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Equilibrium Price Communication and Unadvertised Specials by Competing Supermarkets

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Abstract

This paper is concerned with how retailers, supermarkets in particular, communicate price discounts and use unadvertised specials. A common practice for supermarkets is to communicate price deals on some products through newspaper advertisements, while communicating discounts on other products through in-store mechanisms such as shelf talkers. This raises the question: So far as store choice is concerned, how might consumers take into account not only advertised prices at competing stores, but also expected prices of unadvertised goods? It also begs the question of why stores have unadvertised specials since their effect on store choice is not quite the same as the advertised discounts. Further, competing supermarkets advertise the same products part of the time, and different products at other times. They also tend to sometimes advertise a product in consecutive weeks, but sometimes not. Can these actions be part of a strategy? We formulate a game-theoretic model of retail competition by first extending the work of Lal and Matutes (1994) and then developing an alternative framework to answer these questions. Our model has two retailers, each of whom carries two goods. To simplify exposition, we assume that the stores are symmetric, the two goods are symmetric in their reservation prices, and are neither substitutes nor complements. Consumers are identical in their preferences and consumer heterogeneity is in the convenience that each store presents to a representative consumer. The stores may advertise the price of one good, reflecting the reality that stores do not advertise their whole assortment. They compete through advertising and prices to maximize profits. We thus recognize the strategic role of advertised prices and furthermore, we investigate the strategic role of unadvertised prices in retail competition. For this model, we derive a Rational Expectations Nash equilibrium in which each store randomly advertises the price of one good following a mixed strategy. Consumer expectations of the prices of the unadvertised goods are rational. We obtain three kinds of results. First, unadvertised specials occur in equilibrium, and induce temporal and cross-sectional variation in the identity of advertised goods, consistent with casual observation. In this equilibrium, the two stores advertise the same good part of the time and different goods at other times. When they advertise the same good they do not offer any unadvertised discount on the other good. However, when they advertise different goods, they offer an unadvertised discount on the good that they do not advertise. Intuitively, unadvertised discounts come about because stores randomize the identity of the advertised good in the mixed strategy equilibrium. If retailers were to advertise the same good at all times, they would have to compete intensely for store traffic and therefore discount the advertised good very deeply. And, having done so, they would find it optimal to set the unadvertised good at the reservation price and offer no discount on it. However, if stores randomize the advertised good as shown in this paper, both stores advertise the same good some of the time and at other times they advertise different goods. Because they advertise different goods some of the time, they do not fight intensely for store traffic on just one good, but rather they find it optimal to offer a discount on the unadvertised good also. As a result, an implication of our equilibrium for consumer choice is that unadvertised discounts affect store choice, and in equilibrium some consumers may shop around. Second, we obtain managerial insights into the role of unadvertised specials. They affect store choice, prevent consumer shopping around either fully or partly, and reduce head-to-head competition on the price of the advertised good. The most salient strategic implication of retailers’ offering unadvertised discounts is to reduce competition among stores, and this is again due to the randomization strategy of the stores. In fact, stores can reduce head-to-head competition further by increasing the number of products in their assortment and randomizing on the advertised good from this assortment. Third, we provide a resolution of the Diamond (1971) paradox, which says that prices at competing stores approach the monopoly price. In our equilibrium, expected prices of both advertised and unadvertised goods are always below the monopoly price.

(Retailing; Supermarkets; Advertising; Pricing; Unadvertised Specials; Competition; Game Theory; Consumer Choice; Rational Expectations; Diamond Paradox)