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The Economics of Slotting Contracts

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Abstract

Slotting fees, per-unit-time payments made by manufacturers to retailers for shelf space, have become increasingly prevalent in grocery retailing. Shelf space contracts are shown to be a consequence of the normal competitive process when retailer shelf space is promotional, in the sense that the shelf space induces profitable incremental individual manufacturer sales without drawing customers from competing stores. In these circumstances, retailer and manufacturer incentives do not coincide with regard to the provision of promotional shelf space, and manufacturers must enter shelf space contracts with retailers. Retailers are compensated for supplying promotional shelf space at least partially with a per-unit-time slotting fee when interretailer price competition on the particular product makes compensation with a lower wholesale price a more costly way to generate equilibrium retailer shelf space rents. Our theory implies that slotting will be positively related to manufacturer incremental profit margins, a fact that explains both the growth and the incidence across products of slotting contracts in grocery retailing.

1. Introduction

Slotting arrangements, the payment by manufacturers for retail shelf space, have become increasingly important in the supermarket industry. Since the early 1980s, slotting fees for both new and established supermarket products have grown both in size and with respect to the number of products covered (FTC 2001b, pp. 4, 11, 11 n. 18, 12 n. 19).[1] Similar arrangements are now also common

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[1] Slotting fees on established supermarket products are often referred to as "pay-to-stay" fees and are frequently used for tortilla, produce, and frozen food products (FTC 2001b, p. 29 n. 94) as well as for snack foods, spices, light bulbs, greeting cards, and products placed in racks near the checkout cashiers (FTC 2003, pp. 19 n. 92, 57).

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in other retail sectors, such as drugstores, bookstores, and record stores (see Rosenthal 1991; Surowiecki 2004; *Wall Street Journal* 2002). In addition to payments made for stocking a product, slotting payments may be made for special displays or preferred locations, such as end-of-aisle displays in supermarkets, the placement of books on tables in bookstores, and the promotion of particular records at listening posts in record stores. These arrangements have been the subject of recent antitrust litigation,[2] and supermarket slotting arrangements, in particular, have been the focus of recent congressional hearings (U.S. House 1999; U.S. Senate 1999, 2000) and Federal Trade Commission studies (FTC 2001b, 2003).

The primary competitive concern with slotting arrangements is the claim that they may be used by manufacturers to foreclose or otherwise disadvantage rivals, raising the costs of entry and consequently increasing prices (FTC 2001b, pp. 34–41). It is now well established in both economics and antitrust law that the possibility of this type of anticompetitive effect depends on whether a dominant manufacturer can control a sufficient amount of distribution so that rivals are effectively prevented from reaching minimum efficient scale.[3]

Slotting contracts, however, very often exist in circumstances in which the required conditions for an anticompetitive effect are unlikely to exist. In particular, slotting contracts are frequently used by manufacturers with relatively small market shares and cover relatively small shares of total retail distribution. Furthermore, while some slotting contracts bind retailers to stocking only or primarily a particular manufacturer's product, many slotting contracts merely require a retailer to stock or dedicate a particular amount of display space or shelf location to the manufacturer's product without any exclusivity requirement.[4]

[2] See, for example, *Coca-Cola Co. v. Harmar Bottling Co.*, 50 Tex. Sup. Ct. J. (October 20, 2006; No. 03-0737), rev'g, 111 S. W. 3d 287 (Tex. App.-Texarkana, 2003); *El Aquila Food Products v. Gruma Corp.,* 301 F. Supp. 2d 612 (S.D. Tex. 2003), aff'd, 131 Fed. Appx. 450 (5th Cir. 2005); *R. J. Reynolds Tobacco Co. v. Philip Morris, Inc.,* 199 F. Supp. 2d 363 (M.D.N.C. 2002), aff'd per curiam, 67 Fed. Appx. 810 (4th Cir. 2003); *Conwood Co. v. United States Tobacco Co.,* 290 F. 3d 768 (6th Cir. 2002); *American Booksellers Ass'n, Inc. v. Barnes and Noble, Inc.,* 135 F. Supp. 2d 1031 (N.D. Cal. 2001); *Intimate Bookshop, Inc. v. Barnes and Noble, Inc.,* 88 F. Supp. 2d 133 (S.D.N.Y. 2000); *FTC v. McCormick* (FTC Dkt. No. C-3939 [2000]).

[3] For a summary of the economic conditions under which distribution contracts may cause anticompetitive effects, see, for example, Klein (2003). Jacobson (2002, p. 324) summarizes current antitrust law with regard to foreclosure as "routinely sustain[ing] the legality of exclusive dealing arrangements with foreclosure percentages of 40 percent or less" (Jacobson [2002] cites cases at p. 324 n. 85). Courts sometimes use a space-to-sales ratio as a necessary condition for foreclosure in shelf space cases, where a dominant manufacturer may foreclose competitors only if it enters shelf space contracts that exceed its market share. For example, the court rejected the antitrust challenge to Philip Morris's Retail Leaders program, in which retailers were compensated for supplying advantageous display space to Philip Morris cigarette brands, in part by finding that the share of retailer shelf space contracted for by Philip Morris was less than its market share of sales (*R. J. Reynolds Tobacco Co. v. Philip Morris Inc.,* 199 F. Supp. 2d 362, at 388, 390 [M.D.N.C. 2002], aff'd per curiam, 67 Fed. Appx. 810 [4th Cir. 2003]).

[4] For example, FTC (2003, p. 57) reports that exclusivity was not a prevalent practice in the slotting contracts used in five product categories studied (fresh bread, hot dogs, ice cream, shelf-stable pasta,

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Another factor that argues against an anticompetitive effect is that most slotting arrangements involve relatively short-term retailer shelf space commitments. For example, current grocery slotting stocking commitments usually bind a supermarket to provide shelf placement for a period of 6 months to 1 year.[5] The relatively short duration of most slotting contracts means that, even if slotting contracts covered a large share of retailer shelf space, it is unlikely the contracts could be used to foreclose competing manufacturers. As the contracts expire over time, competitors could openly compete for distribution and sign agreements with retailers.[6] Moreover, unless there are substantial economies of scale in manufacturing (a rare condition for most grocery products), new manufacturer entrants do not have to operate at a significant cost disadvantage during the period before a sufficient number of retail distribution contracts expire and shelf space becomes available.

What remains is the claim that slotting arrangements make it more difficult for rivals to compete because shelf space payments raise the cost of obtaining retail distribution. However, slotting fees are a payment that must be borne by all manufacturers. Competition for shelf space that leads to slotting may raise the cost of obtaining retail distribution, but it does so for everyone. An artificial barrier to entry is created only if one assumes that the increased cost necessary

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and shelf-stable salad dressing). However, recent antitrust challenges to slotting arrangements have generally involved some form of exclusivity. For example, of the antitrust slotting cases cited in note 2, the shelf space arrangements used by Gruma, United States Tobacco, and McCormick involved limited exclusivity, and the arrangements used by Coca-Cola and Philip Morris involved limited exclusivity with respect to promotional displays. Only the bookseller cases, which involved publisher wholesale price discounts as payment for the purchase of retailer shelf (and valuable table) space can be said not to include any element of exclusivity. Klein and Murphy (forthcoming) provide a procompetitive explanation for exclusive shelf space arrangements that are based on retailer offers of exclusive shelf space in a product category as a mechanism to increase manufacturer competition for shelf space. Retailers, effectively acting as bargaining agents for their customers, use exclusive dealing as a way to commit to deliver all their loyal customers to a chosen manufacturer, thereby increasing the ex ante elasticity of demand faced by each manufacturer competing for retailer shelf space compared with the ex post demand elasticity each manufacturer would face if multiple products were stocked.

[5] Interviews with manufacturers and retailers indicate that the most common time period for a commitment to stock a new product is a minimum of 6 months (FTC 2003, p. iii n. 14; see also FTC 2001a, pp. 83–84 [Sussman]). Slotting contracts that deal with stocking commitments for established products are usually 1 year in duration (FTC 2003, p. 19). Other shelving commitments, for example, the display of a particular product at the end of an aisle, may be of substantially shorter term. For example, end-of-aisle displays in the salty snack food category are likely to rotate weekly. See the description of Frito-Lay's marketing practices in U.S. Department of Justice (1996).

[6] Several courts have established a safe harbor for exclusive agreements that are of short duration and may be terminated on short notice. See, for example, *Roland Mach. Co. v. Dresser Industries* (49 F.2d 380, 395 [7th Cir. 1984]), which held that exclusive dealing contracts terminable in less than 1 year are presumptively lawful under section 3 of the Clayton Act; *Omega Environmental, Inc. v. Gilbarco, Inc.* (127 F.3d 1157, 1162 [9th Cir. 1997]), which cited *Roland Machinery* and stated that the "short duration and easy terminability of these agreements negates substantially their potential to foreclose competition" (cert. denied, 525 U.S. 812 [1998]); and *R. J. Reynolds Tobacco Co. v. Philip Morris* (199 F. Supp. 2d 362, 391), in which the court concluded that because Philip Morris agreements with retailers were terminable at will with 30 days' notice, "retail product and display space are subject to uninterrupted competitive bidding, and Plaintiffs are not substantially foreclosed from the relevant market."

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to distribute a product imposes a higher cost on new entrants relative to incumbents, for example, because of imperfections in the capital market.[7] However, competition between incumbents and entrants for retail distribution generally occurs on a level playing field in the sense that all manufacturers can openly compete for shelf space and it is the manufacturer willing to pay the most for a particular space that obtains it.

Anticompetitive theories of rival manufacturer foreclosure do not provide us with an explanation for why the competitive process would have changed in the early 1980s, when supermarket slotting contracts became more prevalent and began to grow rapidly (FTC 2001b, pp. 4, 11, 11 n. 18, 12 n. 19)[8] or why some large retailers, such as Wal-Mart, do not accept slotting fees (Kelly 1991; *Consumer Reports* 2000; FTC 2001b, p. 18). However, we must be clear in what we mean by a slotting contract when describing this time-series and cross-section variation in the incidence of slotting.

Payments by suppliers for promotional retail shelf space, including product displays and in-store advertisements, have existed since at least the 1950s (see, for example, 267 F.2d 439 [3rd Cir. 1959], the "Chain Lightning" Robinson-Patman cases). These early arrangements, however, are not considered slotting because they did not involve primarily a per-unit-time payment for retail shelf space. Manufacturer contracts for prominent shelf space, such as end-of-aisle displays, are more generally referred to as trade promotions, with retailer compensation in such contracts taking many forms in addition to upfront cash, including wholesale price discounts and other variable payments.[9] While a trade promotion consisting of a reduced wholesale price in return for preferential retail shelf space is analytically similar to slotting in the fundamental economic sense that the manufacturer is offering special terms contingent on retailer supply of shelf space, a trade promotion is not commonly referred to as slotting unless retailer compensation for shelf space includes a significant upfront or per-unit-time payment. When commentators describe the growth of slotting arrangements since the early 1980s, they are referring to the growth in per-unit-time shelf space compensation.

Recognizing that slotting involves per-unit-time compensation for shelf space also clarifies the claim that Wal-Mart does not accept slotting fees. Wal-Mart contracts with suppliers over shelf space, including the provision of particularly

[7] Bloom, Gundlach, and Cannon (2000) argue that smaller manufacturers are unable to meet the shelf space offers of larger manufacturers because they do not have access to sufficient capital. This argument regarding an imperfect capital market is formalized by Shaffer (2005).

[8] Sullivan (1997) states that systematic per-unit-time slotting fees did not exist prior to 1984 (citing *Supermarket News* 1984).

[9] Trade promotions may include wholesale price quantity discounts, cash rebates, coupons, consignment programs, co-op advertising reimbursement, display allowances, off-invoice allowances, bill-back allowances, promotional allowances, free goods, and performance funds, in addition to upfront slotting fees (Kotler 2003, pp. 489–90; Winer 2007, p. 305). Recent surveys suggest that total trade promotion spending, including slotting, constituted 13–17 percent of manufacturer gross dollar sales in 2001 (ACNielsen 2003; Cannondale Associates 2003).

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desirable promotional shelf space. But because Wal-Mart is compensated for shelf space primarily with lower wholesale prices, the arrangements are not considered slotting contracts.[10]

The competitive economic forces that lead transactors to adopt slotting contracts are analyzed in two steps. First, in Section 2 we ask the fundamental economic question why manufacturers and retailers often find it necessary to enter into contracts for retail shelf space. It would appear that manufacturers could merely set wholesale prices for their products and let retailers, certainly retailers operating in the highly competitive supermarket environment, independently choose which products to stock and prominently display. It is not obvious why it is necessary for the manufacturer and retailer to enter a contract in which the manufacturer purchases retail shelf space (with a wholesale price discount, a per-unit-time payment, or some other form of compensation) contingent on the retailer's stocking or prominently displaying the manufacturer's product. We answer this question by recognizing that these contracts deal with retailer supply of promotional shelf space and that retailers have an insufficient independent incentive to supply the quantity of promotional shelf space that maximizes individual manufacturer profitability.

Retailers do not have the desired incentive to provide promotional shelf space to a particular individual manufacturer because the manufacturer's profitability from the incremental sales induced by promotional shelf space is significantly greater than the retailer's profitability. This is because the manufacturer's profit margin on incremental sales is generally significantly greater than the retailer's profit margin and because the retailer's quantity increase is not significantly greater than the manufacturer's quantity increase. Promotional shelf space placement induces some of the retailer's consumers to purchase the displayed product who would not otherwise do so but does not increase the retailer's overall sales by inducing consumers of other retailers to shift their purchases to the retailer. In fact, the retailer's total quantity increase may be significantly less than the individual manufacturer's quantity increase if the promotional shelf space primarily shifts the retailer's consumer purchases to the promoted brand from other brands. Because there are no interretailer competitive effects from retailer supply of promotional shelf space and because there are likely to be intermanufacturer "cannibalization" effects, retailers do not have the incentive to provide the joint-profit-maximizing quantity of promotional shelf space for a particular manufacturer's product. This leads manufacturers to compete for and contract with retailers for promotional space.

[10] Wal-Mart usually insists on receiving the single best wholesale price that suppliers can offer in lieu of slotting fees. For example, Wal-Mart chairman S. Robson Walton describes Wal-Mart's policy as "encourag[ing] suppliers to quote us net-net prices. . . . We don't charge slotting fees, and we don't take special deal money, reimbursements to cover double-coupon expenses, and so on" (Walton 2005). Similarly, a Costco representative testified that "what we do is say, 'are you paying other discounts or what is your menu of discounts,' and if slotting is on there, we want to get the same bottom line. . . . Whether they call it a slotting allowance or advertising allowance or promotional allowance doesn't make a lot of difference" (FTC 2001a, p. 61 [Sussman]).

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Given that manufacturers and retailers enter shelf space contracts, in Section 3 we then undertake the second step of the analysis by examining why retailer compensation for promotional shelf space may involve a per-unit-time slotting fee. Some economists believe that per-unit-time compensation for promotional shelf space is demanded by retailers because it leads to supracompetitive retailer profits and higher consumer prices. This claim is inconsistent with the intensive competition that exists in supermarket retailing and the fact that supermarket profitability has not increased over time as slotting has become more prevalent. Instead, per-unit-time slotting fees are shown to be an efficient form of compensation for promotional shelf space when interretailer price competition on the particular contracted-for product would pass on a large fraction of a wholesale price decrease in a lower retail product price. Under these circumstances, compensation with a lower wholesale price requires a larger wholesale price decrease to generate the necessary equilibrium retailer return on its promotional shelf space and thereby increases the manufacturer's cost of purchasing such shelf space.

In Section 4 we demonstrate that our promotional theory of slotting is consistent with both the time-series and cross-section evidence regarding the growth and incidence of slotting. Our theory implies that the economic incentive for manufacturers to contract with retailers for promotional shelf space is related to the quantity of sales that can be induced by promotional shelf space and the manufacturer profit margin on those incremental sales. The increasing number of new products and the higher manufacturer margin on supermarket products explains the increasing demand for (and value of) promotional shelf space and why slotting contracts have become more prevalent since the early 1980s. Incremental manufacturer profit margins also accurately predict which supermarket products are likely to use slotting contracts.

2. A Promotional Services Theory of Retailer Shelf Space Contracts

2.1. The Promotional Nature of Retailer Shelf Space

Retailer shelf space is a form of promotion in the sense that a displayed product induces additional sales. In contrast to abstract economic models, in which consumers are assumed to know the products they want before they enter a store and the sole function of retailing is to reduce shopping costs by providing consumers with their desired products, retailers in the real world have the ability to influence consumer purchases with their stocking and display decisions.[11]

Promotional shelf space provided by retailers can be thought of as inducing incremental impulse sales of a manufacturer's product by raising the reservation values placed on the product by a subgroup of marginal consumers who, absent

[11] Many marketing studies have concluded that shelf space positioning increases sales of the featured product. See Rennhoff (2004a), Dreze, Hoch, and Purk (1994), and Areni, Duhan, and Kiecker (1999).

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the promotion, would not otherwise purchase the product. The product may be a known brand that is normally stocked by the retailer, but once the product is more prominently displayed on the retailer's shelves (say, in eye-level shelf space, end-of-aisle displays, or near the checkout registers), marginal consumers' reservation values increase so that they are equal to or greater than the retail price, and they decide to purchase the product. Alternatively, the product may not be generally known and stocked, but once the retailer devotes some shelf space to the product, some marginal consumers who see it will similarly decide to purchase. The economic essence of promotion, therefore, can be thought of as involving the provision of retailer services (promotional shelf space) as a way to provide a targeted effective price discount to marginal consumers.[12] Hence, for this effect to operate, promotional shelf space, like other forms of promotional services, must be provided to consumers free of charge.[13]

Since retailer shelf space is a form of promotion that consumers are not willing to pay for but that induces incremental sales that are profitable to the manufacturer, manufacturers will want greater retailer promotional shelf space supplied for their products than retailers would choose to supply on their own. Retailers deciding how much promotional shelf space to provide for a manufacturer's product will not take account of the manufacturer's profit margin on the incremental sales produced by the promotional shelf space. This problem is particularly significant when the manufacturer is supplying a differentiated product, for which the wholesale price the manufacturer is receiving is substantially greater than its marginal production cost. In such circumstances, incremental sales may be highly profitable to the manufacturer, yet retailers will not find it in their interests to supply the promotional shelf space necessary to generate the man-

[12] An obvious question is whether supplying an effective price discount to marginal consumers in this way increases the actual market price. Since inframarginal consumers, who would purchase the product without retailer provision of promotional shelf space, are unlikely to receive any value from the shelf space, the provision of promotional shelf space can be thought of as shifting demand out only for marginal consumers, and by increasing the marginal elasticity of demand, this results in a decrease in the manufacturer's profit-maximizing price. More generally, promotion can produce some value for inframarginal consumers, and thereby the shift in demand may result in an increase or decrease in the market price. When the market price increases, the net price, that is, the market price minus the value of the promotional services, will decrease for marginal consumers but possibly increase for some inframarginal consumers. See Becker and Murphy (1993).

[13] This view of retailer-supplied point-of-sale promotional services as an effective price discount should be contrasted with the retailer services postulated in the classic interretailer free-riding analysis popularized by Telser (1960), in which consumers are implicitly assumed to value retailer-supplied services (for example, product demonstrations) by an amount equal to or greater than the costs of supply and, therefore, would be willing to pay separately for the services. In the Telser analysis, consumers do not pay for the services because they can free ride by obtaining services free of charge from a full-service retailer before purchasing the product from a low-service discount retailer. However, this free-riding analysis is incomplete as it stands because it does not explain why full-service retailers provide valuable services free of charge, thereby creating a free-riding problem, rather than separately charge for the services. In most cases, full-service retailers do not charge separately for services because the services are promotional services aimed primarily at consumers who would not be willing to pay for them. Manufacturers, therefore, implicitly contract with their retailers and compensate them (for example, by the use of minimum resale price maintenance) for providing such retailer promotional services free of charge. See Klein and Murphy (1988).

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ufacturer's profitable incremental sales. Manufacturers, therefore, must find a way to incentivize retailers to supply the desired promotional shelf space for their products.[14]

Retailers also do not take account of manufacturer profit on incremental sales when they decide to engage in price competition. However, in contrast to retailer decisions with regard to the supply of promotional shelf space, incentivizing retailers to engage in price competition generally is not a problem. This is because a lower retail price has large interretailer demand effects, increasing the individual retailer's demand much more than it increases the manufacturer's demand as consumers respond to a lower retail price by switching their purchases of the manufacturer's product to the lower priced retailer. These interretailer demand effects offset the fact that the manufacturer's margin on incremental sales is substantially greater than the retailer's margin so that any distortion with regard to individual retailer incentives to engage in price competition is largely eliminated. In contrast, retailer supply of promotional shelf space does not produce significant interretailer effects.

2.2. A Model of Retailer Price and Promotional Competition

We can elucidate the difference between the individual retailer incentive to engage in price competition compared with providing promotional shelf space with the following model.[15] Assume that manufacturers supply products that are

[14] This problem of insufficient retailer supply of promotional services was first presented by Klein and Murphy (1988), in which vertical restraints such as exclusive territories or resale price maintenance are used to facilitate a self-enforcement mechanism by creating a retailer profit premium for retailers supplying the promotional services desired by the manufacturer, with manufacturers monitoring and terminating retailers that do not perform as desired. In contrast to Klein and Murphy, assuring retailer performance of shelf space contracts usually does not require a significant retailer profit premium above the opportunity cost of shelf space because it is easy for manufacturers to detect retailer nonperformance compared with the more difficult to detect retailer nonperformance of point-of-sale promotional sales efforts contracted for by manufacturers in many of the distribution contractual arrangements that employ vertical restraints.

[15] This analysis is related to the model presented by Winter (1993), which makes the fundamental economic distinction between interretailer and intermanufacturer effects of retailer competitive behavior. Winter uses the primary insight of the Klein and Murphy (1988) model that there are heterogeneous consumers and that the manufacturer wishes retailers to provide a group of marginal consumers with an effective price discount in the form of free retailer-supplied promotional services. However, in contrast to Klein and Murphy, in which vertical restraints are used to create a retailer premium within a manufacturer monitoring and self-enforcement framework, the Winter model uses vertical restraints to create direct retailer incentives to supply desired promotional services without any manufacturer monitoring of retailer performance. In particular, Winter's solution involves the manufacturer's creation of optimal retailer incentives by the use of vertical restraints that share the manufacturer's profit margin with retailers. For example, if the total profit margin on incremental sales is shared equally between the manufacturer and retailer, say, by the grant to retailers of exclusive territories, that is, the setting of maximum retail price maintenance at the joint-profit-maximizing level and the appropriate lowering of the wholesale price, then the incentives of the retailer and manufacturer to engage in nonprice promotion are equalized, in spite of the fact that retailer promotion has primarily intermanufacturer effects with little or no interretailer effects. However, unmonitored retailers will engage in the nonprice competition that has the greatest interretailer effects, which will not involve the supply of promotional shelf space or other retailer promotional services desired by the manufacturer. Moreover, even assuming that unmonitored retailers will engage

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sold to retailers at a wholesale price P_W and that retailers then sell the product to consumers at a retail price P_R. Further assume that manufacturers face negatively sloped demands for their products and, therefore, sell their products at wholesale prices above marginal manufacturing cost MC_M, in some cases significantly above marginal cost. This does not mean that manufacturers are earning monopoly rents or possess antitrust market power. Almost every firm operating in the economy, except perhaps the wheat farmer described in introductory economics textbooks, faces a negatively sloped demand because it is supplying a somewhat unique product. Therefore, almost every manufacturer charges a price greater than marginal cost and has the potential to earn significant profit on incremental sales (see Klein 1993).

In contrast, retailers are assumed to face much more highly price elastic demands for the product than the manufacturer of the product. Retailers compete in terms of the prices they charge and the level of services they provide, with consumers shopping at the retailer where their surplus is perceived to be highest. However, although individual retailers are assumed to face highly elastic demands, individual retailer demand is less than perfectly elastic because retailers may possess unique specific factors, such as a particular locational advantage or a reputation for supplying preferred service.[16]

The fact that the retailer price elasticity of demand is greater than the manufacturer price elasticity of demand results in an equilibrium differential between manufacturer and retailer profit margins such that the manufacturer and perceived retailer return from lowering the price will be the same. To illustrate, assume that a retailer's marginal cost of selling an additional unit of a product to consumers, MC_R, is equal to the wholesale price charged by the manufacturer, P_W, plus the retailer's marginal cost of selling the product, MC_S, which includes the retailer's costs of providing shelf space:

$$MC_R = P_W + MC_S. \tag{1}$$

Each retailer will set its retail price P_R and sell q_R units based on MC_R and its price elasticity of demand, η_{q_R,P_R}:

$$\frac{P_R - MC_R}{P_R} = -\frac{1}{\eta_{q_R,P_R}}. \tag{2}$$

in the nonprice competition desired by the manufacturer, Winter's vertical restraint solution equalizes the manufacturer and retailer incentives to promote but leaves both incentives at less than the joint-profit-maximizing incentive to promote.

[16] When a retailer, such as a supermarket, is a multiproduct seller, individual product retailer price elasticities of demand may not be greater than the manufacturer's price elasticity of demand. Individual retailer demand will depend on the overall average price charged for the bundle of goods, which will not change much when an individual product price changes. Therefore, while an individual retailer's reduction in the price of a particular product may lead some of its customers to switch from purchasing rival brands to the now lower priced brand, there may not be significant interretailer demand effects. In these circumstances, the following analysis would have to be modified, and retailer price competition on individual products may be inadequate from the manufacturer's point of view.

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Summed across n assumed identical retailers, each facing the same elasticity of demand and each selling q_R units, the total quantity sold by all retailers, Q_R, is equal to nq_R, and the perceived elasticity of demand at the retail level of the market, η_{Q_R,P_R}, equals η_{q_R,P_R}. Hence, equation (2) can be rewritten in terms of quantities sold in the market by all retailers as

$$\frac{P_R - MC_R}{P_R} = -\frac{1}{\eta_{Q_R,P_R}}. \tag{3}$$

Similarly, profit maximization implies that the manufacturer will set the wholesale price on the basis of its marginal cost of production, MC_M, and its price elasticity of demand, η_{Q_M,P_W}:

$$\frac{P_W - MC_M}{P_W} = -\frac{1}{\eta_{Q_M,P_W}}. \tag{4}$$

Since the quantity of the product sold by the manufacturer, Q_M, is exactly equal to the total quantity sold by all retailers, Q_R, equations (3) and (4) imply

$$\frac{\partial Q_R}{\partial P_R}(P_R - MC_R) = \frac{\partial Q_M}{\partial P_W}(P_W - MC_M). \tag{5}$$

That is, the perceived return to retailers from lowering the price, the left-hand side of equation (5), is approximately equal to the manufacturer's return from such a price reduction, the right-hand side of equation (5).

Although the manufacturer margin, $(P_W - MC_M)$, is substantially greater than the retailer margin, $(P_R - MC_R)$, in equilibrium, retailer demand responses to price changes, $\partial Q_R/\partial P_R$, will be proportionately greater than manufacturer demand responses to price changes, $\partial Q_M/\partial P_W$, to offset the higher manufacturer margin. This is because a retailer price decrease causes shifts in the manufacturer's sales between retailers that largely cancel out in terms of the manufacturer's net sales increase. In equilibrium, the manufacturer and retailer both adjust their prices so that their individual margins offset the increased retailer demand response relative to the manufacturer demand response.

For example, if the manufacturer's margin is, say, 20 times the retailer's margin in equilibrium, the retail response to a decrease in price in equilibrium, $\partial Q_R/\partial P_R$, will be approximately 20 times the manufacturer's response, $\partial Q_M/\partial P_W$. While the manufacturer considers only intermanufacturer demand effects in determining the profitability of a lower wholesale price, retailers also consider interretailer demand effects from lower retail prices. In fact, because of the relative magnitude of these two effects, retailers will focus almost exclusively on interretailer demand effects or how they can get an advantage over competing retailers. Although the retailer gets only about 1/20th of the total incremental profit from its reduction in price that increases total manufacturer sales, its demand response is 20 times larger. Therefore, competitive retailers

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earn the same profit as the manufacturer from lowering the price, which is approximately equal to the total joint profit. Consequently, although retailers do not take account of the manufacturer's much larger profit margin on incremental sales when lowering price, this does not cause a problem in terms of producing too little retailer price competition. The manufacturer can be assured that retail price competition will be approximately optimal.[17]

With this price competition benchmark in mind, now consider the difference when a retailer decides how much promotional service, S, it will supply for a particular manufacturer's product, where S is defined as the number of dollars the retailer spends on product promotion, such as the dollar value of promotional shelf space provided for the manufacturer's product. Although individual retailers operate in a highly competitive environment, they have the ability by allocating promotional shelf space to a particular branded product to induce sales of that product to marginal consumers. We assume for expositional simplicity that there are no interretailer effects from retailer supply of promotional shelf space.

The simplest case to consider is a retailer deciding which known brand in a particular product category to display more prominently than other brands, for example, which brand should receive the retailer's eye-level or end-cap shelf space. Since all brands demanded by consumers are assumed to be available in this case, there are unlikely to be any interretailer effects from the retailer's decision to supply promotional shelf space to any particular brand. We can reasonably assume that no consumer will switch to an alternative retailer merely because its desired brand is not prominently displayed. Because there are no interretailer effects from a retailer's decision to prominently display a particular brand, the retailer's sales increase of the brand will equal the manufacturer's sales increase:

$$\frac{\partial Q_R}{\partial S} = \frac{\partial Q_M}{\partial S}. \tag{6}$$

Therefore, because the manufacturer's profit margin on incremental sales is likely to be greater than the retailer's profit margin, the retailer's return to providing prominent shelf space for a manufacturer's product will be less than the manufacturer's return from the shelf space:

$$\frac{\partial Q_R}{\partial S}(P_R - \mathrm{MC}_R) < \frac{\partial Q_M}{\partial S}(P_W - \mathrm{MC}_M). \tag{7}$$

A similar analysis applies to the case of new, unknown products that are not demanded by consumers ex ante but that some consumers purchase once a

[17] It is only approximately optimal because the small margin earned by the retailer (5 percent in our example) implies that the manufacturer's profit from incremental sales is slightly less (only 95 percent) than the total profit from incremental sales earned by both the manufacturer and retailers. That is, there is a small double-marginalization problem and, hence, slightly less than the joint-profit-maximizing amount of retail price competition.

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retailer provides shelf space and consumers see them. Although retailer choice of product variety will have some interretailer competitive effects, we can assume for the purpose of the analysis that the purely promotional shelf-space-stocking decisions with regard to these products have essentially zero interretailer effects. Therefore, equation (7) will hold, and the retailer's return from stocking a particular new product will be less than the manufacturer's return.[18]

The retailer in our hypothetical example was assumed to receive only about 1/20th of the total gain (the sum of the retailer's and manufacturer's profit) from the incremental sales created by its supply of promotional shelf space for a particular product. Therefore, on the margin, the particular manufacturer has significantly more to gain if extra promotional shelf space is supplied for its product than the retailer has to gain. However, in many circumstances this actually overstates the retailer's overall gain from supplying promotional shelf space for a particular manufacturer's product. This is because, in addition to retailers not taking account of the manufacturer's profit on incremental sales, the supply of promotional shelf space may "cannibalize" the retailer's sales of other products.

For example, consider a supermarket's promotion of Coke by, say, the placement of Coke in a prominent end-of-aisle display. While this promotion will increase both the supermarket's and the manufacturer's sales of Coke, it also will likely simultaneously decrease the retailer's demand for and sales of competing products, such as Pepsi. Hence, the net quantity effect of the supermarket's promotional shelf space decision on its overall sales will be smaller than the effect on Coke sales. In terms of equation (6), $\partial Q_R/\partial S$ will be substantially less than $\partial Q_M/\partial S$. Consequently, the supermarket will have an even further reduced incentive to independently supply promotional shelf space for a particular brand compared with the manufacturer's incentive, and this reduced incentive exists even if the supermarket's incremental profit margin is not less than the manufacturer's profit margin.

Retailers also do not take account of the manufacturer's incremental profit margin when they decide to lower prices. However, the crucial economic difference between retailer promotional shelf space decisions and retailer price competition decisions is that with retailer price competition there are interretailer demand effects that, as we have seen, offset the retailer's failure to take account of the manufacturer's incremental profit margin. Specifically, in our hypothetical price competition example there was an offset to the lower retailer margin in the form of a 20-fold increase in ∂Q_R due to interretailer demand effects, so the manufacturer gets close to the desired amount of retailer price competition despite the fact that the retailer ignores the manufacturer profit margin when it lowers price. In contrast to retailer price competition, there are no interretailer

[18] Stocking decisions with regard to exclusive shelf space contracts that have potential interretailer effects are examined by Klein and Murphy (forthcoming).

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competitive effects to offset the lower retailer margin with regard to retailer supply of promotional shelf space.

It is important to recognize that this problem of insufficient retailer incentives to supply promotional shelf space for a particular manufacturer's product does not rest on a distinction between price and nonprice competition. Specifically, it is not the case that retailers always will supply less than the desired amount of nonprice competition. Retailer incentives will depend on the magnitude of interretailer demand effects from their provision of particular nonprice services. If a sufficient number of consumers value a retailer-provided nonprice service, such as convenient free parking, so that they will shift between retailers in response to its supply, then retailers will provide the desired quantity of these services. Although retailers will not consider the extra manufacturer profit from incremental sales produced by the supply of free parking, interretailer competition will force retailers to supply these nonprice services. It is because there are assumed to be no interretailer effects from retailer supply of promotional shelf space that retailers will supply less than the jointly profitable amount.

2.3. Competitive Manufacturer Bidding for Promotional Retail Shelf Space

The previous analysis implies that manufacturers must make side payments to retailers to induce them to supply promotional shelf space for their products. How much manufacturers will pay will be determined by manufacturer competition. We would expect Coke and Pepsi to be competing with one another in bidding for the supermarket promotional shelf space described above as well as competing for promotional shelf space with all other manufacturers of other products. The particular products chosen to be stocked and prominently displayed by a retailer, as well as the equilibrium value of promotional shelf space, will be determined by competitive bidding between manufacturers for the shelf space.

Competitive bidding by manufacturers for promotional shelf space can be expected to have two main economic effects. First, it will lead retailers to supply more total shelf space than they would otherwise find it in their interests to supply.[19] This is consistent with the dramatic growth since the early 1980s in total supermarket shelf space. As illustrated in Figure 1, supermarket shelf space relative to sales grew from 4.48 square feet per thousand dollars of real sales in

[19] The equilibrium quantity of shelf space supplied does not occur where the retailer's marginal cost of providing additional shelf space equals the manufacturer value of shelf space because there is an optimal size of supermarket that maximizes consumer convenience. Therefore, at some point the manufacturer benefits of increased promotional shelf space plus any consumer benefits of increased product variety will be outweighed by the increased supermarket costs of supplying additional space plus the consumer inconvenience of shopping in a larger store.

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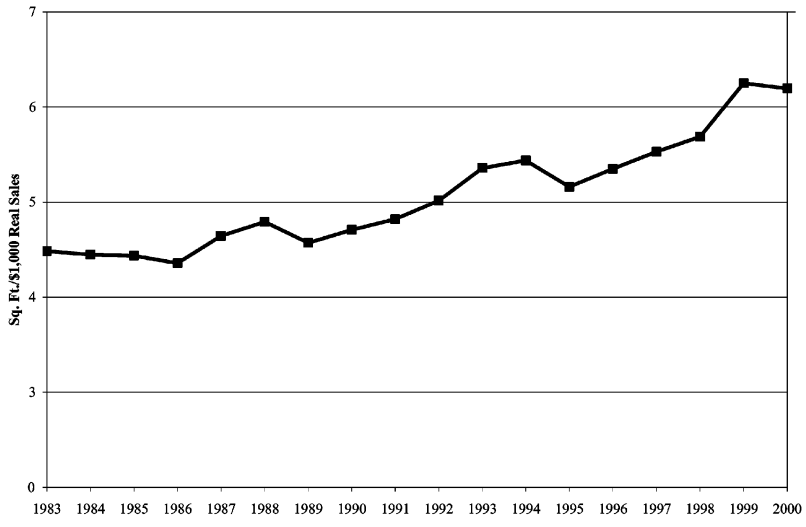

Figure 1. Supermarket square footage relative to sales

1983 to 6.20 square feet per thousand dollars of real sales in 2000, a 38 percent increase.[20]

Second, in addition to an increase in the total amount of supermarket shelf space, competitive bidding for shelf space can be expected to result in retailers stocking and prominently displaying a different distribution of products than otherwise would be chosen by retailers. Manufacturers of well-established, highly advertised products, such as Procter and Gamble's Tide detergent and Crest toothpaste, generally do not contract with retailers to stock their brands. These products must be stocked by retailers since they are demanded by a large number of consumers who would switch their purchases to another retailer if the products were not available.[21] In contrast to these highly advertised popular products,

[20] Total supermarket square footage is used as a proxy for total supermarket shelf and display space. The growth in total supermarket shelf space was accomplished entirely by an increase in the average size of supermarkets, which increased 65 percent from 1983 to 2000, while the number of supermarkets decreased 10 percent over the same period, which implies a net growth in total supermarket shelf space of 49 percent. Total real supermarket sales were relatively constant over the 17-year period, increasing only 7.8 percent, primarily because of the large increase in food consumption outside of the home (Progressive Grocer 1983–2000; Food Marketing Institute 1992–2000); 1990 supermarket square footage is based on a linear estimate from adjacent yearly data. Supermarket sales are in 1980 dollars, deflated by the Bureau of Labor Statistics Consumer Price Index Food at Home Index.

[21] This has led some researchers to claim that Procter and Gamble does not pay slotting fees (see, for example, Kelly 1991). However, Procter and Gamble must pay for shelf space for its brand extensions and to obtain particularly valuable promotional shelf space, such as more eye-level shelf "faces," end-of-aisle displays, or placement near the checkout registers. Retailer compensation may occur in these cases primarily with lower wholesale prices but also may include some per-unit-time slotting fees. This explains why other researchers claim that Procter and Gamble, in fact, does pay slotting fees. See, for example, FTC (2001a, pp. 144–45 [Flickinger]), and Copple (2002).

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manufacturers of less well established products compete for stocking privileges as well as superior shelf space.

The manufacturers with the greatest profitability from incremental sales (the products with the greatest promotion-induced increase in sales multiplied by the manufacturer margin—the right-hand side of equation [7]) will be able to pay the most for shelf space and will, holding any possible interretailer product variety demand effects constant, win this competition. Without shelf space contracts with manufacturers, retailers would allocate shelf space across products so that retailer incremental profit, or $(\partial Q_R/\partial S)(P_R - MC_R)$, would be approximately the same across all products. The retailer would not take account of the substantially higher marginal manufacturer profits that may exist on some products in determining what to stock. Slotting contracts are a way to efficiently clear the market demand and supply of shelf space, with manufacturers competing for shelf space with promises to pay retailers contingent on the supply of promotional shelf space for their products, leading to a solution analogous to what would occur if manufacturers were vertically integrated into retailing.

3. Fixed versus Variable Compensation for Retailer Shelf Space

The above analysis demonstrates the necessity for manufacturers to contract with retailers for promotional shelf space. These contracts generally are not written documents but usually involve unwritten commitments between the manufacturer and retailer.[22] A retailer, such as a supermarket, can be thought of as owning an asset that can affect a manufacturer's incremental sales. Competition among manufacturers leads to contractual arrangements whereby manufacturers compensate retailers for the use of this asset. However, our analysis to this point does not tell us what form these implicit contracts between manufacturers and retailers will take, in particular whether retailer compensation for promotional shelf space occurs with a lower wholesale price or a per-unit-time slotting fee.

Once the economic necessity for promotional shelf space contracts is established, this question of what form manufacturer compensation of retailers for shelf space is likely to take is of secondary importance. However, the unexplained recent growth in supermarket slotting fees (defined as the existence of some significant per-unit-time compensation) has led some economists to emphasize the importance of the form of shelf space compensation. Some economists have claimed that retailers demand a fixed per-unit-time slotting fee payment for shelf space rather than a variable lower wholesale price payment as a way to increase

[22] Whether a shelf space contract is written or not, it is almost always self-enforced, with the manufacturer ceasing payment to a retailer that does not supply the promised shelf space for its products (see Klein and Leffler 1981). Self-enforcement, which avoids the costs of court enforcement (delay, litigation costs, and imperfect court interpretation of the contractual understanding), is relatively inexpensive for slotting contracts because manufacturer detection of retailer nonperformance is easy, so the potential short-term gain to a retailer from nonperformance is small, which implies a small required self-enforcing premium. See note 14.

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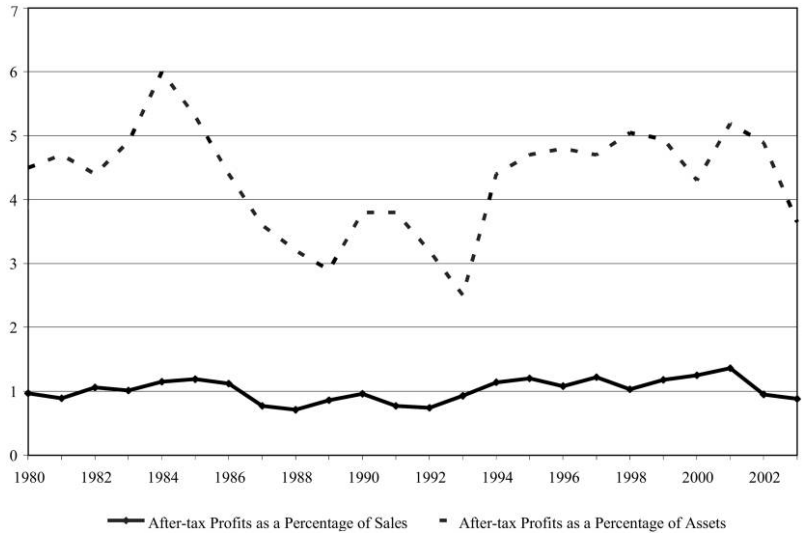

Figure 2. Supermarket profitability

their profits, arguing that, while a lower wholesale price can be expected to be competed away in lower retail prices, nonvariable slotting fees can be expected to generate excess retailer profits.[23] However, this does not explain why nonvariable slotting fees have increased over time. Moreover, it is inconsistent with the absence of any evidence of a positive effect of increased slotting fees on retailer profits. Figure 2 shows that supermarket profitability did not increase after 1981 as slotting fees became more prevalent. Supermarket net profits after taxes, both as a percentage of sales and as a percentage of measured assets, exhibit no significant positive time trend.[24]

[23] This competitive concern was expressed at the FTC workshop (FTC 2001a). For example, Greg Shaffer: "[I]f you give the retailer . . . upfront money, the retailer has no incentive to lower its price to sell more. It's got the money. . . . There's no marginal effect" (FTC 2001a, p. 181), and Robert Steiner: "[I]f it's not competed away, and if it were a variable cost in the food business, I think it would be competed away" (FTC 2001a, p. 142). Also see Shaffer (1991), in which, in addition to per-unit-time slotting fees directly increasing retailer profit, the author maintains that slotting (and the associated higher wholesale price to cover the increased costs of the slotting fee) reduces retailer price competition because a retailer that does not seek a lower wholesale price is essentially announcing its intention to other retailers to price less aggressively. This is assumed to lead other retailers to raise their prices and the original retailer to gain through feedback effects.

[24] Profits as a percentage of sales exhibit a statistically insignificant positive trend of less than 1 basis point per year after 1981, while profits as a percentage of assets exhibits a statistically insignificant negative trend of less than a tenth of a basis point per year after 1981. Profits as a percentage of sales are from Food Marketing Institute (1980–2003); profits as a percentage of assets are from Elitzak (1999) and U.S. Census Bureau, *Quarterly Financial Report for Manufacturing, Mining, and Trade Corporations* (http://www.census.gov/prod/www/abs/qfr-mm.html). The *Quarterly Financial Report* series (which covers a somewhat broader sample of supermarkets) is calculated as an average of quarterly data and is spliced to the *Food Cost Review* series by adding .62 percent (the average

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Supermarkets that receive shelf space payments on a per-unit-time basis do not earn greater than normal profits because supermarkets face significant interretailer competition with regard to overall pricing, product selection, and service quality.[25] Retailers are forced by this competition to pass slotting fees on to consumers in terms of lower overall prices and increased services because slotting fees collected by a supermarket are related to a supermarket's sales. Therefore, supermarkets competing for increased slotting fees lower prices (particularly prices of competitively sensitive products) and make investments to improve consumers' shopping experience in order to increase consumer traffic and their ability to sell shelf space to manufacturers at a higher price. Any individual supermarket that does not use the rents collected from slotting fees to reduce its quality-adjusted prices can be expected to lose significant sales and thereby collect lower slotting fees. Consequently, the existence of per-unit-time slotting fees does not result in consumers paying higher grocery prices or supermarkets earning higher profits.

If equilibrium retailer profitability is invariant to whether manufacturer compensation for promotional shelf space occurs with a per-unit-time or variable payment, what then are the potential advantages to a retailer or manufacturer of using slotting fees? First of all, it is important to recognize that the costs incurred by retailers in providing promotional shelf space for a particular manufacturer's product are primarily per-unit-time costs. In the short run, the costs are mainly the opportunity costs of not providing existing shelf space to another product; in the long run, the costs are mainly the land and building costs associated with supplying new additional shelf space. Therefore, in equilibrium, retailers must receive a minimum per-unit-time return on their shelf space. However, the per-unit-time "rent" paid by a manufacturer for shelf space need not occur in the form of a per-unit-time slotting fee.

From the manufacturer's perspective there will be an advantage in compensating retailers for shelf space with a lower wholesale price, rather than a per-unit-time payment, for two reasons. First, a lower wholesale price creates an added incentive for retailers to lower retail prices of the manufacturer's product, increasing manufacturer sales at the expense of rival brands.[26] Second, a wholesale price reduction is likely to be a superior way to measure the market value of

difference in the two series in the 1994–97 period) to the *Quarterly Financial Report* series for 1998–2003. The difference in these two series is relatively stable during 1994–97, with the standard deviation in the year-to-year difference in the two series equal to only .08 percent.

[25] Wright (2001) demonstrates that competition in the grocery retail market has remained vigorous despite substantial increases in concentration over the past 2 decades.

[26] Bronsteen, Elzinga, and Mills (2005) show that after Philip Morris instituted its promotional shelf space program, under which it offered retailers lower wholesale prices in return for shelf space and signage at the retailer checkout counter (a program that was unsuccessfully challenged on antitrust grounds by Philip Morris's competitors; see note 3), the retail prices of its cigarette brands fell relative to the price of competitor brands. In addition to buying promotional display space with its wholesale price discounts, Philip Morris's profit-maximizing price may have decreased because it was focusing on increasing sales to more elastic consumers who could be influenced to switch cigarette brands in response to this promotion.

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the shelf space provided by a retailer since differences in shelf space quality across retail stores and across locations within a store will be related to product sales. These advantages associated with variable retailer compensation lead to shelf space contracts, including many slotting contracts, that include wholesale price discounts as an element of compensation.

However, offsetting these obvious advantages of compensating retailers for promotional shelf space with a lower wholesale price is the cost to the manufacturer of using solely a lower wholesale price to generate the required shelf space rents when there is significant interretailer competition in the sale of the manufacturer's product. For example, assume initially that retailers face no interretailer competition on the particular manufacturer's product, so each retailer faces the manufacturer's elasticity of demand.[27] Further assume that the equilibrium shelf space rental is $100 per unit time, with each retailer selling 100 units of the manufacturer's product per unit time at current prices. In these circumstances, the manufacturer could create the required shelf space rental by lowering the wholesale price by approximately $1 to all retailers.[28]

Alternatively, retailers may face significant interretailer price competition on the manufacturer's particular product. This may occur if the particular product price is used by consumers as an indication of overall average retailer prices or if consumers use a product price differential between retailers as an opportunity to stock up on the product at another retailer.[29] In these circumstances, each retailer's perceived elasticity of demand is now greater than the manufacturer elasticity it faced when there was no interretailer price competition. Therefore, in response to the manufacturer's wholesale price decrease, each retailer will have an incentive to lower its retail price by a larger fraction of the wholesale price decrease than when the retailer did not face any interretailer price competition on the manufacturer's product. However, because the manufacturer is providing payment for shelf space with a lower wholesale price to all retailers, retailers as a group actually will experience a quantity increase given not by their individual demand elasticities but by the manufacturer's smaller demand elas-

[27] This assumption may not be unrealistic because an individual product is a small part of the large bundle of goods purchased by the consumer from the retailer. See note 16.

[28] The required wholesale price decrease will be somewhat less than $1 because, absent interretailer competition in the sale of the manufacturer's product, each retailer would reduce its retail price somewhat and increase its profit above $100 per unit time in response to a $1 wholesale price decrease. With no interretailer price competition, each retailer is facing $1/n$th of the market demand for the manufacturer's product and experiences a profitable quantity increase in response to its price decrease. Therefore, the manufacturer need not lower wholesale price by the full dollar.

[29] It is widely recognized that interretailer price elasticity is greater on some supermarket products than others. For example, products that are purchased more frequently (and are easier for consumers to compare prices across stores) or products that have highly publicized prices (for example, local newspapers often publish prices at different supermarkets of a representative "basket" of goods) are used by consumers as an indication of the overall level of a supermarket's prices and are likely to have greater interretailer price elasticities. Supermarkets may not be able to let prices on these goods deviate by more than a small percentage from their competitors' prices before many consumers switch stores for the purchase of these and other less price sensitive products. See Dahlgran et al. (1991).

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ticity, so the manufacturer's shelf space payments to retailers will be eroded. Consequently, the manufacturer must reduce the wholesale price by more than $1 in order for the retailer to earn the equilibrium per-unit-time shelf space rental return.[30]

The greater the interretailer competition on the manufacturer's product is, the greater will be the decrease in the product's retail price for any wholesale price decrease, and, therefore, the greater the "extra" wholesale price reduction by the manufacturer required to create the equilibrium shelf space rental return. In the limiting case in which there is perfect interretailer competition on the particular product, so the product's retail price can be expected to fall by 100 percent of the wholesale price discount, no manufacturer wholesale price reduction, however large, could generate the required retailer shelf space rent.

Manufacturers must make an extra reduction in the wholesale price when retailers face interretailer price competition on the particular manufacturer's product because retailers must be compensated at market rates for supplying promotional shelf space. Although all excess retailer profits will be competed away by interretailer competition, with retailers lowering the particular product prices or supplying the increased services that have the greatest overall competitive effects, retailers must earn a return on their promotional shelf space that covers their opportunity costs of supplying such space to a particular manufacturer. If interretailer competition on the particular manufacturer's product eliminated all the profit earned by the retailer on the particular shelf space, retailers would prefer to supply their promotional shelf space to another manufacturer that provided compensation at least partially with a per-unit-time payment. Retailers could then use the per-unit-time shelf space compensation to optimally decide on which products it will reduce price or which added services it will supply so that it would have the greatest overall interretailer competitive effects.[31] Therefore, we would not expect compensation paid for providing promotional

[30] The cost to the manufacturer of the extra wholesale price decrease when there is interretailer competition is offset to some extent because the lower wholesale and retail prices increase the sales of the manufacturer's product as a result of interbrand competition within each retailer. However, there is a cost to the manufacturer of the extra wholesale price reduction necessitated by interretailer competition that does not increase overall manufacturer sales. In these circumstances, the manufacturer must set the wholesale price below the profit-maximizing level to generate the competitive equilibrium retailer payment for promotional shelf space.

[31] Manufacturers also may use a lower wholesale price and a slotting fee together because they are buying retailer promotional shelf space at the same time that they are running a temporary price promotion. The two tactics are often complements because the manufacturer may be using the price promotion to get new customers to try its product and, therefore, wants to attract attention from customers who are not otherwise planning to purchase the product. In such cases, rather than manufacturer concern that interretailer competition may eliminate a significant fraction of retailer profit and require a further wholesale price discount to generate the retailer shelf space rent, the manufacturer may be more concerned that the special sale price will not be passed on to the consumer. Many end-cap promotional arrangements, therefore, contractually require the retailer to pass on a particular percentage of the wholesale price discount in a lower retail price and require a particular retailer volume commitment and cooperative advertising of the special price. These practices are discussed in U.S. Department of Justice (1996, pp. 6, 7). See also Winer (2007, p. 314).

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shelf space for a particular product to be competed away with lower retail prices of the particular product.[32]

Therefore, while there are incentive and measurement benefits associated with compensating retailers for shelf space with a lower wholesale price rather than a per-unit-time payment, the advantage to the manufacturer of using primarily a lower wholesale price to compensate retailers for shelf space decreases as the degree of interretailer competition on the particular product increases. In general, a point will be reached where interretailer price competition on the manufacturer's product is so significant that a lower wholesale price is an inefficient way for the manufacturer to compensate retailers for the supply of promotional shelf space. When this occurs, at least a fraction of compensation will take the form of a per-unit-time payment. This explains why per-unit-time slotting fees are, in fact, used more frequently for products for which there is significant interretailer price competition (see White, Troy, and Gerlich 2000).[33]

One may mistakenly believe that the type of products that use promotional shelf space are primarily impulse demand products that have low interretailer price elasticities and that, therefore, compensation for promotional shelf space with a lower wholesale price would be unlikely to lead to significantly lower retail prices. However, retailers generally sell a manufacturer's product to a mix of both impulse and nonimpulse consumers. Even a new product that may initially be purchased entirely by consumers as an impulse sale will eventually develop loyal demanders who know they wish to purchase the product and may switch their purchases to retailers that are selling the product at lower prices. Therefore, retailers will lower retail price in response to a manufacturer's wholesale price decrease by substantially more than if they were selling the product

[32] The fact that slotting fees were unlikely to result in lower prices of the particular product was used in an attempt to justify the proposed merger of the number two and number three baby food manufacturers, Beech-Nut and Heinz. Gerber, the most advertised baby food brand with the greatest sales, was almost universally stocked by supermarkets without the payment of slotting fees. Beech-Nut and Heinz, on the other hand, competed to be the supermarket's second stocked brand by paying slotting fees. It was incorrectly claimed by the merging parties that if Beech-Nut and Heinz no longer had to compete for retailer shelf space after the merger, the savings in slotting fees would be an economic efficiency that would result in lower consumer prices. The district court implicitly accepted this faulty reasoning in denying the FTC's challenge of the merger, contending that the FTC did not prove that competition for retail distribution was an important part of the competitive process that affected baby food prices. The court found persuasive the testimony from Heinz's economic expert showing that retailer receipt of slotting fees did not affect retail prices of baby food (*FTC v. H. J. Heinz Co.*, 116 F. Supp.2d 190, 197 [D.D.C. 2000]). The D.C. Circuit rejected the district court's view, but not by adopting our economic analysis whereby the elimination of baby food slotting fees would likely increase overall average supermarket prices. Instead, the D.C. Circuit concluded that the district court held the FTC to a higher standard than required under section 7 of the Clayton Act and that the reduction in competition for baby food distribution and the resulting reduction in slotting fees would increase baby food prices (*FTC v. H. J. Heinz Co.*, 246 F.3d 708, 719 [D.C. Cir. 2001]).

[33] It also explains why manufacturers sometimes use resale price maintenance to more directly prevent interretailer price competition on the particular product for which they have purchased shelf space. For example, Hartz Mountain used resale price maintenance in combination with wholesale price discounts and other promotional payments in distributing its pet products through supermarkets (*In re: The Hartz Mountain Corp.*, 95 F.T.C. 280 [1980; consent order]).

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solely to impulse consumers and faced little interretailer competition, increasing the manufacturer's wholesale price decrease required to compensate retailers for shelf space.[34]

Interretailer individual product competition considerations also explain why Wal-Mart accepts promotional shelf space payments primarily in the form of lower wholesale prices rather than slotting fees. Although Wal-Mart faces significant overall interretailer competition and can be expected to pass on to consumers a large fraction of the wholesale price savings it receives, Wal-Mart has created loyal customers who know that Wal-Mart charges a low overall package price on their purchases. Wal-Mart's policy is not to advertise low prices of individual products but to advertise the fact that it has low overall everyday prices, and this is the reputation it has created among its consumers. Wal-Mart, therefore, is not forced by interretailer competition to pass a large fraction of any individual wholesale price discount on to consumers on the particular product's retail price. Consequently, manufacturers can obtain the added benefits of making promotional payments for shelf space at Wal-Mart primarily with lower wholesale prices.[35]

In addition to the importance of interretailer individual product price elasticities, the incidence of slotting will also be related to the value of the promotional shelf space. As the required market compensation for shelf space increases, the likelihood that a significant per-unit-time payment will be part of the compensation increases. This relationship holds even if we assume that the fraction of shelf space compensation that consists of a per-unit-time slotting fee remains constant. However, there are economic reasons to expect the fraction

[34] Sometimes impulse sales occur at different locations within a store than the more price sensitive nonimpulse sales (for example, candy and chewing gum impulse sales made at the checkout counter as distinct from sales of the same products made from the shopping aisles). However, a manufacturer would find it difficult to pay for checkout counter promotional shelf space by reducing the wholesale price solely on checkout counter sales because the retailer would attempt to arbitrage the differential wholesale prices. The manufacturer, therefore, will pay the retailer a per-unit-time slotting fee on the promotional shelf space, which is logically equivalent to a lower wholesale price solely on the goods sold at the promotional shelf space.

[35] The fact that slotting contracts are used by small retailers without any bargaining power over manufacturers and that the largest retailer, Wal-Mart, generally does not accept slotting fees is fundamentally inconsistent with the view that slotting contracts are a consequence of the anticompetitive strategic exercise of market power by retailers. Specifically, it is inconsistent with the models presented in Marx and Shaffer (2007) and Rey, Thal, and Vergé (2006). In Marx and Shaffer (2007), retailers with bargaining power are assumed to use slotting fees to increase their profits by excluding other retailers from distributing a manufacturer's product. This reverses the usual exclusivity arrangement, in which a retailer agrees to carry only one manufacturer's product in a particular category and, instead, unrealistically assumes that a retailer with bargaining power forces the manufacturer to choose the retailer as the sole distributor of its product in return for a lump-sum payment by the retailer to the manufacturer, a part of which the manufacturer returns to the exclusive retailer in the form of a slotting fee. The Rey, Thal, and Vergé (2006) model similarly unrealistically assumes the existence of retailer lump-sum payments made to manufacturers that are offset by slotting fees conditional on the retailer's agreement to carry the manufacturer's product. But, in contrast to Marx and Shaffer, the retailer lump-sum payments amount to a commitment among retailers to charge the monopoly price without the inefficient exclusion of retailers.

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of shelf space compensation that consists of a per-unit-time slotting fee to increase as the value of shelf space increases.

For example, consider more valuable shelf space, such as an end cap, and assume that manufacturers must transfer to the retailer $200 per unit time, rather than the $100 of our previous hypothetical. The extra costs per unit time of using solely a lower wholesale price to generate the required shelf space rental return will double for any given level of interretailer product price competition. Moreover, the interretailer product price elasticity is likely to increase with the value of shelf space. This is because we can expect consumers to switch the retailer from whom they purchase a particular product based on the absolute difference in retailer prices since the added shopping costs are fixed. Accordingly, the extra costs of using a lower wholesale price rather than a per-unit-time payment will more than double, further increasing the likelihood that shelf space compensation will include a significant slotting fee.

These economic considerations also explain the growth of slotting fees over time. As we shall see in the following section, the demand and overall value of supermarket promotional shelf space has increased over time because of increasing manufacturer product margins, substantially increasing the economic value of promotional shelf space and the presence of slotting fees.[36]

4. The Promotional Services Theory Is Consistent with the Evidence

4.1. The Growth in Slotting Since the 1980s

There are three major existing theories of slotting, all of which claim that the increase in slotting since the early 1980s can be explained by the increase in new supermarket products. The annual number of new supermarket product introductions has increased more than eightfold over this period, from 2,782 new products introduced in 1981 to 23,181 new products introduced in 2003 (*New Product News*, 1980–2000, from Harris et al. [2002] and Food Institute [2004]).[37]

[36] There is an offsetting effect when increasing demand for promotional shelf space is due to a higher manufacturer margin because the economic benefit to a manufacturer of using a reduction in the wholesale price as a way to pay for promotional shelf space increases, as manufacturers find it more economic to move down their demand curves. Consequently, although total shelf space compensation will increase, which will increase slotting fees, the fraction of compensation in the form of a per-unit-time slotting fee may not increase.

[37] Sullivan (1997, pp. 475–76) claims that this increase in new supermarket products was the result of a decrease in new product development costs caused by the adoption of scanning technology by large supermarket chains in 1981, which led to the collection and sale of scanner data by marketing research firms. However, it is doubtful that new product growth can be explained by this technological change. The marketing to narrower consumer segments has been a long-term general phenomenon in many segments of the economy, including industries (such as automobiles) that have nothing to do with scanner technology. See, for example, Kotler (2003, pp. 284–85); Cox and Alm (1999), which documents examples of "mass customization" across the economy; and Gladwell (2004), which documents ketchup as an exception to the general trend toward brand extensions and narrower consumer segmentation in grocery products.

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These theories, however, do not adequately explain why this dramatic increase in introductions of new products has led to slotting contracts.

One theory emphasizes the increased transaction costs borne by retailers in stocking a larger number of new products, including the costs of entering new product information into a computer, warehousing the new products, and physically placing the new products on the shelf (see, for example, Freeman 1986, p. 31). Retailer organizations have adopted this explanation at congressional hearings and in advocacy material (see Food Marketing Institute 2002). However, an explanation for slotting that is based on the increased transaction costs of stocking the larger number of products now carried by supermarkets is inconsistent with the fact that slotting fees are much greater than these narrow transaction costs.[38] Moreover, this explanation is also inconsistent with the fact that slotting varies substantially across products and covers established products for which additional transaction costs are likely to be minimal.

A second theory uses the growth in new products to explain slotting by emphasizing the risk a retailer takes when deciding to stock an unproven new product in terms of the opportunity costs of potential lost profits on its shelf space. Slotting fees are claimed to compensate retailers for these risks. Most models further hypothesize that slotting serves the function of a screening device to assist the supermarket in determining which of the many new products are more likely to succeed in an environment in which manufacturers are assumed to have information superior to that of retailers.[39] However, this view of slotting is also inconsistent with the fact that slotting fees and other promotional allowances are often paid by manufacturers on established products with predictable demand and that slotting contracts are often renewed after supermarkets have market experience with a particular new product.[40]

Both of these theories rely on an increase in supermarket costs associated with introductions of new products to explain the growth in slotting. However, more relevant than any increase in transaction costs or risk costs that may be associated

[38] One large retailer surveyed in the FTC (2003) stated that the costs associated with stocking a new product consisted of (1) $1,000 in labor costs to place the new product on the shelves in all of the retailer's stores, (2) $1,200 to place the new product in inventory, and (3) $600 to place the new item in the retailer's computer system (FTC 2003, p. 10). These costs appear to be one-time costs, not per-unit-time costs, and to be significantly smaller than the average slotting fees paid to retailers. For example, the range in the average slotting fee per regional grocery chain reported by FTC (2003) for an initial 6-month period was $6,819–$10,625, a sum significantly greater than the estimated one-time transaction costs associated with stocking a new product.

[39] Such screening models are common in the economics literature on slotting. See, for example, Chu (1992), Desai (2000), Lariviere and Padmanabhan (1997), and FTC (2003, pp. 1–2). Sudhir and Rao (2004) test signaling and other models of slotting using survey data on new product offers from a single retail chain in 1986–87. The authors conclude that slotting shifts the risk of new products from retailers to manufacturers and also mitigates retail competition, as described by Shaffer (1991). However, as discussed at note 24, the growth in slotting has not been correlated with an increase in retailer profitability.

[40] Screening models also generally do not take account of the possibility that manufacturers could make some alternative contingent arrangement, such as introductory price allowances based on sales and liberal refunds for product returns, to insure retailers against the failure of new products.

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with new product introductions emphasized by these theories is the increase in supermarket operating costs caused by the increase in shelf space devoted to new products. As described above, the increase in new products since the early 1980s has resulted in a large increase in the size of supermarkets. The number of stock-keeping units (SKUs) stocked by the average supermarket over the 1980–2003 period has increased more than 270 percent,[41] with a nearly 40 percent increase in the amount of shelf space provided by supermarkets per dollar of sales (see note 20 and Figure 1). More importantly, the transaction cost and risk cost theories do not attempt to answer the fundamental economic question underlying the existence of slotting contracts, namely, why consumers do not pay for the higher costs of supermarket operations in a higher retail price, instead of having manufacturers cover the increased costs with a per-unit-time slotting fee.

A third theory of slotting, developed in Sullivan (1997), also uses the growth in introductions of new products to explain slotting. But, in contrast to the transaction cost and risk cost theories, Sullivan correctly focuses on the increase in supermarket shelf space costs over time and attempts to answer the fundamental economic question of why manufacturers have paid for this increased cost with slotting fees. Sullivan explains the increased use of per-unit-time slotting fees by assuming that the growth in the number of new products and the resulting increase in supermarket shelf space costs per dollar of sales has not created an offsetting benefit to consumers. This is so, she asserts, because most new products have been brand extensions that have not reduced consumer search costs and shopping time.[42] In particular, Sullivan's demand model assumes fixed retail prices, with consumer demand driven solely by search cost considerations. This eliminates the possibility that consumer demand for product variety could affect individual supermarket demand. Supermarkets providing increased product variety cannot experience an increase in their demand and thereby an increase in margins or sales. Because consumers are assumed not to be willing to compensate supermarkets through increased margins or greater sales when supermarkets increase product variety, slotting fees are necessary, according to Sullivan, to

[41] Stock-keeping units (SKUs) per supermarket increased from 9,400 per store in 1980 to 35,000 per store in 2003 (Progressive Grocer 1983–2000). This fact is inconsistent with the claim that slotting arrangements have reduced product variety (FTC 2003, pp. 3–4, citing Shaffer 2005). Although exclusive slotting contracts may reduce product variety in a particular product category (generally leaving consumers on net better off; see Klein and Murphy [1988]), slotting contracts also increase the return to retailers of providing shelf space, creating an incentive for retailers to build larger stores and stock more products.

[42] While this is largely true, to some extent the growth in the number of SKUs per supermarket has involved an increased number of product lines and not solely brand extensions. Supermarkets have not allocated their increase in shelf space entirely to traditional grocery products and, for example, now carry an increased number of drugstore items. Supermarket pharmacy department sales, including nonprescription sales, increased from 1.94 percent to 5.15 percent of total supermarket sales from 1992 to 2000. See National Association of Chain Drug Stores Economics Department (2008); for total supermarket sales data, see Progressive Grocer (1983–2000). This likely has resulted in some overall reduction in consumer shopping time.

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allow supermarkets to recover their higher costs of providing increased shelf space for stocking new products.

However, consumers generally should be willing to pay for increased product variety that raises supermarket selling costs. Brand extensions, even if they do not decrease consumer search costs, presumably are valuable to consumers (see, for example, Hausman 1997). A supermarket that increases its shelf space and takes on an increased number of new products, increasing its costs by decreasing its sales per square foot, is producing benefits for consumers in terms of increased product variety. Therefore, interretailer competition should result in supermarket compensation for this consumer benefit in the form of an increased margin and/or increased sales. Specifically, competition will result in supermarkets choosing the optimal subset of products that are demanded by consumers, and consumers will pay for the increased costs of increased shelf space per dollar of sales in an increased supermarket margin, even if there is no decrease in search costs. In these circumstances, a separate slotting contract would not be necessary to compensate supermarkets for their higher selling costs. On the other hand, if there were no consumer demand for increased variety, competition among supermarkets would not have led to an increased number of SKUs and higher retailer costs in terms of lower sales per square foot. Competitive supermarkets could have provided a more limited number of products and, hence, have larger sales per square foot and lower costs.

The answer to this conundrum is provided by our promotional shelf space model, in which consumers are unwilling to fully compensate retailers for the increased retailing costs associated with stocking an increased number of products, and yet an increased number of products are stocked by competitive retailers because retailers are in the business of supplying promotional shelf space to manufacturers. The increase in the number of products sold in larger supermarkets does not reflect solely an increase in consumer demand for variety; it also reflects an increased manufacturer demand for promotional shelf space. The increased retailing costs associated with larger stores and the increased number of SKUs per store is at least partially a response to this increased manufacturer demand for promotional shelf space. Manufacturers, therefore, must pay supermarkets for operating in a way in which supermarkets are not able to obtain direct consumer compensation.[43] Our promotional shelf space theory, therefore, fills in an important gap in Sullivan's theoretical framework, explaining why manufacturers pay retailers directly for promotional shelf space.

Our theory also explains why manufacturer payment of supermarkets for the provision of promotional shelf space has increasingly involved slotting fees. The movement to slotting fees can be explained by the substantial increase since the early 1980s in the market value of promotional shelf space due to a substantial

[43] The absence of direct consumer compensation does not mean that the supply of promotional shelf space implies social inefficiency (see Becker and Murphy 1993). Moreover, the resulting equilibrium, at which marginal consumers receive an effective price discount in the form of promotional shelf space paid for by manufacturers, is a consequence of the competitive process.

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increase in the demand for such shelf space.[44] As described above, an increase in the value of promotional shelf space can be expected to result in the increased use of slotting because, for any given level of interretailer competition on a manufacturer's product, the cost to manufacturers of paying retailers for shelf space entirely with a reduction in the wholesale price will increase as the required wholesale price reduction increases.[45]

The growth in demand for promotional shelf space can be attributed, in part, to the growth in the number of introductions of new products. The effect of promotional shelf space in creating incremental manufacturer sales, $\partial Q_M/\partial S$, is likely to be high for new products.[46] However, in addition to the growth in demand for promotional shelf space for new products, manufacturer demand for promotional shelf space has increased since the early 1980s owing to an increased demand by manufacturers to use shelf space to promote established products. Our promotional shelf space theory explains why this has occurred.

A key economic insight of our promotional shelf space theory, summarized in equation (7), is that an important factor creating an incentive for manufacturers to contract with retailers for promotional shelf space is the size of the manufacturer's margin compared with the retailer's margin. This measures the differential benefits to the manufacturer compared with the retailer with regard to the supply of promotional shelf space for the manufacturer's product. Since grocery retailing is highly competitive and the supermarket margin is likely to have remained relatively constant over time, our theory predicts that the demand for and value of promotional shelf space and, therefore, the incidence of shelf space contracts and the compensation for shelf space will depend on the margin earned by manufacturers on shelf-space-induced incremental sales.

In predicting the demand for promotional shelf space over time, value added as a fraction of sales can be used as a proxy for the manufacturer margin.[47]

[44] Because there are decreasing returns to scale in terms of the size of supermarkets that optimizes both product variety and consumer convenience, an increased manufacturer demand for promotional shelf space will lead to an increased value of supermarket promotional shelf space. The fact that supermarkets are earning rents on their economically limited promotional shelf space, however, does not mean that they are earning rents overall. The evidence indicates that interretailer competition on overall prices and services has eliminated any supermarket rents. See Figure 2 and the related discussion.

[45] Rather than focus on the relative efficiency of a per-unit-time payment as the value of promotional shelf space increases, Sullivan's alternative, unconvincing answer for why per-unit-time slotting fees did not occur before the early 1980s is that retailers feared antitrust litigation, a fear that she claims was finally outweighed by the retailer benefits of accepting slotting fees as the value of shelf space increased (Sullivan 1997, pp. 480–83). This does not tell us why the benefits of compensating retailers for shelf space with slotting fees increased compared with compensation with wholesale price discounts.

[46] As discussed, although a manufacturer may be able to use a lower wholesale price to purchase shelf space for an entirely new product because all sales are to marginal consumers, over time demanders of the product will become a mix of marginal and inframarginal consumers, and the manufacturer must move to a per-unit-time slotting fee.

[47] Value added is revenue minus the cost of goods purchased. If the extent of vertical integration does not change over time and processing technology also does not change, this would be expected to be highly correlated with manufacturer margin.

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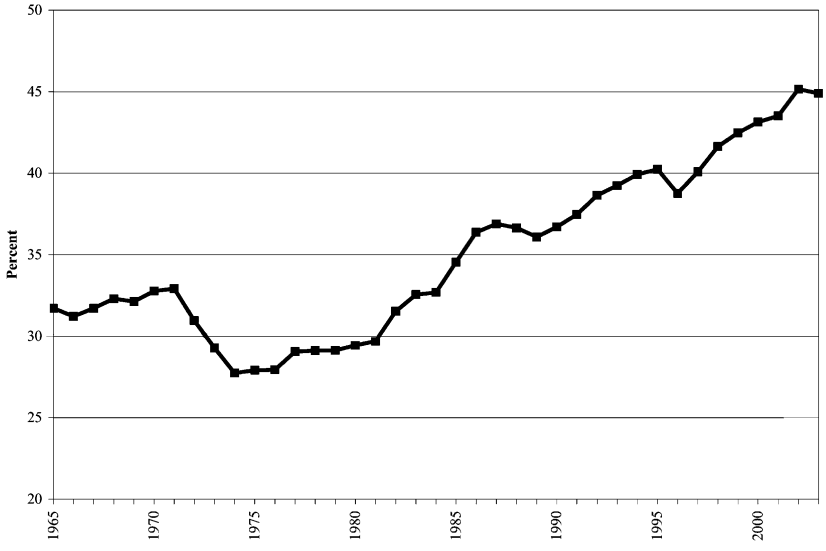

Figure 3. Value added as a percentage of sales for food and beverage manufacturers

Figure 3 shows that value added as a fraction of sales for food and beverage manufacturers has increased substantially since the early 1980s. From 1965 to 1981, value added as a fraction of sales varied from a low of 27.7 percent in 1974 to a high of 32.9 percent in 1971.[48] In 1984 (Sullivan's starting date for slotting contracts), value added as a fraction of sales was at 32.7 percent, close to the high of the previous 20 years, after which it increased dramatically over the next 2 decades, reaching a level of 44.9 percent in 2003.

The change in trend in value added to sales (VA/*S*) over the 1965–2003 period can be illustrated by the following regression:

$$\frac{\text{VA}}{S} = \underset{(42.7)}{.305} - \underset{(-.5)}{.0003t} + \underset{(6.7)}{.0035Dt} \quad (\bar{R}^2 = .89), \tag{8}$$

where t is a time trend, D is a dummy variable equal to one for years starting in 1984, and t-statistics are presented under the coefficients. Although there was no significant trend for the first 20 years, a significant rising trend in value added as a fraction of sales of a little more than a third of a percentage point per year occurred after 1984. This trend in value added as a fraction of sales was caused

[48] Value added as a fraction of sales is from the U.S. Census Bureau, Census of Manufactures (1977, 1987, 1992, 1997), Economic Census (2002), and Annual Survey of Manufactures (1993–96, 2002–3). The 1965–96 series is calculated using standard industrial classification (SIC) 20 (food and kindred products including beverages); the 1997–2003 series is calculated using North American industry classification system (NAICS) 311 (food manufacturing) and NAICS 3121 (beverage manufacturing).

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primarily by a consumer shift in many grocery product categories toward more specialized branded products with relatively greater manufacturer margins, including the growth of branded packaged/frozen grocery products relative to, for example, unbranded fresh produce.[49] This trend coincides with the introduction and growth of slotting allowances in grocery retailing. Since the incidence of per-unit-time slotting fees is likely to increase as overall shelf space compensation increases, this is consistent with our promotional shelf space theory.

4.2. Cross-Product Incidence of Slotting

In addition to explaining the time trend of slotting, our promotional shelf space theory of slotting predicts which products are likely to use slotting. Specifically, in contrast to the assumption made by other theories of slotting that slotting is used solely for new products,[50] our theory implies that slotting fees will also be used for established products for which (for a given promotional sales effect of shelf space) manufacturer margins are greatest.

The FTC report indicates that products for which slotting is frequently used include frozen food, dry grocery (nonperishable food items), and beverages, while products for which slotting is infrequent include fresh meat and seafood, produce, and deli items (FTC 2001b, p. 11 n. 17). Suppliers of a broad range of other grocery products, including general and specialty breads, greeting cards, tortillas, air fresheners, baby food, and spices, also report the frequent use of slotting payments.[51] We also know from a 1997 study comparing tobacco industry practices with other products that tobacco slotting payments were reported to be the most frequent and of the highest magnitude, followed in order of magnitude of the average payment by the beer and wine industry and then by the snack food industry and soft drinks (see Feighery et al. 1999).

Table 1 breaks the Census of Manufacturers' North American industry classification system (NAICS) classifications for food manufacturing into products for which we have evidence that significant slotting fees are paid and products for which we have evidence that slotting fees are generally not paid. When we have no evidence regarding slotting fees, we label the product category in Table 1 as "not classified." We classify each 4-digit industry group and, where we have separate evidence, 5-digit industry groups.

Table 2 compares the ratio of value added to shipment value in 2003 for the product categories associated with the frequent use of slotting with the ratio of

[49] For instance, supermarket sales of branded produce and prepared fresh-cut salads increased from 8 percent of total produce sales in 1987 to 34 percent in 1997 (Kaufman et al. 2000).

[50] Sullivan (1997, p. 461), in fact, defines slotting solely in terms of new products.

[51] FTC 2001b, p. 20; *FTC v. H.J. Heinz Co.*, 116 F. Supp. 2d 190 (D.C.C. 2000), rev'd, 246 F.3d 708 (D.C. Cir. 2001); *FTC v. McCormick*, FTC Dkt. No. C-3939 (2000). Sudhir and Rao (2004) analyze introductions of new products for a single retail chain and find the incidence of slotting payments across product categories broadly consistent with the FTC evidence. In particular, the retailer received slotting allowances on 14 percent of all products, with baby foods (43 percent), fruits, vegetables, juice and drinks (24 percent), household supplies (20 percent), frozen foods (17 percent), and beverages (16 percent) being the product categories with greatest slotting frequency.

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Table 1
Classification of Industries by Existence of Slotting

NAICS Code	Industry Group	Slotting/Nonslotting
3111	Animal food manufacturing	Not classified
3112	Grain and oilseed milling	
31121	Flour milling and malt manufacturing	Nonslotting
31122	Starch and vegetable fats and oils manufacturing	Nonslotting
31123	Breakfast cereal manufacturing	Slotting
3113	Sugar and confectionery product manufacturing	
31131	Sugar manufacturing	Nonslotting
31132	Confectionery product manufacturing	Slotting
3114	Fruit and vegetable preserving and specialty food manufacturing	
31141	Frozen food manufacturing	Slotting
31142	Fruit and vegetable canning, pickling, and drying	Not classified
3115	Dairy product manufacturing	
31151	Dairy product (except frozen) manufacturing	Nonslotting
31152	Ice cream and frozen dessert manufacturing	Slotting
3116	Meat product manufacturing	Nonslotting
3117	Seafood product preparation and packaging	Nonslotting
3118	Bakeries and tortilla manufacturing	Slotting
3119	Other food manufacturing	
31191	Snack food manufacturing	Slotting
31192	Coffee and tea manufacturing	Not classified
31193	Flavoring syrup and concentrate manufacturing	Not classified
31194	Seasoning and dressing manufacturing	Slotting
31199	All other food manufacturing	Not classified
3121	Beverage manufacturing	Slotting
3122	Tobacco manufacturing	
31221	Tobacco stemming and redrying	Not classified
31222	Tobacco product manufacturing	Slotting

Source. North American industry classification system (NAICS) industry codes are from U.S. Census Bureau (2005, table 2). Classifications of slotting are from various sources. See note 51; Feighery et al. 1999; FTC 2001b, p. 11 n. 17.

value added to shipment value for which slotting is believed to be an infrequent practice. Where slotting is observed to occur frequently, the weighted average ratio of value added to shipment value is 63.1 percent; where slotting is not observed, the weighted average ratio is 31.8 percent. In fact, there is absolutely no overlap in these two sample distributions, with the lowest ratio of value added to shipment for slotting products more than 14 percentage points above the highest ratio of value added to shipment for nonslotting products. Using the Wilcoxon rank sum test to compare the centers of these two small sample size populations, the null hypothesis that the median of value added relative to sales for products with slotting equals the median for products without slotting is rejected at the .01 level.[52] These results clearly indicate that, consistent with our

[52] The test statistic is the sum of the ranks for the nonslotting group, equal to 21, which is less the critical value of 48, so the null hypothesis can be rejected at the .01 level. If we apply a parametric *t*-test, the simple *t*-statistic is 5.81, and using weighted averages it is 16.9; in both cases the *p*-value is less than .01.

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Table 2
Ratios of Value Added to Value of Shipments for Slotting and Nonslotting Industries in 2003

NAICS Code	Industry Group	Ratio (%)
	Slotting industries:	
31123	Breakfast cereal manufacturing	77.3
31132	Confectionery product manufacturing	59.4
31141	Frozen food manufacturing	54.7
31152	Ice cream and frozen dessert manufacturing	52.9
3118	Bakeries and tortilla manufacturing	66.0
31191	Snack food manufacturing	60.6
31194	Seasoning and dressing manufacturing	53.3
3121	Beverage manufacturing	52.3
31222	Tobacco product manufacturing	87.9
		63.1[a]
	Nonslotting industries:	
31121	Flour milling and malt manufacturing	29.6
31122	Starch and vegetable fats and oils manufacturing	27.0
31131	Sugar manufacturing	33.6
31151	Dairy product (except frozen) manufacturing	31.0
3116	Meat product manufacturing	32.9
3117	Seafood product preparation and packaging	38.1
		31.8[a]

Source. U.S. Census Bureau (2005, table 2)
Note. Confectionery product manufacturing is labeled as North American industry classification system (NAICS) code 31132 but is the sum of NAICS codes 31132 (chocolate and confectionery manufacturing from cacao beans), 31133 (confectionery manufacturing from purchased chocolate), and 31134 (nonchocolate confectionery manufacturing).
[a] Weighted average.

promotional services theory, the existence of slotting is significantly positively related to a product's manufacturer margin.[53]

5. Conclusion

This article provides a procompetitive business justification for contractual arrangements that involve manufacturer purchase of retail shelf space. When the promotional value of retailer shelf space is high, slotting is likely to be an efficient element of the shelf space contract. Our analysis explains why there has been an increase in slotting contracts since the early 1980s, why products with relatively high manufacturer margins are more likely to use slotting contracts, and why supermarket profits have not increased over time as slotting has become more extensive.

A number of courts have explicitly recognized that competition for shelf space is an essential element of competition. Judge Easterbrook clearly recognized this when he noted that "[c]ompetition-for-the-contract is a form of competition

[53] This result is consistent with the recent finding that manufacturer margins are significantly positively related to all types of retailer promotional payments (Rennhoff 2004b).

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that antitrust laws protect rather than proscribe, and it is common" (*Paddock Publications, Inc. v. Chicago Tribune Co.*, 103 F.3d 42, 44 [7th Cir. 1996]).[54] However, although manufacturer competition for retail shelf space is pervasive, it may not be obvious why this competition leads manufacturers to contract for shelf space rather than to merely set wholesale prices and let retailers unconditionally choose which products to stock and prominently display. Once we understand the economic forces underlying these contractual arrangements and the ultimate benefits achieved by consumers, slotting contracts are unlikely to be condemned as manufacturer attempts to anticompetitively exclude rivals or retailer attempts to earn monopoly rents but are likely to be accepted as part of the normal competitive process.

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[54] Other recent examples include the court's conclusion in *El Aquila Food Products v. Gruma* (301 F. Supp. 2d 612, 630, 632 [S.D. Tex. 200]) that although some rival tortilla manufacturers lost shelf space they enjoyed prior to Gruma's shelf space contracts, this was because they "refused to actively compete for shelf space," and consequently the plaintiffs suffered "a self-inflicted wound." Similarly, the court in *R. J. Reynolds Tobacco Co. v. Philip Morris, Inc.* (199 F. Supp. 2d 363, 382 [M.D.N.C. 2002]) described Philip Morris's payments to retailers for promotional display space as "competition at the pre-contract stage."

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