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# Strategic Assortment Reduction by a Dominant Retailer

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In certain product categories, large discount retailers are known to offer shallower assortments than traditional retailers. In this paper, we investigate the competitive incentives for such assortment decisions and the implications for manufacturers' distribution strategies. Our results show that if one retailer has the channel power to determine its assortment first, then it can strategically reduce its assortment by carrying only the popular variety while simultaneously inducing the rival retailer to carry both the specialty and popular varieties. The rival retailer then bears higher assortment costs, which leads to relaxed price competition for the commonly carried popular variety. We also show that when the manufacturer has relative channel power, it chooses alternatively to distribute both product varieties through both retailers. Our analysis suggests, therefore, that when a retailer becomes dominant in the distribution channel, it facilitates retail segmentation into discount shops, carrying limited product lines, and specialty shops carrying wider assortments. We also illustrate how retailer power leading to strategic assortment reduction can lead to lower consumer surplus.

*Key words:* channels of distribution; channel power; assortment; retailing

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## 1. Introduction

Retailers and manufacturers are often subject to the decisions of a small circle of retailers that include mass merchandisers and wholesale clubs. These mass retailers and warehouse clubs are known to abandon certain specialty varieties and devote more shelf space to the more popular, high-volume brands.<sup>1</sup> By carrying fewer stock-keeping units (SKUs), they can cut their costs by making it easier to handle products and manage shelf space (Drèze et al. 1994). Two obvious consequences of reducing assortments are improvements in the bottom line and the ability to offer more competitive prices. But when a dominant discount retailer decides not to carry a manufacturer's specialty products, it may have an effect on the distribution decisions by other channel members. If the

dominant retailer is strategic, it evaluates the decisions of other channel members when making its assortment plans. This paper evaluates this aspect of the assortment decision.

Traditionally, it was the manufacturer who defined the breadth of its product line and distributed all varieties through complying retailers. The manufacturer's decision criterion of whether to distribute a variety was whether there was sufficient demand to cover production and distribution costs. However, these notions of channel management must be reexamined in light of the well-documented shift in channel power toward major retailers (Kadiyali et al. 2000). Indeed, these large retailers dictate to their vendors what should be made, in what colors, in what sizes, and what they are made of (Munson et al. 1999). Our objective is to identify the consequence of this power shift on manufacturer's distribution decisions.

The additional channel power enjoyed by these dominant retailers extends beyond the question of product line. In fact, dominant retailers (most notably Wal-Mart) are associated with large, efficient operations and are also known to use their power to

<sup>1</sup> For example, Wal-Mart has only a limited selection in various product categories that include groceries (O'Keefe 2002) and baby goods (Desjardins 2005). Another successful mass merchant, Target, also has a limited assortment in different categories that range from consumer electronics (Master 2001) to automobile supplies (*Discount Store News* 1999).

negotiate more strongly on wholesale price and delivery terms (e.g., Fishman 2006). As such, the notion of retail dominance has many dimensions, all of which we cannot examine in a single study. Rather, we focus on a single aspect of retailer dominance, namely, the ability of a retailer to dictate to its suppliers what products to develop and what products it will carry.<sup>2</sup> Our results indicate that this gain in channel power is sufficient to upset the distribution outcome relative to the case when the manufacturer has full distributional control. We show that the shift in channel power toward a dominant retailer may have profound implications on the way a manufacturer's products are distributed, the profitability of a channel and its members, the degree of competition between retailers, and on consumer welfare.

In this paper, we use an analytical model of a manufacturer and two competing retailers to ask how distribution outcomes change when slightly shifting some authority in one of the channels. We find that a dominant retailer may have a profit incentive to refuse to distribute specialty varieties, which *extends* beyond its own operational costs. In particular, if this retailer is strategic, it anticipates that competing retailers may choose to continue carrying a full line of products and, consequently, maintain high assortment costs. This passes on additional benefits to the dominant retailer in the form of *relaxed price competition* for the popular products. We show that such asymmetric distribution outcomes can arise by a shift in channel distribution authority to one of the retailers.<sup>3</sup> We refer to this outcome as *strategic assortment reduction* and use our model to determine the conditions under which this arises.

Strategic assortment reduction occurs when a manufacturer prefers to distribute its full product line through a retailer, but when dominant, this retailer would rather choose to carry only the popular variety. As such, it reflects channel conflict or diverging incentives between a manufacturer and an independent retailer about the assortment decision. These diverging incentives arise when the manufacturer is unable to set channel specific wholesale prices. Benefits that

**Table 1** Sample of Assortment Breadths at Selected Discounters and Specialty Stores

Product	Number of SKUs		
	Wal-Mart	Target	Specialty store
Tazo tea	5	5	9 (Giant Eagle Grocery)
T-Fal skillet	10	8	15 (Linens-n-Things)
Callaway golf balls	4	4	5 (Dick's Sporting Goods)
KitchenAid stand mixer	1	3	7 (Linens-n-Things)
Graco infant car seats	1	2	8 (Babies R Us)
Coleman tents	1	2	6 (Dick's Sporting Goods)
Graco play yards	2	2	7 (Babies R Us)

accrue to the channel through lower assortment costs in one channel are not fully captured by the manufacturer because its uniform wholesale price must reflect demand across the entire set of retailers.

Note that otherwise symmetric retailers may, in fact, carry different assortments. When one retailer wants to abandon a specialty variety, this lowers competition for it, thereby adding an incentive for another retailer to continue carrying it despite the additional assortment costs. A sample of retail stores in the Pittsburgh metropolitan area illustrates this asymmetry in assortment outcomes. Table 1 shows the breadth of assortment at large discounters Wal-Mart and Target in comparison to specialty stores. For these seven product categories, these two discounters carry narrower assortments. Our research indicates that a shift in channel authority may play a role in this observation and suggests a contributing factor to the on going segmentation in the retail industry.

This is in line with a folk wisdom in retailing that tells other, nondominant retailers who compete against low-cost discounters such as Wal-Mart to find a niche rather than trying to duplicate the low pricing strategy. For example, Rigby and Haas (2004) suggest that a substantial segment of consumers is willing to pay nondiscount prices in return for a wider assortment.<sup>4</sup>

In addition to shifting authority, assortment costs play a role in our results. As acknowledged by Hoch et al. (1999), there is industry-wide recognition that there are significant costs of carrying large assortments. When a retailer has to manage a larger number of SKUs, there are elevated costs of warehousing, personnel and computer time, and shelving (Bloom et al. 2000).

<sup>2</sup> According to *BusinessWeek*, Wal-Mart heavily influences product specifications and tells manufacturers which products to develop (Bianco et al. 2003). For example, Fishman (2006) reports the efforts of Wal-Mart to influence how Snapper lawn mowers are made. *BusinessWeek* also cites Rubbermaid working carefully to adjust its product assortment for power retailers and Black & Decker seeking input from giant home improvement chains including Home Depot at the earliest stages of product development (Schiller et al. 1992).

<sup>3</sup> In our model, we show that if a retailer is dominant, it has an incentive to reduce its assortment. On the other hand, a retailer can have reduced assortment but may not be dominant. Indeed, convenience stores such as 7-Eleven have smaller assortments. Their assortment is not a result of their dominance but for other reasons such as shopping convenience or limited square footage.

<sup>4</sup> According to *Fortune*, this is how Central Market, a gourmet superstore recently opened by San Antonio-based H. E. Butt Grocery Co., whose H-E-B chain is the second-largest private supermarket business in the country, competes with Wal-Mart. Central Market has a huge selection, including 30 types of apples, 20 kinds of homemade sausage, 2,300 labels of wine, and 400 types of beer (O'Keefe 2002).

The growth of the discount retail format has raised concern about the availability of specialty products and the impact on consumer welfare. Given the size and dominance of these discounters, some critics argue that their narrow assortments make specialty varieties harder to find (e.g., Bianco et al. 2003). Our research formally investigates these issues providing results that support and in some instances, refute critics' concerns.

Our model also permits us to measure the consequence of strategic assortment reduction on consumer welfare. We show that when channel authority is shifted from the manufacturer to a dominant retailer it leads to unambiguously lower levels of consumer surplus. The intuition is that a retailer does not account for double marginalization losses in competing retail channels and is, therefore, quicker to abandon a specialty variety before the manufacturer would. Because retailers carrying a specialty variety have less downstream competition, double marginalization inefficiencies are enhanced. Consumers, on the whole, suffer as a result of strategic assortment reduction. This result, therefore, legitimizes some of the critics' concerns about the detriment of retail dominance on consumers.

In general, our work falls in line with the growing body of research investigating the implications of shifting channel power in the retail sector. Dukes et al. (2006), Iyer and Villas-Boas (2003), and Raju and Zhang (2005), for example, examine the implications of changing channel power on the distribution of channel profits. The current work, in contrast, examines the implications of this shift of channel power on distribution and product line decisions. This is somewhat similar to the work of Geylani et al. (2007), which investigates the implication of this shift on manufacturers' joint promotions and advertising decisions, and the work of Luo et al. (2007), which introduces a method for product design in the context of dominant retailers.<sup>5</sup>

More specifically, our paper contributes to the literature on retailing, variety, and assortment. There is a substantial literature in marketing that examines the trade-offs associated with assortment decisions. The early work of Baumol and Ide (1956) shows that the benefit of wide assortments in attracting customers must be balanced with the additional stocking and inventory costs; Nilsson and Høst (1987) offer operational tools to navigate these costs and benefits. Although this trade-off is examined in our paper, we take a broader look at the impact of a stores' assortment on decisions upstream and across to competing stores.

More recently, Messinger and Narasimhan (1997) empirically identify a trend in consumers' assessment of the assortment trade-off. Specifically, they show that growing opportunity costs of shopping (e.g., higher wages) have increased the value of assortment to grocery stores. Alternatively, Gourville and Soman (2005) show how wider assortments can impose a cognitive cost on consumers. Hoch et al. (1999) why and by how much a consumer cares about assortment at a given store. Briesch et al. (2009) examine the impact of assortment on consumers' grocery store choice. Alternatively, Boatwright and Nunes (2001), Borle et al. (2005), and Broniarczyk et al. (1998) evaluate the impact of a retailer's assortment reduction on sales, customer retention, and consumers' perception of the variety, respectively, at a given store. All of these works provide a deep examination of the impact of assortment on consumers' choices and perceptions. By contrast, we abstract from the consumer decision to evaluate the impact of a retailer's assortment decision on channel management and distribution.

Allain and Waelbroeck (2006) and Inderst and Shaffer (2007) evaluate the impact of retail concentration on upstream incentive to offer product variety. They argue that retail concentration may explain the documented reduction in new CD releases by limiting manufacturers' ability to segment the market (e.g., with new and old releases). Inderst and Shaffer (2007) show how a merger of noncompeting retailers can commit to fewer product varieties to leverage market power over consumers, thereby increasing its upstream buyer power. This encourages manufacturers' to narrow their product lines. The result is an overall decline in economic welfare. By contrast, we focus on the strategic incentive of one retailer over another with respect to its assortment decision.

By focusing on the strategic incentives behind the assortment decision, our research is related to Cachon and Kök (2007) who demonstrate how decentralized assortment decisions (with the use of category managers) can be suboptimal. Similarly, our research shows that assortment outcomes may differ depending on the agent making the assortment decision. However, we compare the retailer and the manufacturer as the assortment decision maker while Cachon and Kök (2007) compare decision makers within the retailer.

Finally, this paper contributes to research on retail segmentation. Bhatnagar and Ratchford (2004) identify consumer heterogeneity with respect to breadth of assortment as a significant factor in determining consumer choice across retail formats. Krishnan et al. (2002) illustrate how this heterogeneity can cause retailers to differ on or reconsider a commitment to consistent assortment. Our paper contributes to this reasoning by further suggesting that retail dominance

<sup>5</sup> Similarly, Kumar and Rao (2006) show how a retailer can use basket composition to improve its pricing across its product assortment.

also plays a natural role in segmenting discount stores from specialty stores. Zhu et al. (2008) point out that the location of an entering discount retailer plays a role in altering consumer shopping patterns by inducing traditional incumbent retailers to segment across income levels. Our paper illustrates how resultant segmentation may arise simply from incentives within the channel.

The general model is presented and analyzed in the next section. This section also characterizes the equilibrium outcomes in both variants of the model: the manufacturer-dominant model and the retailer-dominant model. Section 3 evaluates the consequences of strategic assortment reduction on consumer welfare. Section 4 summarizes and concludes with managerial implications. Omitted details of our analysis and all proofs of propositions are contained in a separate Technical Appendix, available online or from the authors.<sup>6</sup> The Technical Appendix also provides supporting analysis for incidental claims in the main text.

## 2. A Model of Assortment Choice

The objective of our analysis is to illustrate the consequences of retailer dominance on assortment outcomes. As such, our analytics can be seen as a controlled exercise to isolate the impact of changing the assortment decision maker. We consider a game-theoretic model consisting of three players: two retailers,  $A$  and  $B$ , and a manufacturer,  $M$ . The manufacturer has two products in its product line (product 1 and 2) and distributes these products to two competing retailers. In stage 1,  $M$  decides its distribution plan and sets wholesale (supply) prices for the products it sells. In stage 2, retailers  $A$  and  $B$  choose quantities, which are subsequently stocked and sold. We consider two variants of this model. Each variant depicts one of the two channel-dominant settings investigated. In the  $M$ -Dominant game,  $M$  fully determines the assortments for both the retailers in stage 1. This is contrasted with the  $A$ -Dominant game, which has an additional starting stage, referred to as Stage 0, in which retailer  $A$  announces which products it will (or will not) carry in its assortment. Subsequently, in stage 1,  $M$  decides what to distribute through retailer  $B$ . We use this notion of dominance to illustrate the profound impact of a shift in channel distribution authority to one of the retailers. As we show, this additional channel power is sufficient to alter the equilibrium distribution, which may lower consumer welfare and, in some cases, be Pareto-inferior for the channel.

The trade-off in the assortment decision concerns assortment costs, which are defined by expenses associated with moving and sorting additional SKUs. These costs are incurred by the retailer and depend on the number of products carried. Specifically, we assume that each retailer faces the same marginal (assortment) cost function,  $c(n)$ , where  $n$  is the number of this manufacturer's products it carries and  $c(2) > c(1) \geq 0$ . This suggests that carrying a lower number of SKUs, may lower a retailer's marginal costs.<sup>7,8</sup> For example, a retailer that sells only one variety of CD does not need to arrange the CDs alphabetically or by genre. However, when the retailer chooses to sell two or more varieties, it will have to sort the CDs, which will increase the retailer's marginal cost for all the varieties it carries. While these costs are borne directly by the retailer, they have implications for the manufacturer's distribution strategy because assortment costs affect channel margins.

In the manufacturer's product line, the products can be thought of as two varieties, which are horizontally, but not vertically, differentiated.<sup>9</sup> In addition, one variety is more popular than the other. For example, a CD manufacturer makes and distributes many varieties of music. There is a new CD from a popular band and one from a lesser-known band. Product 1 denotes the popular variety and product 2 the specialty variety. To simplify the analysis and clarify the strategic incentive in assortment reduction, we impose the assumption that these products do not compete with each other. We analyze the last two stages of the model as follows.

During stage 1, the manufacturer sets a wholesale price  $w_i$ , for each product  $i$ , provided it is to be sold. Retailers then choose quantities in stage 2. Let  $q_{ij}^j$  be the amount of product  $i$  bought by retailer  $j = A, B$ . Retailers sell this quantity to the market. The retail price of each product is determined by the total quantity in the market,<sup>10</sup>

$$p_i(q_i^A, q_i^B) = a - b_i(q_i^A + q_i^B), \quad (1)$$

<sup>7</sup> Note that this cost structure is not at odds with the possible economies of scope (average costs decreasing in  $n$ ) that retailers might enjoy. This is illustrated in the Technical Appendix.

<sup>8</sup> There may be other types of assortment costs that decrease in  $n$ . For example, once a system is set up to monitor and track one SKU, it may be easier to add new ones. In the Technical Appendix, using an assortment cost function that includes both the monitoring cost, and the moving and sorting costs used in the text, we show that a marginal assortment cost increase in assortment size is not at odds with a decrease in marginal monitoring cost.

<sup>9</sup> Specifically, we do not consider the case in which one of the varieties is of higher quality.

<sup>10</sup> In the Technical Appendix, we show how the channel incentives derived here are also present in a price setting situation (*Bertrand*). We maintain the quantity setting case (*Cournot*) here for expositional conveniences.

<sup>6</sup> The Technical Appendix can be found at <http://mktsci.pubs.informs.org>.

where  $a > 0$  and  $b_1 < b_2$ . This specification captures our assumption that product 2 is a specialty variety. A larger coefficient  $b$  indicates that, for some fixed quantity  $q$ , a lower price is needed to clear the shelves of the specialty product—lower than the price for the popular one. In other words, when priced the same, there will be more sales of the popular product than of the specialty. Note that we assume the price of variety  $i$  does not depend on the price of variety  $j$ , implying that the two varieties do not directly compete.<sup>11</sup>

Let  $c^j = c(n^j)$ ,  $j = A, B$  denote the retailers' marginal cost depending on the number  $n^j$  of varieties carried. Retailer  $j$ , if she is to carry product  $i$ , chooses a quantity,

$$q_i^j = \arg \max_{q > 0} [a - b_i(q + q_i^{-j}) - c^j - w_i]q,$$

where  $q_i^{-j}$  represents the quantity of product  $i$  carried by the rival retailer. If retailer  $j$  does not carry product  $i$  then  $q_i^j = 0$ . This yields the stage 2 quantities

$$q_i^j = \begin{cases} 0 & \text{if } j \text{ does not carry } i, \\ \frac{a - w_i - 2c^j + c^{-j}}{3b_i} & \text{otherwise,} \end{cases} \quad (2)$$

and profit to retailer  $j$  from product  $i$

$$\Pi_i^j = [p_i(q_i^A, q_i^B) - c^j - w_i]q_i^j. \quad (3)$$

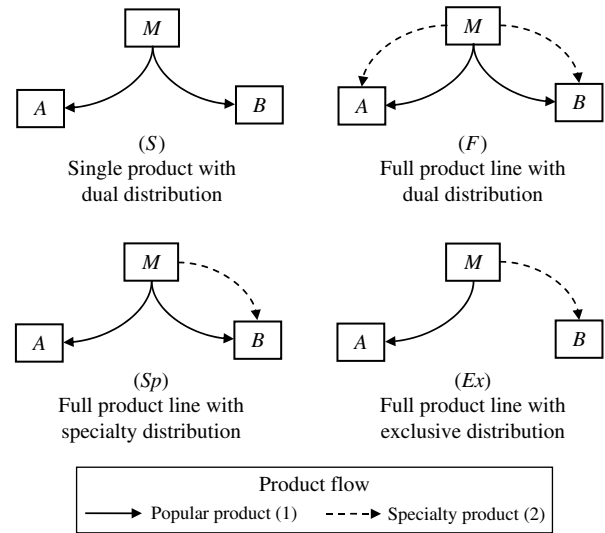
Total profits for retailer  $j$  are the product profits in Equation (3) summed over products:  $\Pi^j = \sum_{i=1,2} \Pi_i^j$ . Given the quantities expressed in Equation (2),  $M$  chooses wholesale prices in stage 1 to maximize profits. Because of the competitive independence of products 1 and 2, profit maximization is equivalent to maximizing individual product profits, defined by

$$\Pi_i^M = w_i(q_i^A + q_i^B), \quad (4)$$

subject to Equation (2) over  $w_i \geq 0$  for  $i = 1, 2$ . Total profits for the manufacturer are the product profits in Equation (4) summed over products:  $\Pi^M = \sum_{i=1,2} \Pi_i^M$ . Using  $M$ 's first-order conditions for this maximization and the retailers' optimal reactions in Equation (2), a straightforward derivation leads to a general characterization, which, for brevity, is relegated to Lemma TA.1 of the Technical Appendix, available at <http://mktsci.pubs.informs.org>. This characterization allows us to simplify the analysis by considering four relevant distribution outcomes, depicted in Figure 1.

In the first outcome, the manufacturer distributes only the popular product, i.e., product 1. We call

Figure 1 Distribution Outcomes



this outcome *single product with dual distribution* (S). Note that because the market for product 2 is smaller, distribution of only product 2 through both retailers is always dominated by distribution of only product 1. Forthwith, we ignore the single distribution of product 2. A second outcome, which we call *full product line with dual distribution* (F), involves selling the entire product line through both retailers. As an asymmetric case, it is possible to have product 1 distributed through retailer A and both products through retailer B. This we term as *full product line with specialty distribution* (Sp). Finally, a *full product line with exclusive distribution* (Ex), wherein each retailer is given exclusive sale of one of the two products, is possible.

Obviously, the distributional arrangements depicted above do not represent all possibilities. We omit all strategically dominated arrangements such as distribution S with product 2, as mentioned. Similarly, distributing both products exclusively through one retailer is dominated by Ex whenever assortment costs are strictly positive. Finally, note that distributions Sp and Ex each have mirror counterparts with respect to retailers A and B. However, we have assumed that retailers are symmetric, which implies that the outcomes depicted in Figure 1 (weakly) dominate them for  $M$ . This is not the case, however, when retailers have asymmetric assortment costs. We return to this case in §2.3.

Without loss of generality, we normalize assortment cost by defining  $c \equiv c(2) > c(1) = 0$ . This normalization offers the interpretation that  $c$  represents the increase in unit cost of carrying an additional product. Under this assumption, the relevant payoffs and quantities can be compactly expressed. For example, a retailer that sells only one variety of CD

<sup>11</sup> This is done for simplicity. As we discuss in §4, the presence of competition between varieties tends to reinforce the basic motive for strategic assortment reduction.

**Table 2** Payoffs and Quantities in the Distribution Outcomes of Figure 1

Outcome:	$S$	$F$	$Sp$	$Ex$
$M$ Profit	$\Pi_S^M = \frac{a^2}{6b_1}$	$\Pi_F^M = \frac{(a-c)^2}{6b_1} + \frac{(a-c)^2}{6b_2}$	$\Pi_{Sp}^M = \frac{(a-c/2)^2}{6b_1} + \frac{(a-c)^2}{8b_2}$	$\Pi_{Ex}^M = \frac{a^2}{8b_1} + \frac{a^2}{8b_2}$
$A$ Profit	$\Pi_S^A = \frac{a^2}{36b_1}$	$\Pi_F^A = \frac{(a-c)^2}{36b_1} + \frac{(a-c)^2}{36b_2}$	$\Pi_{Sp}^A = \frac{(a+5c/2)^2}{36b_1}$	$\Pi_{Ex}^A = \frac{a^2}{16b_1}$
Quantity	$q_1^A = \frac{a}{6b_1}$	$q_i^A = \frac{a-c}{6b_i}, \quad i=1,2$	$q_1^A = \frac{a+5c/2}{6b_1}$	$q_1^A = \frac{a}{4b_1}$
$B$ Profit	$\Pi_S^B = \frac{a^2}{36b_1}$	$\Pi_F^B = \frac{(a-c)^2}{36b_1} + \frac{(a-c)^2}{36b_2}$	$\Pi_{Sp}^B = \frac{(a-7c/2)^2}{36b_1} + \frac{(a-c)^2}{16b_2}$	$\Pi_{Ex}^B = \frac{a^2}{16b_2}$
Quantity	$q_1^B = \frac{a}{6b_1}$	$q_i^B = \frac{a-c}{6b_i}, \quad i=1,2$	$q_1^B = \frac{a-7c/2}{6b_1}; \quad q_2^B = \frac{a-c}{4b_2}$	$q_2^B = \frac{a}{4b_2}$

does not need to arrange the CDs alphabetically or by genre. However, when the retailer chooses to sell two or more varieties, it will have to sort the CDs. This will increase the retailer's marginal cost for all the varieties it carries, which we show in the following proposition.

**PROPOSITION 1.** Let  $c < a$  and  $b_1 < b_2$ . Payoffs in the four distribution outcomes given in Figure 1 are expressed in Table 2.

Proposition 1 allows us to reduce the analysis of both the  $M$ - and  $A$ -Dominant games to a series of comparisons in payoffs. Our interest is in understanding the impact of retail dominance on the distribution outcome. To do this we identify regions of the parameters space in  $a$ ,  $c$ ,  $b_1$ , and  $b_2$  such that, if held constant, the equilibrium distribution outcome changes when dominance changes—moving from the  $M$ -Dominant regime to the  $A$ -Dominant regime.

### 2.1. The $M$ -Dominant Game

In the  $M$ -Dominant version of the game,  $M$  announces which products it expects the two retailers to carry. By contrast, in the  $A$ -Dominant version of the game, retailer  $A$  declares which of the manufacturer's products it will and will not handle. The manufacturer then decides how to distribute its products under the constraint imposed by  $A$ 's declaration.

We first consider the  $M$ -Dominant regime and examine what distributional arrangements are optimal for  $M$ , given the parameters  $a$ ,  $c$ ,  $b_1$ , and  $b_2$ . This is done by a straightforward comparison of  $M$ 's profits in the first row of Table 2 over the parameter space. The orderings of these profits depend on the two ratios  $c/a \in [0, 1]$  and  $b_1/b_2 \in [0, 1]$ . The first ratio represents the size of the assortment cost relative to the market size for the product category. The second ratio measures the distribution of the market across the two varieties. In particular, the larger the ratio, the more equally the market is distributed over the two varieties.

Figure 2 depicts  $M$ 's optimal outcome, and therefore the equilibrium of the  $M$ -Dominant game for any given parameter constellation ( $b_1/b_2, c/a$ ). The curve denoted by  $f$  is defined by  $M$ 's indifference across distribution outcomes  $S$  and  $Sp$ . Similarly, the curves labeled  $g$  and  $h$  are defined by  $M$ 's indifference between outcomes  $Sp$  and  $F$  and between outcomes  $Ex$  and  $Sp$ , respectively.<sup>12</sup>

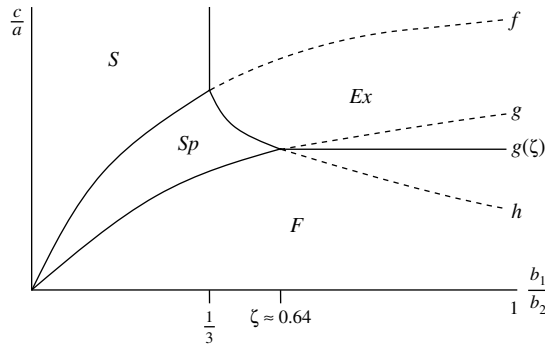
When  $b_1/b_2 < 1/3$ ,  $Ex$  is never optimal for  $M$ . Because product 1 is significantly more popular than product 2, it is always optimal for  $M$  to distribute product 1 through both retailers. For relatively high assortment costs,  $M$  chooses to only distribute the popular product through both retailers (outcome  $S$ ). As assortment costs decrease, it becomes optimal for  $M$  to introduce the specialty variety through one of the retailers (outcome  $Sp$ ). Finally, when assortment costs decrease sufficiently, full distribution through both retailers is optimal for the manufacturer (outcome  $F$ ).

On the other hand, when  $b_1/b_2 > 1/3$ ,  $S$  is never optimal for  $M$ . In this region the manufacturer views the two products similarly and outcomes  $Ex$  and  $F$  dominate the parameter space. That is, when products are more similar in market size,  $M$ 's trade-off is simply the benefit of additional revenue from broader market coverage versus the channel losses from assortment costs. Therefore, it is optimal for  $M$  to establish exclusive territories for each product (outcome  $Ex$ ) when assortment costs are larger than  $g(\xi) = 1 - \sqrt{3}/2$ , but to otherwise open the market for both products (outcome  $F$ ) for low assortment costs.

The preceding analysis of the  $M$ -Dominant game sets the benchmark for comparing  $M$ 's optimal distribution strategy with that desired by a dominant retailer. Note that the model generates all possible equilibrium outcomes and, therefore, offers a

<sup>12</sup> The technical arguments leading to Figure 2 are provided in Proposition TA.1, found in the Technical Appendix.

Figure 2 Equilibrium Outcomes in *M-Dominant* Game



parsimonious characterization of *M*'s distribution incentives with respect to assortment costs and demand conditions.

## 2.2. The *A-Dominant* Game: Strategic Assortment Reduction

We now turn to an analysis of the *A-Dominant* game. In this section, retailer *A* has the channel power only with regard to its assortment. This added channel power ensures that *A* is never worse off relative to the *M-Dominant* game. What to distribute through retailer *B* remains in *M*'s control. Obviously, if it is optimal for *M* to distribute only one product—always product 1—through retailer *A*, then *A* will never refuse to carry it and, as a result, *A*'s channel power would be of no consequence. Therefore, the relevant region for the analysis of the *A-Dominant* game is the region in which it is optimal for *M* to choose *F* in the *M-Dominant* game. For precision, we define the following notation. Let  $\Lambda = \{Sp, Ex, S\}$  be the set of possible outcomes in which retailer *A* does not carry product 2 and  $\Theta \subset [0, 1]^2$  be the parameter space such that  $\Pi_F^M > \Pi_x^M$  for all  $x \in \Lambda$ . Specifically,

$$\Theta = \{(b_1/b_2, c/a) \in [0, 1]^2 \mid c/a < \min\{g(b_1/b_2), g(\zeta)\}\},$$

which corresponds to the lower region of the graph in Figure 2.

Refusing to carry product 2 is optimal for *A* only if she prefers another outcome  $x \in \Lambda$  over *F*. This is a necessary, but not sufficient, condition for strategic assortment reduction. In particular, if retailer *A* is fully strategic, then she evaluates the consequences of refusing to carry product 2 on *M*'s distribution strategy in its other retail channel. Suppose that *A* rejects product 2 in period 0. Then *M* has three options with respect to retailer *B*: distribute both varieties, product 1 only, or product 2 only. This corresponds to the outcomes in  $\Lambda$ . We can now state the exact conditions for a *strategic assortment reduction* in equilibrium as follows:  $x$  is a strategic assortment reduction equilibrium outcome if and only if the following two conditions hold:

- (i)  $\Pi_x^A > \Pi_F^A$ ; and
- (ii)  $\Pi_x^M > \Pi_y^M$  for all  $y \neq x$ ;  $y \in \Lambda$ .

Condition (i) says that retailer *A* has an incentive to change the outcome from *F*, while condition (ii) requires that *M*'s subsequent distribution strategy be optimal given that *A* does not carry product 2.

From (ii), we can immediately rule out *S* as a possible equilibrium outcome in this game. Recall that *M* prefers the outcome *Sp* to *S* in regions below the curve *f* in Figure 2. Since  $\Theta$  lies entirely below the curve *f*, assortment costs are always sufficiently low so that *M* prefers to distribute both varieties through *B* over distributing only product 1.

With *S* ruled out as an optimal choice for *M*, we can use the previous results to determine her optimal choice between *Ex* and *Sp* for parameters in  $\Theta$ . In particular, because the curve defined by *h* determines *M*'s indifference between these two outcomes, we conclude that *M* prefers *Ex* for regions of  $\Theta$  above *h* and *Sp* for regions below *h*.

We turn to condition (i) to determine retailer *A*'s optimal decision whether to carry product 2 given *M*'s reaction described above. First, observe that a comparison of profit expressions in Proposition 1 yields *F* as retailer *A*'s preferred outcome over *Sp* if and only if

$$c/a < k(b_1/b_2) \equiv \frac{\gamma - 1}{\gamma + 5/2}, \quad \text{where } \gamma \equiv \sqrt{1 + \frac{b_1}{b_2}}. \quad (5)$$

The indifference curve defined by *k* lies everywhere below *g*, which implies that *F* is the equilibrium outcome of the *A-Dominant* game for all  $(b_1/b_2, c/a)$  with  $c/a < k(b_1/b_2)$ . This can be seen in Figure 3.<sup>13</sup> That *A*'s indifference curve lies everywhere below *M*'s (i.e., that *k* lies everywhere below *g*) reflects the central aspect of channel conflict behind strategic assortment reduction: *A* is willing to reject the specialty variety at lower costs than *M* would prefer.

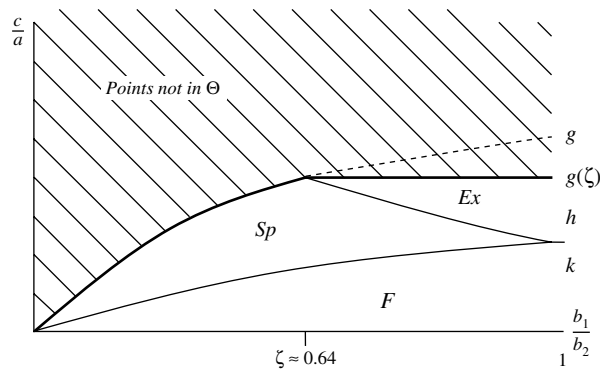
In the regions of  $\Theta$  above *k* and below the curves *g* and *h*, retailer *A* prefers *Sp* over *F* and the manufacturer earns the highest profit with *Sp*, given that she cannot implement *F*. Thus, *Sp* must be the equilibrium outcome in this region.<sup>14</sup>

Finally, we examine *A*'s preferences in the remaining sector of  $\Theta$  above the curve *h*, which is the region where *M* prefers exclusive distribution (*Ex*) in reaction to *A* not carrying product 2 (see §2.1). This is readily checked by comparing profits  $\Pi_{Ex}^A$  and  $\Pi_F^A$ . *A* clearly prefers *Ex* over *F*, which implies that condition (i) holds in this region for *Ex*. This argument establishes the equilibrium outcomes of the *A-Dominant* game, which are depicted in Figure 3, and gives the following result.

<sup>13</sup> The technical arguments leading to Figure 3 are provided in Proposition TA.2 in the Technical Appendix.

<sup>14</sup> We point out that retailer *B* is always content to carry product 2 despite the fact that retailer *A* has abandoned it.



**Figure 3** Equilibrium Outcomes in A-Dominant Game

**PROPOSITION 2.** Let  $(b_1/b_2, c/a)$  be in  $\Theta$ .

(i) For significant assortment costs,  $c/a > k(b_1/b_2)$ , strategic assortment reduction is an equilibrium outcome. Specifically, either  $Sp$  or  $Ex$  is the (unique) equilibrium outcome of the A-Dominant game while  $F$  is the equilibrium outcome of the M-Dominant game.

(ii) Otherwise, when  $c/a < k(b_1/b_2)$   $F$  is the equilibrium outcome of both the A-Dominant and M-Dominant games.

Proposition 2 establishes that  $A$ 's dominance in determining assortment may, in fact, alter the distribution of  $M$ 's products. Specifically, when  $Ex$  or  $Sp$  is the equilibrium of the A-Dominant game,  $M$  would choose  $F$  in the M-Dominant game. As indicated in the second part of the proposition, however, significant assortment costs accompany the diverging assortment decisions.

A deeper interpretation for this key result is supported by Figure 3. The regions above curve  $k$  indicate when strategic assortment reduction is an equilibrium outcome. The intuition behind  $M$  and  $A$ 's diverging preferences can be seen and understood when the channel member switches from  $F$  to  $Sp$  as assortment costs increase. As indicated in Figure 3,  $A$ 's indifference curve  $k$  lies everywhere below  $M$ 's indifference curve  $g$ . For any fixed market size distribution,  $b_1/b_2$ , retailer  $A$  prefers  $Sp$  over  $F$  for lower assortment costs  $c/a$  than does  $M$ . This is because  $A$  accrues benefits from higher assortment costs in the  $Sp$  outcome (from Proposition 1,  $\partial \Pi_{Sp}^A / \partial c > 0$ ). When  $A$ 's rival  $B$  has higher costs, its retail price for product 1 is higher, and  $A$  benefits from the relaxed price competition as a result.

The manufacturer,  $M$ , on the other hand, does not fully benefit from this relaxed retail price competition because it is unable to price discriminate, by assumption. Thus it cannot unilaterally raise its wholesale price to capture the additional channel surpluses with  $A$ . In fact,  $M$  is forced to reduce its uniform wholesale price (in  $Sp$ ,  $w_1 = (1/2)(a - c/2)$ ) as assortment costs increase, which is another benefit for  $A$  in the  $Sp$  outcome. These benefits imply that  $A$  will abandon product 2 before it is optimal

for  $M$  to do so. Therefore,  $Sp$  is a strategic assortment reduction equilibrium in the region indicated by Proposition 2.

An illustration of this result can be seen in the market for CDs. Retailers incur significant assortment costs for selling CDs. Mass merchant outlets such as Best Buy, Target, and Wal-Mart, which together account for more 50% of the retail sales, carry a very limited number of titles. In fact, Wal-Mart carries less than 3% of the titles that are released every year and only the most popular ones (Public Broadcasting Service 2007).

There is a broader marketing implication from this result, which can be seen in the context of the retail segmentation. In the strategic assortment reduction outcome  $Sp$ , the dominant retailer,  $A$ , lowers its costs while inducing higher costs on its rival. In addition,  $A$  carries higher volumes than  $B$ :  $q_1^A - q_1^B = c/b_1 > 0$ . Our analysis suggests, therefore, that when a retailer becomes dominant in the distribution channel, it may facilitate retail segmentation into discount shops that carry large volumes of limited product lines, and specialty shops, which carry wider assortments and harder to find varieties.

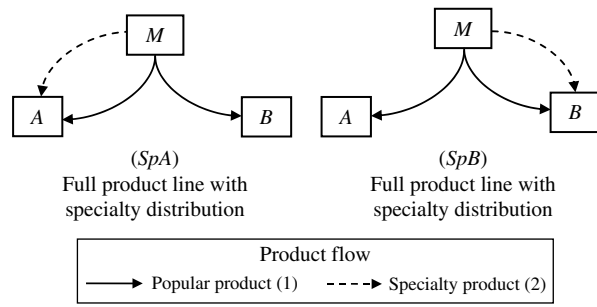
Finally, note that according to Proposition 2, exclusive distribution of products 1 and 2 ( $Ex$ ) can also be a strategic assortment reduction outcome in equilibrium. This comes from the fact that in regions above the indifference curve  $h$ ,  $M$  prefers  $Ex$  over  $Sp$ . As product 2 becomes relatively more popular (higher  $b_1/b_2$ ),  $M$  favors exclusive distribution and does not incur the channel losses associated with higher assortment costs. Unlike in the  $Sp$  outcome discussed above,  $Ex$  affords the manufacturer individualized wholesale pricing. Thus, the added channel surplus that comes with low retail costs can be absorbed with wholesale price,  $w_2$ .

In contrast,  $A$  would prefer that  $M$  distribute product 1, in addition to product 2, through retailer  $B$  and increase his assortment costs. Specifically, when retailer  $A$  refuses to distribute product 2, she would actually prefer that  $M$  implement  $Sp$  rather than  $Ex$ . Consequently, in the A-Dominant game, retailer  $A$  forces an outcome that is second best for itself. Nevertheless,  $A$ 's refusal to carry product 2 is strategically optimal since  $F$  is a worse outcome than  $Ex$ .

### 2.3. Asymmetric Assortment Costs

We previously assumed that the only distinction between the two retailers was that  $A$  acquired the ability to move first and announced its refusal to carry one of the manufacturer's products. It is natural to suppose that this ability may come with other advantages, such as being more efficient. Suppose, for instance, that retailer  $A$  has lower assortment costs than retailer  $B$ . From the overall channel perspective, in this case, there are obviously advantages to using  $A$  to distribute both varieties. Recall the specialty

Figure 4 Specialty Distributions



distribution ( $Sp$ ) from Figure 1. If this is optimal for  $M$ , then clearly  $M$  would choose  $A$  over  $B$  for distributing the entire product line. This corresponds to  $SpA$  in Figure 4. The question we ask here is: Would  $A$  abandon the specialty variety even though it is more efficient in assortment than its rival  $B$ ? As we show, the answer is yes.

Formally, let  $0 = c^j(1) < c^j(2) \equiv c^j$  for  $j = A, B$  with  $c^A < c^B$ , which reflects the efficiency advantage of retailer  $A$  over  $B$ . We evaluate the consequence of a shift in channel power from the manufacturer to retailer  $A$  by considering the  $M$ -Dominant and  $A$ -Dominant games in a similar vein as before. To draw on the previous analysis, define  $c = (c^A + c^B)/2$  as the average assortment cost and consider points  $(b_1/b_2, c/a) \in [0, 1]^2$ , which lead to  $Sp$  in the  $M$ -Dominant game of §2.1. Specifically, restrict attention to the region defined by

$$\Theta_{Sp} = \{(b_1/b_2, c/a) \in [0, 1]^2 \mid g(b_1/b_2) < c/a < \min\{f(b_1/b_2), h(b_1/b_2)\}\},$$

which is the region denoted by  $Sp$  in Figure 2. By construction, all parameter constellations residing in  $\Theta_{Sp}$  lead to some form of specialty distribution as optimal for the manufacturer. The fact that  $c^A < c^B$  implies  $SpA$  is the optimal specialty distribution for  $M$  and is, thus, the equilibrium outcome in the  $M$ -Dominant game. In the case of asymmetric costs, *strategic assortment reduction* is said to occur whenever  $SpA$  is the equilibrium of the  $M$ -Dominant game, but  $SpB$  is the equilibrium of the  $A$ -Dominant game.

In the  $A$ -Dominant game, the question of whether  $A$  will abandon product 2 is determined by the order relation between profits

$$\begin{aligned} \Pi_{SpA}^A &= \frac{1}{36b_1} \left( a - \frac{7c^A}{2} \right)^2 + \frac{1}{16b_2} (a - c^A)^2 \quad \text{and} \\ \Pi_{SpB}^A &= \frac{1}{36b_1} \left( a + \frac{5c^B}{2} \right)^2, \end{aligned} \quad (6)$$

which can be derived applying Lemma TA.1 in the Technical Appendix, available at <http://mktsci.pubs.informs.org>. Given the profit expressions for  $A$  in Equation (6), the relative assortment cost differ-

ence increases  $A$ 's benefit from  $SpB$ . That is, the marginal benefit to  $A$  from switching from  $SpA$  to  $SpB$  is increasing in the cost asymmetry  $c^B - c^A > 0$ . Furthermore, this benefit is stronger for smaller ratios  $b_1/b_2$ . In fact,  $(b_1/b_2, c/a) \in \Theta_{Sp}$  and ensures that  $b_1/b_2 \leq \zeta \approx 0.64$ . This reasoning suggests that  $A$  will, always abandon product 2 whenever  $M$  finds it optimal to use  $A$  for a specialty distribution. This is formally established in Proposition 3.

**PROPOSITION 3.** Let  $c^A < c^B, (b_1/b_2, c^j/a)$  be in  $\Theta_{Sp}$  for  $j = A, B$ . Then  $SpA$  is the equilibrium outcome of the  $M$ -Dominant game and  $SpB$  is the equilibrium outcome of the  $A$ -Dominant game.

This result implies that despite greater efficiency in handling assortment,  $A$  prefers an inefficient rival to carry the burden of assortment. In addition, retailer  $A$  abandons the specialty variety in the  $A$ -Dominant game whenever and despite the fact that  $SpA$  is optimal for the manufacturer. This has direct implications for the channel. In particular,  $A$ 's dominance will always lower channel efficiencies. Moreover, because this leads to higher costs, consumers pay higher prices and consume less in  $SpB$  than in  $SpA$ . Therefore,  $A$ 's dominance lowers consumer welfare. We investigate the consumer welfare issue in more detail in the next section.

### 3. Strategic Assortment Reduction and Consumer Welfare

In this section we ask whether strategic assortment reduction, as a consequence of retail dominance in the channel, increases or decreases the welfare of consumers. Consumers benefit when more products are available through more channels but must pay the portion of assortment costs passed through retail prices. In the asymmetric cost case of §2.3, this trade-off was clear because strategic assortment reduction resulted in higher costs without changing the number of distribution channels. However, as we saw in §2.2, strategic assortment reduction reduces the number of distribution channels of product 2 while simultaneously lowering costs. Thus, understanding the consumer welfare trade-off in the symmetric case requires additional analysis.

To investigate the impact of strategic assortment reduction on consumer welfare, we determine the outcome that maximizes consumer surplus, which is computed as follows. For a given outcome  $x \in \{F, Sp, Ex\}$ , denote total output for product  $i$  as  $q_i(x) = q_i^A + q_i^B$ ,  $i = 1, 2$  where  $q_i^j$  are the individual quantities listed in Table 2 from Proposition 1 under the corresponding outcome. Then consumer surplus under outcome  $x$  is

$$CS_x = \sum_{i=1,2} \int_0^{q_i(x)} [p_i(q) - p_i(q_i(x))] dq = \sum_{i=1,2} \frac{b_i}{2} [q_i(x)]^2, \quad (7)$$

which is the area between the demand curve Equation (1) and the price. As the right-hand side expression in Equation (7) indicates, consumer surplus depends crucially on the output  $q_i$  of the two varieties. The level of output of each product, in turn, depends on the number of retail outlets through which the products are distributed. This suggests that full distribution,  $F$ , has the most quantity, followed by the specialty distribution,  $Sp$ , and finally exclusive territories,  $Ex$ . However, as retailers take on a second product, assortment costs raise retail costs and lower output. The following proposition confirms that the former effect dominates in region  $\Theta$ .

**PROPOSITION 4.** *For  $(b_1/b_2, c/a)$  in  $\Theta$ , consumer surplus is maximized with the outcome  $F$  and minimized with the outcome  $Ex$ . Specifically,  $CS_F > CS_{Sp} > CS_{Ex}$ .*

The implication of this proposition is that any strategic assortment reduction induced by  $A$ 's dominance lowers consumer surplus. In fact, under the conditions leading to outcome  $Ex$  in equilibrium of the  $A$ -Dominant game, consumer surplus is *minimized*.

This result relates to the usual inefficiencies associated with monopoly power. Specifically, when retailer  $A$  decides to abandon product 2, she evaluates the added margin on *all* units of product 1 sold versus the potential lost profit from the sale of product 2. What she does not internalize, however, is the additional social costs in the form of monopoly inefficiencies incurred by consumers of product 2. Consequently, when  $A$  implements  $Sp$  or  $Ex$ , it adversely affects consumer surplus relative to  $F$ .

The adverse affect that comes with this strategic assortment reduction is partially counterveiled by the fact that  $A$ 's costs are lower in  $Sp$  leading to higher output (lower prices) for product 1 than in  $F$ . In fact, from Proposition 1, we note that total output of the popular variety increases going from  $F$  to  $Sp$ ,

$$q_1(Sp) = \frac{a-c/2}{3b_1} > \frac{a-c}{3b_1} = q_1(F).$$

This directly implies that consumers of the popular variety, product 1, benefit from strategic assortment reduction. Proposition 4, however, shows that this benefit is overshadowed by the loss in consumer surplus because of lower output in the specialty variety, product 2.

When  $b_1/b_2$  becomes larger (crossing over indifference curve  $h$  in Figure 3), this adverse effect on consumer surplus is doubled. In this case, the manufacturer, when evaluating the distribution through retailer  $B$ , makes the same assessment as  $A$  above and abandons one of the products to lower assortment costs. Because the profitability of each product is relatively similar when  $b_1/b_2$  is large, the channel, and in particular, the manufacturer, is better off distributing only product 2 to retailer  $B$ .

## 4. Conclusion and Managerial Implications

This paper has examined whether a retailer has strategic incentives that deviate from a manufacturer's with respect to assortment. We have illustrated that a retailer may be quicker to abandon a manufacturer's specialty variety when there are increasing costs associated with the number of SKUs. In a competitive retail setting, a first-moving retailer can remove a specialty variety from its assortment while anticipating that a rival retailer will want to carry it in spite of the additional costs. For managers this has several implications, which are discussed in our analysis.

First, the ability of one retailer to commit to its assortment decision before other channel members may have great impact on distributional outcomes. By refusing to carry a manufacturer's specialty variety, the dominant retailer can lower its own costs while simultaneously inducing the competing retailer to carry the manufacturer's full product line. The competing retailer bears the higher assortment costs thereby giving the dominant retailer a cost advantage. For manufacturers, this means additional channel coordination problems as a result of reduced competition for the specialty product.

Second, a dominant retailer may have a profit incentive to refuse to distribute specialty varieties that extend beyond its own operational costs. By not distributing the specialty product, the dominant retailer can pass on the assortment costs to the competing retailer. Because of these higher costs, the rival retailer's consumer price is higher. As a result, the dominant retailer benefits from relaxed price competition for the commonly carried popular product.

Third, under conditions supporting a strategic assortment reduction, consumer welfare is negatively affected. Consumers of the popular product may get lower prices, but lower competition for the specialty product leads to monopoly inefficiencies as well as more severe losses to double marginalization. Thus, the growth of the discount retail format is not always in the consumer's best interest.

Fourth, strategic assortment reduction outcomes reflect retail segmentation in the form of a discounter—the dominant, low-cost retailer—and a specialty shop—the high-cost, wide-assortment retailer. Recognizing this segmentation may help manufacturers tailor other elements of the marketing mix as it applies to specific channels. For instance, manufacturers with wide product lines may want to focus training for sales staff at specialty shops to direct consumers to the product with the best-suited features.<sup>15</sup> Sales staff

<sup>15</sup> Gorman (2001) provides a recent illustration from the cookware category, in which manufacturers offer specialty retailers training that instructs floor personnel how to position and sell new products.

at the dominant retailer, on the other hand, need not receive such training.

In our analysis, we made several simplifying assumptions to assess the impact of retail dominance on assortment outcomes. We have not considered competitive effects between varieties. By introducing this dimension of competition, the dominant retailer would have an extra incentive to abandon the specialty variety to insulate its popular variety from this additional competitive pressure. This reasoning implies that intervariety competition tends to reinforce the motivation for strategic assortment reduction.

We have also not explored a deeper relationship between the relative price sensitivities of the two product varieties and strategic assortment reduction. It may be interesting to consider the outcomes if the specialty variety is characterized not only by a lower volume, but also by lower price sensitivity relative to the popular variety.

The manufacturer may also have strategic variables other than wholesale prices at its disposal; We have not modeled this here. Advertising and other promotional activity by the manufacturer are bound to be altered as a result of the shift in channel power and this may change the distributional incentives discussed in our model. In addition, relaxing the restriction that wholesale prices are uniform and allowing more complicated wholesale pricing contracts will clearly improve the ability to extract retailer surpluses and align assortment incentives within the channel.

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## References

- Allain, M., P. Waelbroeck. 2006. Music variety and retail concentration. Working paper, ENST, Paris.
- Baumol, W., E. Ide. 1956. Variety in retailing. *Management Sci.* 3(1) 93–101.
- Bhatnagar, A., B. Ratchford. 2004. A model of retail format competition for non-durable goods. *Internat. J. Res. Marketing* 21(1) 39–59.
- Bianco, A., W. Zellner, B. Diane, M. France, T. Lowry, N. Byrnes, S. Zegel, M. Arndt, R. Berner, A. Therese. 2003. Is Wal-Mart too powerful? *Bus. Week* (October 6) 100–110.
- Bloom, P. M., G. T. Gundlach, J. P. Cannon. 2000. Slotting allowances and fees: Schools of thought and the views of practicing managers. *J. Marketing* 64(2) 92–108.
- Boatwright, P., J. Nunes. 2001. Reducing assortment: An attribute-based approach. *J. Marketing* 65(3) 50–63.
- Borle, S., P. Boatwright, J. Kadane, J. Nunes, G. Shmeuli. 2005. The effect of product assortment changes on customer retention. *Marketing Sci.* 24(4) 616–622.
- Briesch, R., P. Chintagunta, E. Fox. 2009. How does assortment affect grocery store choice? *J. Marketing Res.* Forthcoming.
- Broniarczyk, S., W. Hoyer, L. McAlister. 1998. Consumers' perceptions of the assortment offered in a grocery category: The impact of item reduction. *J. Marketing Res.* 35(2) 166–176.
- Cachon, G. P., A. G. Kök. 2007. Category management and coordination in retail assortment planning in the presence of basket shopping consumers. *Management Sci.* 53(6) 934–951.
- Desjardins, D. 2005. Retail competition maturing fast. *DSN Retailing Today* 44(10) 13.
- Discount Store News. 1999. Auto chain consolidation limits mass to accessories. (August 9) 86.
- Drèze, X., S. Hoch, M. Purk. 1994. Shelf management and space elasticity. *J. Retailing* 70(4) 301–326.
- Dukes, A., E. Gal-Or, K. Srinivasan. 2006. Channel bargaining with retailer asymmetry. *J. Marketing Res.* 43(1) 84–97.
- Fishman, C. 2006. *The Wal-Mart Effect: How the World's Most Powerful Company Really Works—And How It's Transforming the American Economy*. Penguin, New York.
- Geylani, T., A. Dukes, K. Srinivasan. 2007. Strategic manufacturer response to a dominant retailer. *Marketing Sci.* 26(2) 164–178.
- Gorman, L. 2001. Defining your cookware niche. *Gourmet Retailer* 22(5) 126–130.
- Gourville, J. T., D. Soman. 2005. Overchoice and assortment type: When and why variety backfires. *Marketing Sci.* 24(3) 382–395.
- Hoch, S., E. Bradlow, B. Wansink. 1999. The variety of an assortment. *Marketing Sci.* 18(4) 527–546.
- Inderst, R., G. Shaffer. 2007. Retail mergers, buyer power, and product variety. *Econom. J.* 117(516) 45–67.
- Iyer, G., J. M. Villas-Boas. 2003. A bargaining theory of distribution channels. *J. Marketing Res.* 40(4) 80–100.
- Kadiyali, V., P. Chintagunta, N. Vilcassim. 2000. Manufacturer-retailer channel interactions and implications for channel power: An empirical investigation of pricing in a local market. *Marketing Sci.* 19(2) 127–148.
- Krishnan, T., K. Koelmeijer, R. Rao. 2002. Consistent assortment provision and service provision in a retail environment. *Marketing Sci.* 21(1) 54–73.
- Kumar, N., R. Rao. 2006. Using basket composition data for intelligent supermarket pricing. *Marketing Sci.* 25(2) 188–199.
- Luo, L., P. Kannan, B. Ratchford. 2007. New product development under channel acceptance. *Marketing Sci.* 26(2) 149–163.
- Master, G. 2001. High tech appeal. *Retail Merchandiser* 41(8) 36.
- Messinger, P., C. Narasimhan. 1997. A model of retail formats based on consumers' economizing on shopping time. *Marketing Sci.* 16(1) 1–23.
- Munson, C. L., M. J. Rosenblatt, Z. Rosenblatt. 1999. The use and abuse of power in supply chains. *Bus. Horizons* 42(1) 55–66.
- Nilsson, J., V. Høst. 1987. *Research in Marketing: Supplement 3—Reseller Assortment Decision Criteria*. JAI Press, Greenwich, CT.
- O'Keefe, B. 2002. Meet your new neighborhood grocer. *Fortune* 145(10) 93–96.
- Public Broadcasting Service. 2007. The way the music died: The industry's perfect storm. <http://www.pbs.org/wgbh/pages/frontline/shows/music/perfect/walmart.html>.
- Raju, J., Z. J. Zhang. 2005. Channel coordination in the presence of a dominant retailer. *Marketing Sci.* 24(2) 254–262.
- Rigby, D. K., D. Haas. 2004. A survey of ideas, trends, people, and practices on the business horizon. *Harvard Bus. Rev.* 82(12) 22–26.
- Schiller, Z., W. Zellner, R. Stoghill, II, M. Maremont. 1992. Clout! More and more, retail giants rule the marketplace. *Bus. Week* (December 21) 66–73.
- Zhu, T., V. Singh, A. Dukes. 2008. Local competition, entry, and agglomeration. Working paper, University of Chicago, Chicago.