

Marketing Decisions with Reference Price Effect

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INTRODUCTION

When people make decisions, they often compare the options in a choice set with existing reference levels, which are also known as reference points. According to a psychological analysis of value (e.g., Helson, 1964; Kahneman & Tversky, 1979; Mussweiler, 2003), reference points play a crucial role in human judgment and decision making (Tversky & Kahneman, 1991). Consumers' perceptions of attribute values and product preferences depend on reference points they use, rather than on absolute values alone, and changing reference points usually leads to reversals of preference (e.g., Kahneman & Tversky, 1979; Winer, 1986; Nowlis & Simonson, 1997; Chen & Rao, 2002).

Forexample, when a consumer decides whether or not to buy a product, he is likely to spontaneously retrieve the prices of this product encountered previously and then to form a reference price in his mind. If the current price is lower than his reference price, he will sense a gain and is more likely to buy it. On the contrary, if the current price is higher, a consumer's purchase intention will decrease. The reference price's impact on the consumer's purchase intention is called the reference price effect.

While the reference price point plays an important role in a consumer's buying decision which finally affects the sales of a product, a firm can form a higher reference price in the minds of consumers via various marketing mixes, among which advertising and pricing are the most important ones. Generally, advertising that aims at building up brand awareness can form a higher reference price whereas a price discount leads to a lower one. How to balance such conflict should be seriously considered when a market manager makes his market strategy. However, previous literature seldom takes such conflict into account, though there is much research concerning advertising or pricing decisions.

In this chapter, we introduce a joint advertising and pricing decision model considering the reference price effect, trying to propose an analytical framework to balance the above conflict. In detail, we consider a supply chain system consisting of a manufacturer and a retailer, in which the retailer purchases products from the manufacturer at a wholesale price w and then sells them to consumers at a retail price p . To build up its brand awareness, the manufacturer also invests in advertising. We assume that the brand advertising and the retail price will affect the reference price and formulate this into a differential equation to

catch the carry-over effect of these two market mixes. The manufacturer's decisions include the wholesale price w and its brand advertising effort u , and the retailer's decision is the retail price p . Since the two factors that affect the reference price, i.e., the brand advertising effort and the retail price are decided by the two channel members, our research question is how they cooperatively make these decisions.

The innovations of this chapter include the following. First, it investigates the manufacturer and retailer's conflict from the perspective of reference price. Second, it incorporates the advertising and pricing decisions simultaneously. Third, we propose a research framework to analyze the impact of reference price effect on a firm's decisions in a supply chain framework.

BACKGROUND

Reference price is defined as a standard against which the purchase price of a product is judged (Kalyanaram & Winer, 1995). The effects of reference price on consumer choice have long been recognized, and a large number of researchers from marketing and operations management have devoted themselves to this topic for decades. There is still, however, much worth studying. Studies exploring reference price effect can be found in both experimental and analytical modeling literature.

In the experimental literature stream, researchers have empirically investigated the impacts of reference price on consumer choice (Kalyanaram & Winer, 1995). They argue that consumers are sensitive to some information including past prices, competitor prices, cost of products offered, advertisement, and quantity. Based on such information, they will form reference prices and further to form fairness perceptions, which can affect their purchase decisions (Kahneman, Knetsch, & Thaler, 1986; Lichtenstein & Bearden, 1989; Rajendran & Tellis, 1994; Mazumdar & Papatla, 2000; Bolton, Warlop, & Alba, 2003; Rajendran, 2009). In marketing, reference price matters be-

cause of asymmetric price response that for a gain and loss of the same size, consumers' response to loss is greater than that to gain (Baucells, Weber, & Welfens, 2011), which has been supported by previous studies. For example, employing the IRI coffee data set, Lattin & Bucklin (1989) model and estimate the reference price effect, and their results suggest a loss aversion effect in brand choice decisions that consumers are more sensitive to price increases than to price decreases. Similar results can be also found in other empirical studies (e.g., Lattin & Bucklin, 1989; Kalyanaram & Little, 1989; Tversky & Kahneman, 1991; Pulter, 1992; Hardie, Johnson, & Fader, 1993; Kalyanaram & Winer, 1995; Meyer & Johnson, 1995; Bell & Lattin, 2000). This property gives rise to important substantive and practical implications for managers executing marketing activities such as price promotions.

Noting that the impacts of reference price on consumers' behaviors can in turn affect demand and the firms' profits, researchers have begun to pay attention to its impacts on marketing decisions. Empirical work conducted by Klapper, Ebling, and Temme (2005) indicates that quality consciousness can strongly affect loss aversion, so manufacturers should enhance consumers' expectations for quality to avoid intense price competition. Using a cross-sectional experiment, Lowe and Alpert (2010) argue that whether the pioneer brand is following a skimming or a penetration strategy, the initial price of the pioneer brand defines consumers' initial reference price. More recently, Kopalle, Kannan, Boldt, and Arora (2012) focus on studying the impact of household heterogeneity in reference price effect and brand preference on a retailer's pricing policy.

Analytical modeling research on reference price mainly focuses on pricing strategies. Incorporating the impact of past prices on demand, Fibich, Gavious, and Lowengart (2003) use the open-loop and closed-loop equilibrium methods to obtain explicit solutions to optimization pricing problems under a simple linear demand model with linear reference effects. They find that the

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