Economics Letters 36 (1991) 5–8
North-Holland

Who benefits from large rebates: manufacturer, retailer or consumer?

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Received 13 November 1990
Accepted 7 January 1991

Previous research has shown that price discrimination motivates manufacturers to offer coupons and rebates when their products are sold directly to consumers. This paper shows that manufacturer rebates can be profitable even if price discrimination does not occur, when the product is sold through a channel of distribution.

1. Introduction

Hundreds of billions of manufacturers' rebates and coupons are issued each year. According to the Manufacturers Coupon Control Center, consumers redeemed coupons valued at $2.93 billion in 1988. Cents-off coupons may allow sellers to achieve higher profits through price discrimination because consumers with high redemption costs do not use them and thus pay more [Levedahl (1984), Narasimhan (1984), Gerstner and Holthausen (1986) and Tirole (1989, p. 152)].

While price discrimination is a reasonable explanation for cents-off coupons, for dollars-off rebates such as those given by manufacturers of household appliances, it is not. Most consumers are likely to redeem these large rebates. This paper shows that within a channel of distribution, a manufacturer may find it profitable to offer rebates even when *all* customers use them. The retailer and consumers prefer sales motivated by wholesale price reductions.

2. The model

Consider a channel of distribution with a monopolist manufacturer who sells a product exclusively through a single, independent retailer to two consumer segments (a conventional exclusive channel): One segment consists of customers willing to pay a high price and the other consists of customers willing to pay only a low price. The two segments will be referred to as Highs and Lows, respectively. The manufacturer products a homogeneous product with a constant unit cost, assumed for simplicity to be zero. Costs of manufacturing, retailing, and processing rebates are all irrelevant for the arguments made below, so they are assumed for simplicity to be zero. Let P_w denote the wholesale price and P_r the retail price.

The Highs place a reservation price, V_H, on the product, and Lows have a reservation price V_L, where $0 < V_L < V_H$. Let α be the fraction of the population that are Highs. We suppose that

historically the manufacturer sold only to the Highs, but recently there has been an increase in the number of Lows, or their willingness to pay, sufficiently large so that the manufacturer can earn higher profit from retail sales to all consumers. The manufacturer must motivate the retailer to sell to the Lows by discounting the wholesale price (pushing the product) or by offering a rebate directly to consumers (pulling the product). Let D and R denote the values of the trade discount and rebate respectively.

Rebates are offered to all consumers, and each consumer self selects whether or not to redeem it depending on his redemption costs (time and effort involved in processing the rebates). The redemption costs of the Highs and Lows are denoted by T_H and T_L respectively.

The retailer takes the wholesale price and rebate as given when deciding on the retail price. He is said to participate in the manufacturer's price promotion if the retail price leads all the customers in the market to buy the product Participation under push is achieved if the retail price is no more than V_L, and under pull if the retail price less the rebate is no more than the Low's reservation price net of redemption cost, $V_L - T_L$. The retailer opposes the price promotion if the retail price is set so high as to eliminate the Lows. Acting as a channel leader, the manufacturer takes the retailer's reaction into account when deciding on an optimal price promotion policy. Channel profits under push and pull are derived next.

3. Trade discounts

Pure push promotions (push for short) involve wholesale price reductions called trade discounts; rebates are not offered. If the retailer opposes the promotion, he charges the reservation price of the Highs, V_H, and the Lows do not buy the product. In this case the manufacturer's profit-maximizing wholesale price is $P_W = V_H$, and the retailer earns zero profits. Call V_H the 'regular price'.

To motivate the retailer to sell to both segments, the trade discount must induce a retail price no higher than V_L, otherwise Lows will not buy the product. The intensity of push will be measured by the trade discount, $V_H - P_w$. What is the smallest trade discount that motivate a retail 'sale price' of V_L?

For a given wholesale price, the retailer's profit from selling only to Highs at the regular price is $\alpha(V_H - P_w)$. The profit from selling to all customers is $V_L - P_w$. The wholesale price will be adjusted until these two expressions are equal. Solving for the trade discount gives:

$$D^* = V_H - P_w(\text{push}) = (V_H - V_L)/(1 - \alpha). \tag{1}$$

The trade discount motivates the retailer to hold a sale, and the resulting optimal profits of manufacturer and retailer are

$$\pi_m(\text{push}) = P_w(\text{push}) = [V_L - \alpha V_H]/(1 - \alpha), \tag{2}$$

and

$$\pi_r(\text{push}) = V_L - P_w(\text{push}) = \alpha(V_H - V_L)/(1 - \alpha). \tag{3}$$

Total channel profits is V_L. The manufacturer prefers a push price promotion to leaving the wholesale price at the regular price when

$$V_L \geq \alpha V_H(2 - \alpha). \tag{4}$$

4. Rebates

Pure pull price promotions (pull for short) involve manufacturer rebates but no trade discounts. Trade discounts can irritate retailers who hold large inventories bought at the regular price. A rebate direct to the consumer is a way to avoid this channel conflict, but it has another advantage, as we will show next.

Under pull the wholesale price, $P_w(\text{pull})$, remains V_H, and consumers will redeem the rebate if its value exceeds their redemption costs. A rebate of R is said to be 'large' if all consumers redeem it; the Highs obtain a surplus of $V_H - T_H - (P_r - R)$, Lows, $V_L - T_L - (P_r - R)$, and price discrimination does not occur. Can large rebates be profitable for the manufacturer?

If the retailer opposes this promotion, he maximizes profits by raising the retail price until Highs obtain no surplus. Recalling that wholesale price equals the regular price, V_H, the retailer's price under opposition is $V_H - T_H + R$, and this profit equals $\alpha(R - T_H)$. Under participation the retailer sells to all consumers and maximizes profit by setting the retail price to extract the Lows' surplus. The retailer's price under participation is $V_L - T_L + R$, and his profit equals $V_L - T_L + R - V_H$. To induce retail participation, the manufacturer adjusts the rebate until these two profit expressions are equal:

$$R^* = \left[(V_H - V_L) - (\alpha T_H - T_L)\right]/(1-\alpha) = D^* - (\alpha T_H - T_L)/(1-\alpha). \tag{5}$$

The corresponding retail price and optimal profits of the manufacturer and retailer under pull are

$$P_r(\text{pull}) = V_L - T_L + R^* = \left[(V_H - \alpha T_H) - \alpha(V_L - T_L)\right]/(1-\alpha), \tag{6}$$

$$\pi_m(\text{pull}) = V_H - R^* = \pi_m(\text{push}) + (\alpha T_H - T_L)/(1-\alpha), \tag{7}$$

and

$$\pi_r(\text{pull}) = V_L - T_L + R^* - V_H = \pi_r(\text{push}) + \alpha(T_L - T_H)/(1-\alpha). \tag{8}$$

Total channel profits equal the Low's willingness to pay net of redemption costs, $V_L - T_L$. The following condition guarantees that the retailer obtains positive profit, Highs obtain positive surplus, and the retail price is above the regular price V_H:

$$V_H - T_H > V_L - T_L. \tag{9}$$

5. Who benefits from large rebates?

Can large rebates be more profitable for the manufacturer than trade discounts? What about the retailer, consumer, and total channel? Do they also prefer large rebates?

Result. In a conventional exclusive channel of distribution, the manufacturer may offer large rebates even when price discrimination does not occur, yet the retailer, consumers, and the entire channel prefer trade discounts.

The manufacturer's profits under pull exceed his profits under push if

$$\alpha T_H > T_L, \tag{10}$$

[see eq. (7)]. The explanation is as follows.

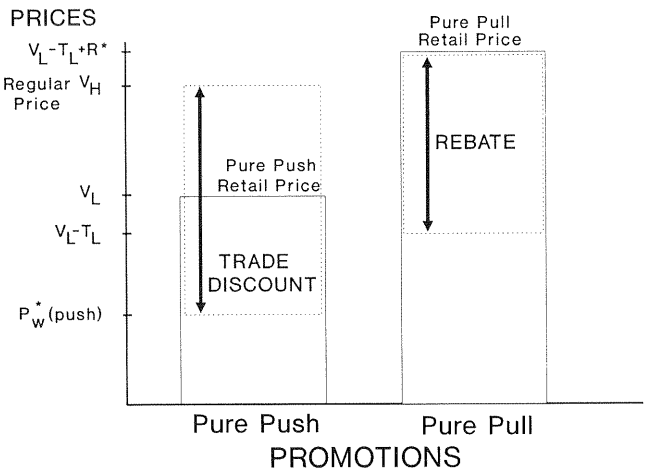

Fig. 1

Since $V_H > V_L$, the manufacturer offers large rebates only when there is a strong positive association between willingness to pay and redemption costs. These rebates impose larger redemption costs on the high reservation value consumers, so the gap between the two segments' willingness to pay is reduced. Therefore, it is less costly for the manufacturer to motivate the retailer to participate in a price promotion with rebates. The retailer prefers push to pull; he has a more viable threat to oppose the push promotion, so the trade discount exceeds the rebate [see eq. (5) and fig. 1].

With either price promotion total channel profits are channel profits are dictated by the willingness to pay of the Lows. Total profits are lower with rebates because the willingness to pay of the Lows is reduced by their redemption cost.

The Lows obtain zero consumer surplus under either push or pull, but the Highs prefer push. Under push the retail price is V_L, so the Highs obtain a surplus of $V_H - V_L$. Under pull the after-rebate price is $V_L - T_L$ so the Highs obtain a lower surplus, $V_H - T_H - (V_L - T_L)$, because condition (10) implies $T_H > T_L$. Intuitively, consumers prefer push to pull because in addition to rebate redemption costs, the independent retailer counteracts the manufacturer's rebate by substantially raising his price (see fig. 1).

In summary, we have shown that large manufacturer rebates may exist even in circumstances when all customers use them. Large rebates motivate an exclusive independent retailer to participate in a price promotion at a lower profit level compared to trade discounts, so the manufacturer prefers rebates while the retailer prefers trade discounts. Consumers are worse off with rebates because they pay a higher price and incur redemption costs.

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