 95% CI [.09, 1.27]), p

= .01. The results supported the hypothesis (H1b) that shipping discounts are more attractive than a similar product discount, rendering support to the reference-dependent model. Moreover, as predicted, bundled price frames were more attractive than partitioned ones for a lower priced product.

Study 2

Method

Similar to the previous study, 180 graduate students from a large Indian business school participated voluntarily. Shipping surcharge was similar (90 INR) but the product (backpack) was priced significantly higher (2478 INR; 27 times the surcharge) compared to study 1. Bundled prices stated the list price as 2568 INR including shipping charges and partitioned prices stated the listed prices as 2478 INR + 90 INR shipping charges (see appendix). Again, participants were divided into six groups with prices being bundled or partitioned and discounts offered in four ways as in study 1. Participants were asked to rate attractiveness of the offer (on a 7-point scale; 1 = not at all attractive, 7 = very attractive). Concern with paying shipping prices and demographic information (age, gender, family income) were recorded. Data was analyzed from those who had used such a backpack ($n = 169$; mean age = 23.48 years with a range of 20 to 50; 72 females).

Results

A 2 (price format: bundled, partitioned) x 3 (discount framing: overall discount, product discount, shipping discount) ANOVA with concern with shipping charges, age and income as co-variates (no co-variates showed any significant effect), revealed an effect of price format, $F(1, 163) = 5.63, p = .01, \eta^2 = .03$ with partitioned prices being rated as more attractive (mean = 3.13, $SD = 1.36$) than bundled prices (mean = 2.67, $SD = 1.42$). There was a main effect of discount framing, $F(2, 163) = 3.45, p = .03, \eta^2 = .04$.

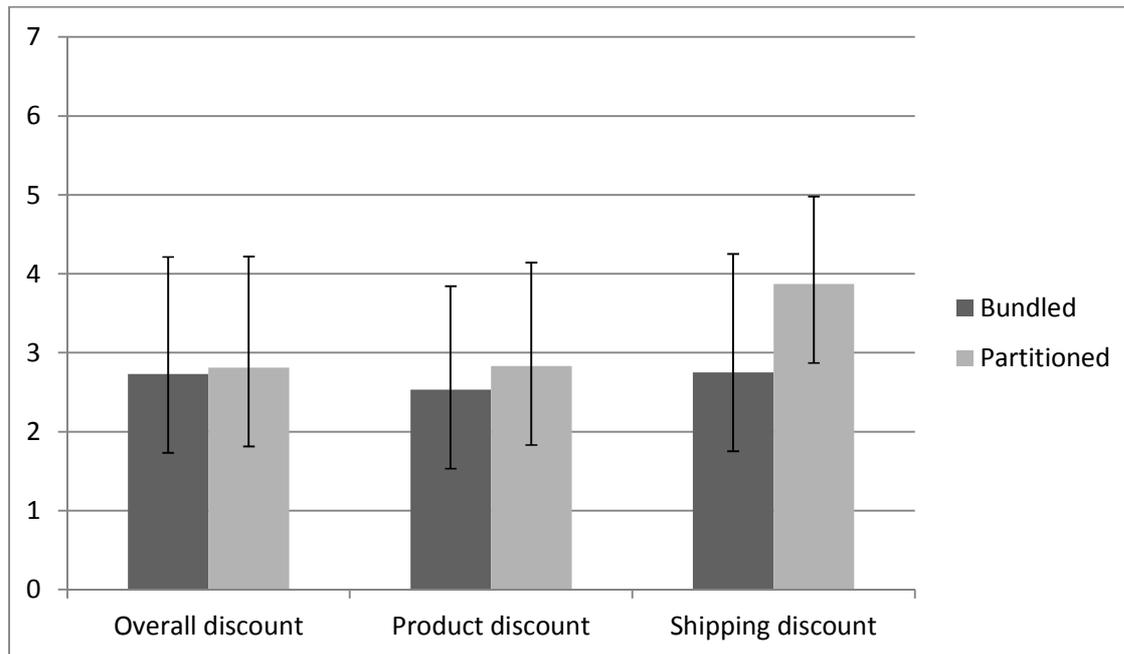


Figure 2. Attractiveness of offers in study 2. Error bars show one standard deviation.

Post-hoc tests showed that a discount offered on shipping (mean = 3.22, SD = 1.45) was more attractively rated than a similar product discount (mean = 2.69, SD = 1.31), mean difference = .66, 95% CI [.008, 1.31], $p = .04$. There was no interaction between price format and discount framing ($p > .12$). These results thus support the hypothesis (H1b) predicted by the reference-dependent model showing discounts on shipping surcharges are more attractive than discounts on products. Further, partitioned prices were more favorable than bundled prices as predicted for a higher priced product.

General Discussion

This research empirically tested the predictions in light of product bundles with surcharges and found evidence for the reference-dependent process model across both studies. Discounts offered on shipping charges increased attractiveness of the product bundles for both low and high priced products. These results are among the first to study bundles with surcharges in light of the weighted-additive and reference-dependent models.

Further, it was also found that when the price of the focal product is low (study 1), it would be more effective to bundle both the product and surcharge prices in a all-in-one price, which possibly would reduce the “pain of paying” multiple costs. When the price of the focal

product is reasonably high (study 2), it should be more attractive to partition the product and surcharge prices possibly because it might create a feeling of lower product prices compared to a bundled price as suggested by Morwitz et al. (1998). While some studies (e.g., Burman & Biswas, 2007) suggest bundling to be a more effective strategy, other research positions (e.g., Morwitz et al., 1998) suggest partitioning to be more effective. This research shows that both pricing strategies could be effective. One needs to select a strategy depending on what kind of product is being offered. Hence, the apparent discrepancy between bundling and partitioning strategies could be due to different prices of focal products used in previous research (also see Sheng et al., 2007).

There are practical implications that can be strategically used for advertising offers. It is important to weigh pricing strategies differently depending on which product is being offered and what is its price. Depending on the price of the focal product, either a bundled or partitioned strategy might make the discount offer more attractive. Overall, shipping discounts are more positively viewed and hence it would be profitable for online retail companies (like Amazon) to offer larger discounts on surcharges.

Multiple aspects warrant further research. Often there are a number of different surcharges that customers need to pay (see Volckner et al., 2012). It is not clear how customers would be processing a combination of surcharges and whether increasing the number of surcharges or amount of surcharges would affect the main findings. Secondly, the products used in our studies were deliberately kept as medium involvement products but whether the pattern would be similar for high (e.g., a laptop) versus low (e.g., printer cartridge) involvement products remain to be explored. It is also possible that brand information might influence the results. Further, here partitioning referred to products with surcharges (shipping) that were mandatory. Future research could explore whether the results translate to product bundles with non-mandatory components. Finally, individual motivational characteristics like regulatory focus can influence perception of price partitioned frames with promotion oriented buyers perceiving partitioned prices more favorably than prevention focused buyers (Lee, Choi & Li, 2014). More research in this direction can possibly find interesting patterns between situational or trait motivational variables and information processing mechanisms associated with processing of price frames.

In summary, this research makes a contribution to theoretical and practical aspects of bundling and partitioned pricing research. There was very little work on how different discounts on the overall bundle or product or surcharge at two different formats (partitioned versus bundled) is perceived by customers, especially from the perspective of contemporary psychological models. In common parlance, shipping surcharges need to be discounted to make it more appealing to customers as predicted by the reference-dependent model for bundle evaluation. However, an all pervasive marketing strategy might not give optimal results. Both bundling and partitioning pricing strategies are useful. The product being offered should decide a marketing strategy. More generally, price framing is an effective means for tailoring customer preferences and more research in this direction would add more both to theoretical and practical levels.

References

- Bertini, M., & Wathieu, L. (2008). Attention arousal through price partitioning. *Marketing Science*, 27(2), 236-246.
- Burman, B., & Biswas, A. (2007). Partitioned pricing: Can we always divide and prosper?. *Journal of Retailing*, 83(4), 423-436.
- Erickson, G. M., & Johansson, J. K. (1985). The role of price in multi-attribute product evaluations. *Journal of Consumer Research*, 12(2), 195-199.
- Gaeth, Gary, J., Levin, Irwin, P., Chakraborty, Goutam and Levin, Aron, M. (1990) "Consumer evaluation of multi-product bundles: an information integration analysis", *Marketing Letter*, 2 (1), 47-57.
- Janiszewski, C., & Cunha Jr, M. (2004). The influence of price discount framing on the evaluation of a product bundle. *Journal of Consumer Research*, 30(4), 534-546.
- Johnson, M. D., Herrmann, A., & Bauer, H. H. (1999). The effects of price bundling on consumer evaluations of product offerings. *International Journal of Research in Marketing*, 16(2), 129-142.
- Kim, H. M. (2006). The effect of salience on mental accounting: how integration versus segregation of payment influences purchase decisions. *Journal of Behavioral Decision Making*, 19(4), 381-391.
- Lee, K., Choi, J., & Li, Y. J. (2014, in press). Regulatory focus as a predictor of attitudes toward partitioned and combined pricing. *Journal of Consumer Psychology*.
- Morwitz, V., Greenleaf, E., & Johnson, E. J. (1998). Divide and prosper: consumers' reaction to partitioned prices. *Journal of Marketing Research*, 35(4), 453-463.
- Rao, A. R., & Monroe, K. B. (1988). The moderating effect of prior knowledge on cue utilization in product evaluations. *Journal of Consumer Research*, 15(2), 253-264.
- Schindler, R. M., Morrin, M., & Bechwati, N. N. (2005). Shipping charges and shipping-charge skepticism: Implications for direct marketers' pricing formats. *Journal of Interactive Marketing*, 19(1), 41-53.
- Sheng, S., Bao, Y., & Pan, Y. (2007). Partitioning or bundling? Perceived fairness of the surcharge makes a difference. *Psychology & Marketing*, 24(12), 1025-1041.

- Thaler, R. (1985). Mental accounting and consumer choice. *Marketing science*, 4(3), 199-214.
- Völckner, F., Rühle, A., & Spann, M. (2012). To divide or not to divide? The impact of partitioned pricing on the informational and sacrifice effects of price. *Marketing Letters*, 23(3), 719-730.
- Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics*, 106(4), 1039-1061.
- Xia, L., & Monroe, K. B. (2004). Price partitioning on the internet. *Journal of Interactive Marketing*, 18(4), 63-73.
- Yadav, M. S., & Monroe, K. B. (1993). How buyers perceive savings in a bundle price: An examination of a bundle's transaction value. *Journal of Marketing Research*, 30(3), 350-358.
- Yadav, M. S. (1994). How buyers evaluate product bundles: A model of anchoring and adjustment. *Journal of Consumer Research*, 21(2), 342-353.

Appendix: Sample stimuli used

The screenshot shows a product page for flip-flops. The navigation bar includes 'Great Selection', 'Low Prices', 'Fast Delivery', 'What's New', 'Gift Certificate', 'Wishlist', and a 'Like' button with '1.2m' followers. The breadcrumb trail is 'Home > Shoes > Slippers > Flip-Flop'. The product description states: 'Chill out in these slippers The bluepair features a simplistic V-shaped upper. The footwear sports a bright and colourful footbed to keep you active and energetic.' The main image shows a blue flip-flop with a colorful pattern. To the right, the pricing is displayed as: 'List price: ~~Rs. 568~~', 'Including shipping charges' (with a sub-note 'Includes all taxes'), and 'Total Rs. 478' with 'Rs. 90 off on shipping'. Below this, it says 'In Stock', 'Delivered in 5-7 Business Days. (?)', and 'Quantity: 1'. A 'Buy Now' button is present. At the bottom, it says 'Hassle Free return in 10 days'. On the left, there are three service boxes: 'EMI Payment Options' (HDFC, Citi, Axis, ICICI...), 'No Anxiety Shipping' (9,000+ Locations, Know More), and 'Buyer Protection' (Know More). Social media icons for WhatsApp, Facebook, and Twitter are also visible.

Figure S1: Bundled pricing with shipping discount used in study 1

The screenshot shows the same product page as Figure S1, but with partitioned pricing. The navigation bar and breadcrumb trail are identical. The product description is the same. The main image of the flip-flop is also the same. To the right, the pricing is displayed as: 'List price: Rs. 478', 'Selling price: Rs. 478' (with a sub-note 'Includes all taxes'), and 'Shipping charges: ~~Rs. 90~~'. Below this, it says 'Total ~~Rs. 568~~ Rs. 478' with 'Rs. 90 off on shipping'. The 'In Stock' status, delivery time, and quantity are the same. The 'Buy Now' button and 'Hassle Free return in 10 days' text are also present. The service boxes and social media icons on the left are identical to Figure S1.

Figure S2: Partitioned pricing with shipping discount used in study 1

Great Selection Low Prices Fast Delivery What's New Gift Certificate Wishlist Like 1.2m

Home > Computers > Laptop Bags, Cases & Covers > Backpack >

DESCRIPTION

A multi utility backpack designed for the urban outdoor requirements, Club is an ideal companion with copious space, integrated haul loop, study shoulder straps, ergonomic mesh padded back system & an evolved organization.

Payment Options
EMI (HDFC, Citi, Axis, ICICI...)

No Anxiety Shipping
9,000+ Locations [Know More](#)

Buyer Protection
[Know More](#)



List price: ~~Rs. 2568~~
Including shipping charges
Includes all taxes

Total Rs. 2478
Rs. 90 off on shipping

In Stock
Delivered in 5-7 Business Days. (?)

Quantity:

Buy Now

Hassle Free return in 10 days

Figure S3: Bundled pricing with shipping discount used in study 2

Great Selection Low Prices Fast Delivery What's New Gift Certificate Wishlist Like 1.2m

Home > Computers > Laptop Bags, Cases & Covers > Backpack >

DESCRIPTION

A multi utility backpack designed for the urban outdoor requirements, Club is an ideal companion with copious space, integrated haul loop, study shoulder straps, ergonomic mesh padded back system & an evolved organization.

Payment Options
EMI (HDFC, Citi, Axis, ICICI...)

No Anxiety Shipping
9,000+ Locations [Know More](#)

Buyer Protection
[Know More](#)



List price Rs. 2478
Selling price Rs. 2478
Includes all taxes

~~Shipping charges Rs. 90~~

Total ~~Rs. 2568~~ Rs. 2478
Rs. 90 off on shipping

In Stock
Delivered in 5-7 Business Days. (?)

Quantity:

Buy Now

Hassle Free return in 10 days

Figure S4: Partitioned pricing with shipping discount used in study 2