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The benefits of consumer rebates: A strategy for gray market deterrence

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ABSTRACT

This paper analyzes a model where a manufacturer sells a product in two markets. One market is directly served by the manufacturer and the other is served by a retailer. While the manufacturer can offer consumer rebates, the retailer can potentially sell in a gray market, i.e., selling products outside of the authorized channel. Using a game-theoretic approach, we find that (1) rebates have a gray-market-deterrence effect, (2) rebates are beneficial to the manufacturer and possibly to retailer, (3) partial redemption of rebates is not always beneficial to the manufacturer, and (4) rebate leakage across markets or rebate under-valuation by consumers is not always detrimental to the retailer. These findings suggest the possible use of rebates even in scenarios where the conventional rationales for their use are absent.

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1. Introduction

Rebates are widely employed as a promotional tool. There are two kinds of rebates issued by the manufacturer in a supply chain: retailer rebates and consumer rebates. Retailer rebates are payments from the manufacturer to the retailer based on the retailer's sales performance. Consumer rebates, on the contrary, go directly to the consumers for each unit they purchase (Arcelus, Kumar, & Srinivasan, 2012; Aydin, Porteus, Agrawal, & Smith, 2009; Demirag, Keskinocak, & Swann, 2011). This paper focuses on consumer rebates. It is reported that nearly 30 percent of all consumer products and more than 20 percent of electronics are sold with rebate offers (Grow, 2005), 21 percent of shoppers use rebates every time they shop at a supermarket (Cho, McCardle, & Christopher, 2009), and the total U.S. redeemed rebates accounted for $3.7 billion in 2012 (NCH Marketing Services, 2013). Consumer rebates may take various forms such as peel-off coupons, free-standing inserts, mail-in rebates, to name a few. Some of them offer immediate value promotions while others provide delayed promotions (Chen, Li, Rhee, & Simchi-Levi, 2007).

Why are manufacturers likely to bypass retailers to issue consumer rebates? Previous research in marketing and operations attributes it to the following reasons. First, rebates provide a means of price discrimination (Chen, Moorthy, & Zhang, 2005; Gerstner, Hess, & Holthausen, 1994; Narasimhan, 1984). It works when a proportion of customers ends up not claiming the rebates, pos-sibly because they forget or just feel it is too much of a hassle. For this reason, the customers who redeem the rebate pay less for the product than those who do not. Second, rebates induce current sales (Gerstner & Hess, 1991; Lu & Moorthy, 2007; Nevo & Wolfram, 2002). As rebate companies are accustomed to designing complex rules, having a window of eligibility, and asking for the collection of proofs-of-purchase, consumers often spend time and energy in submitting the claim for a rebate. This is redemption cost. Consumers are heterogenous with respect to their redemption costs, and those who incur lower redemption costs are more likely to participate in promotions. Third, rebates help the manufacturer manage inventories when a supply chain survives in multiple periods (Arya & Mittendorf, 2013; Ault, Beard, Laband, & Saba, 2000). Under this circumstance, a forward-looking retailer tends to ration its orderings across periods so as to leverage a low transfer price from the manufacturer. This motive will be restrained if the manufacturer offers consumer rebates to subsidize early demand. By this token, rebates not only encourage customers to buy but also entice the retailer to sell.

This paper provides an exception case where conventional rationales for the use of consumer rebates are absent. We assume that all consumers redeem the rebates, redemptions do not incur any cost, and the manufacturer sells in one single period; hence there is no price discrimination, sales promotion, or orderings rationing. Under these assumptions, we still find that consumer rebates can be beneficial. In particular, we find that the manufacturer can use rebate strategy to fight against gray market (or called parallel import), which refers to products that are sold through unofficial or unauthorized distribution channels.

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To illustrate, we develop a simple model where a manufacturer sells a product in two markets. One market is directly served by the manufacturer (direct market) and the other is served a privately-owned retailer who contracts with the manufacturer on a wholesale price basis (indirect market). The retailer is permitted to sell goods only in its authorized market, but it may privately enter into the unauthorized market. Examples of the cross-market sales are ubiquitous. In 2007, 1.4 million iPhones were sold overseas via unofficial distribution networks (New York Times, 2008). In the pharmaceutical industry, 20 percent of the products sold in UK are parallel imports (Ahmadi, Iravani, & Mamani, 2015). Costco has had lawsuits from Calvin Klein, Omega, and Yves Saint Laurent brought against it for product diversion (Bryant, 2015).

Using a game-theoretic approach, we find that if there is no product flow across markets, the manufacturer has no reason to launch a rebate program. Interestingly, if the retailer finds it profitable to purchase goods in the indirect market and then privately resell them in the direct market, the manufacturer will distribute rebates in the indirect market. By doing so, the manufacturer can successfully prevent the retailer away from parallel importations. The rationale is that consumer rebates leverage for an increase in wholesale price and consequently in retail price. Once the (retail) price gap between different markets is filled-up, the retailer will no longer find it profitable to enter the unauthorized market.

Furthermore, we also find that rebates are not only beneficial to the manufacturer but may also make the retailer better off. This is because the establishment of gray market may be a prisoner's dilemma: The retailer, as well as the manufacturer, would be better off if the retailer could commit not to privately divert products. In light of this view, consumer rebates may achieve a Pareto improvement along the supply chain.

The findings above apply in many other extensions of the model, for example, when each market contains one single retailer, when the actual redemption rate is not 100 percent, when there exists rebate leakage across markets, and when consumers value the rebate less than its face value.

The literature on gray market claims that unauthorized product flows can exert negative or positive impacts on manufacturers. On one hand, gray market is harmful because (a) unlicensed products compete with those licensed, (b) brand value erodes as products become available everywhere, and (c) manufacturers have to make more efforts such as product improvement and advertisement to promote sales (Chen, 2009; Iravani, Dasu, & Ahmadi, 2013). On the other hand, gray market may also be beneficial because (a) a new stream of demand that is originally missed due to high prices becomes available (Ahmadi & Yang, 2000; Xiao, Palekar, & Liu, 2011), (b) retailers who divert to gray market carry more inventories and order more from manufacturers (Raff & Schmitt, 2007; Shulman, 2013), and (c) manufacturers get chances for arbitrage and price discrimination (Dasu, Ahmadi, & Carr, 2012; Yeung & Mok, 2013).

Researchers also suggest a variety of approaches to counteract these nocuous gray markets. For instance, manufacturers are able to raise the wholesale price at the expense of vertical pricing efficiency (Chen & Maskus, 2005; Maskus & Chen, 2002; 2004), offer a uniform pricing scheme among different markets (Antia, Bergen, & Dutta, 2004; Antia, Bergen, Dutta, & Fisher, 2006), adopt strategic prices and quantities (Ahmadi et al., 2015), invest in sales effort or delegate sales effort to retailers (Iravani et al., 2013), and design sophisticated contracts with retailers (Hu, Pavlin, & Shi, 2013; Su & Mukhopadhyay, 2012).

The current paper contributes to this stream of literature in that we present one more feasible measure that can be used to block gray market. Although consumer rebates have been widely practiced, they are typically considered within a single-market perspective. This paper claims that manufacturer-to-consumer rebates can also be deployed for multi-market settings. Besides, pervious research does not suggest ways to manage profitable gray market. This paper shows that even when gray market is beneficial, the manufacturer can still launch rebate programs to earn more profits.

The remainder of this paper is organized as follows. Section 2 establishes the base model. Section 3 analyzes the base model and outlines the benefits of consumer rebates. Section 4 extends the base model toward several directions, including the indirect-indirect market structure, partial redemption of rebates, rebate leakage across markets, rebate under-valuation by consumers, and positive promotion and diversion costs. This section demonstrates the robustness of the results and presents other implications of rebates. Section 5 concludes this paper. All proofs are collected in the Appendix.

2. Model setup

Consider a manufacturer who sells a single product in two separate markets denoted as L and H, respectively. We say the two markets are "separate" because consumers in one market cannot buy goods from the other, for example, when L and H refer to two countries. Consumers in L (the low market) are heterogeneous in their valuation for the product, denoted by V_L, which is distributed uniformly over the interval $[0, v_l]$. Consumers in H (the high market) value the product more. Their willingness to pay for the product, denoted by V_H, is distributed uniformly over the interval $[0, v_h]$, where $v_h > v_l > 0$. The mass of consumers in each market is normalized to 1, and therefore, consumer densities of markets L and H are $\frac{1}{v_l}$ and $\frac{1}{v_h}$, respectively.[1]

We begin the analysis with a base model in which the manufacturer sells goods directly to consumers in H and delegates the sales responsibility to a single retailer in L. This "direct-indirect" market structure is the simplest framework that can show the benefits of rebates.[2] Since consumers in H have a higher willingness to pay than those in L, the retailer may find it profitable to purchase goods from the manufacturer and then resell them to H rather than to L. The private action of the retailer will generate a gray market, denoted as market G, which is not intended by the manufacturer. Products in G are the same as those in H, but consumers value them less, simply because they are bootlegs, do not have warranty, or might involve additional costs. For instance, in China's iPhone-gray-market, to unlock the phone and add Chinese language software costs an additional \$25 (New York Times, 2008). Let θ be the discount factor, where $\theta \in (0, 1)$, so that the value of the gray product is $V_G = \theta V_H$. To rule out trivial cases, we further assume that $\frac{\theta^2}{4} v_h < v_l < \theta v_h$, which implies that v_l, compared with v_h, should not be too large such that the retailer never diverts products or too small such that all the products are diverted.[3]

The two-separate-one-gray-market model is widely adopted in the literature on gray markets (e.g., Ahmadi et al., 2015; Ahmadi & Yang, 2000; Iravani et al., 2013; Maskus & Chen, 2002; 2004; Xiao et al., 2011). This paper differs in that we model the unique role of manufacturer-to-consumer rebates and in the process show how they can be used to manage gray market. Besides, for simplicity and clearer intuitions, we normalize all possible costs to zero.[4]

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[1] The main results of this paper are not qualitatively changed if we assume that the two markets have different consumer bases.

[2] In Section 4, we will examine the "indirect-indirect" setting where the manufacturer sells indirectly in both markets. Other market structures such as "direct-direct" and "indirect-direct" are not considered in this paper because in these settings there is no retailer or the retailer never diverts products.

[3] When $v_l \geq \theta v_h$, the retailer never diverts products. When $v_l \leq \frac{\theta^2}{4} v_h$, the retailer tends to divert all the goods to gray market, under which case the manufacturer has no reason to cooperate with the retailer.

[4] In Section 4, we will discuss the influences of promotion cost incurred by the manufacturer and the diversion cost incurred by the retailer.