Chapter #

CATEGORY CAPTAINSHIP PRACTICES IN THE RETAIL INDUSTRY

Mümin Kurtuluş1 and L. Beril Toktay2
1Owen Graduate School of Management, Vanderbilt University, 401 21st Avenue South, Nashville, TN 37203; 2College of Management, Georgia Institute of Technology, 800 West Peachtree Street NW, Atlanta, GA 30308-0520

Abstract: Retailers in the consumer goods industry often rely on a leading manufacturer for category management, a form of manufacturer-retailer collaboration referred to as category captainship. There are reported success stories about category captainship, but also a growing debate about its potential for anti-competitive practices by category captains. The goal of this chapter is to provide an overview of the existing research on category captainship, and identify research directions that would improve our understanding of its impact.

Key words: Category management; category captainship; retailing; supply chain management

1. INTRODUCTION

A product category is defined as a group of products that consumers perceive to be interrelated and/or substitutable (Nielsen Marketing Research 1992). Soft drinks, oral care products, and frozen vegetables are some examples of retail categories. Categories can be viewed as the smallest strategic business unit within a retailer. Thus, retailers have refocused their efforts on managing entire product categories as a single business unit, a practice called category management. The goal is to improve business performance through focusing on delivering consumer value. In particular, retail category management involves decisions such as merchandizing product assortment, determining retail prices, and allocating shelfspace to each product on the basis of category goals. Unlike in the traditional
approach where retailers managed their product portfolio on a brand-by-
brand or SKU-by-SKU basis, category management emphasizes the
management of product categories as a whole and allows the retailers to
capture the synergies that may arise as a result of grouping the products
together. Various synergies such as promotion coordination, store traffic
driving strategies, and substitution patterns can be captured by grouping the
products together. However, category management requires that a lot of
resources be dedicated to understanding the consumer response to the
assortment, pricing and shelf placement decisions of products within a
category.

Recently, a new trend has emerged: Retailers have started to outsource
retail category management to a chosen supplier on whom they rely for
strategic recommendations and insights, a practice often referred to as
“category captainship.” The increase in the number of product categories
offered at the retailers, combined with the scarcity of the resources required
to manage each category effectively have contributed to this new trend. In a
typical category captainship arrangement, the retailer shares all relevant
information such as sales data, pricing, turnover, and shelf placement of the
brands with the category captain. The category captain, in return, performs
analysis about the category and provides the retailer with a detailed plan that
includes recommendations about which brands to include in the category,
where to locate each brand on the shelf, how to display the products, how
much space to allocate to each brand, which new brands to include and
which old brands to exclude from the category, and how to price the
products in the category. The retailer is free to accept or reject any of the
recommendations provided by the category captain.

Category captainship practices vary depending on the retailer, resulting in
a continuum of practices. At one end of the spectrum, some retailers
implement the category captain's recommendations as they are; at the other
end, some retailers filter the recommendations provided by the category
captain and verify their appropriateness before deciding on the
implementation (Steiner 2001). Retailers usually design the category
captainship contracts to be short term (one to two years at most) in order to
keep the flexibility of being able to renegotiate the contracts or rotate the
category captain (Hettrick 2005). In addition, category captainship contracts
usually include target levels for profit and sales to be achieved by the
category captains.

1.1 Category Captainship Implementations in Practice

Many retailers and manufacturers in the consumer goods industry
practice category captainship and report positive benefits. Retailers such as
Wal-Mart, Metro, Safeway, and Kroger practice category captainship in some of their product categories and usually assign manufacturers such as Kraft Foods, P&G, Kellogg and Danone to serve as category captains because of their established brands in the market and their resource availability. Below are some specific examples of category captainship implementations from practice.

Carrefour, the second largest retailer in the world, recently asked Colgate to serve as category captain in the oral care category. Based on a number of consumer studies, Colgate suggested that Carrefour restructure the display in the oral care category so as to merchandise toothbrush products above toothpaste products, as opposed to merchandising them next to each other. As a result of the restructuring, Carrefour reported 6-16% sales increase in the oral care categories in its retail markets. Colgate also benefited from this sales increase (ECR Conference 2004). The sales increase in the oral care category came at a little cost to the entire channel because Colgate mostly utilized its already existing consumer studies and its expertise in the oral care category. If Carrefour was to conduct the research necessary for such a restructuring, it would have been much more expensive.

Similarly, Ross Products serves as category captain for Safeway in the infant formula category (Progressive Grocer 2004). Safeway asked Ross Products to examine the category and prescribe solutions to improve the profitability of the category. Ross’ assessment of the category revealed that the category was under-merchandised: the infant formula subcategory was contributing 34% of the baby care category’s dollar volume, but was receiving only 11% of the shelfspace. Ross recommended some changes in shelfspace positioning, and also reviewed and revised the pricing to boost profitability. After implementing the recommendations, the category boasted 9.2% sales growth benefiting both Safeway and Ross Products (Progressive Grocer 2004). One could argue that Safeway could have developed a similar prescription to improve the performance in the infant formula category without using Ross Products as a category captain, however, the cost of doing so would have been much higher as Safeway does not have the expertise that Ross Products does.

General Mills serves as category captain for some of its retail partners in the Baking Ingredients and Mixes category (Progressive Grocer 2004). General Mills’ recommendations are focused around SKU rationalization and variety-vs-duplication analysis. SKU rationalization is aimed at reducing the number of SKUs to reduce consumer confusion at the shelf and thus create growth. Similarly, excessive duplication does not add much in incremental volume. Removing duplications allows for expanded product variety, which in turn can generate more sales in the category and help it grow. One of the retailers for which General Mills serves as category captain
has seen a 10.2% increase in base dollar volume since General Mills’ SKU rationalization efforts (Progressive Grocer 2004).

Although category captains are common in the grocery and consumer products industries, category captainship practices are making an appearance in apparel retailing as well. VF Corp., NC based manufacturer of brands such as Lee and Wrangler, serves as category captain for a number of its retail partners in the jeans category (Apparel Magazine 2005). VF Corp works with its retail partners to determine the product mix to be offered in each region, how products will be displayed on the sales floor, and how inventory levels will be managed in the category. Inspired by the success in the jeans category, VF Corp is looking forward to take on category captainship responsibility in other categories such as sports licensing and outdoor performance apparel categories.

These examples, and many other successful category captainship implementations, demonstrate that by working together, retailers can considerably benefit from their manufacturers’ expertise in managing their categories and deliver consumer value through supply chain collaboration. However, conflict of interest between the retailer and the category captain or between competing manufacturers could be an issue. First, what is in the best interest of the category captain may not be the best for the retailer. Second, the category captain may take advantage of its position and disadvantage competitor manufacturers. It is not surprising that there is an emerging debate on whether or not category captainship poses some antitrust challenges.

While there are many cases under investigation due to claims of antitrust practices, one publicly known and well-documented example where some antitrust issues have been important is the United States Tobacco Co. vs. Conwood Co. case. United States Tobacco Co. (UST), the biggest company in the smokeless-tobacco category, was recently condemned to pay a $1.05 billion antitrust award to Conwood, the second biggest competitor in the category (Greenberger 2003). Conwood had sued UST, the category captain, and had claimed that UST used its position as category captain to exclude competition and provide an advantage to its own brands. The court ruled that UST’s practices resulted in unlawful monopolization, harming competition, and consequently, the consumers. This example clearly illustrates that category captainship practices might have negative impact on both the non-captain manufacturers and end consumers. Monopolization in the category may result in lower variety and higher prices, which in turn may harm the consumers. Similarly, many other category captainship arrangements in the tortillas, cranberries, and carbonated soft drinks categories are before the court regarding category captainship misconduct (Desrochers et al. 2003).
To summarize, while many retailer-manufacturer dyads claim positive benefits from their category captainship implementations, there is also evidence concerning negative impacts of using category captains. Retailers planning to implement category captainship should develop an understanding of the pros and cons of such practices and should weigh potential advantages and disadvantages of using category captains for category management. The goal of this chapter is to provide an overview of the existing research on category captainship, and identify research directions that would improve our understanding of its impact.

The chapter is organized as follows. We start by reviewing the literature on category captainship in Section 2. In Section 3, we discuss the potential impact of category captainship practices on the retailing industry. Section 4 offers some future research directions.

2. REVIEW OF EXISTING RESEARCH ON CATEGORY CAPTAINSHIP

Despite a decade of implementation, there is limited academic research concerning category captainship. The existing research on category captainship can be grouped into four broad categories that aim to answer the following questions:

- Under what conditions will category captainship partnerships emerge in equilibrium?
- What is the impact of the retailer delegating the pricing decision to a category captain?
- What is the impact of the retailer delegating the assortment selection decision to a category captain? How should the retailer structure the manufacturer relationship for maximum benefit?
- What are the antitrust issues that may arise as a result of using category captains for category management? What can be done to avoid these antitrust issues?

The limited research in this field is due to some challenges such as the broad scope of category captainship implementations and continuum of category captainship implementations. In general, category captainship implementations include recommendations about retail category management decisions such as pricing, assortment, shelfspace management, promotions, etc. However, researchers usually focus on recommendations in only one of these areas, limiting their research and findings to a subset of category captainship implementations. In addition, while some retailers implement their category captain’s recommendations as they are, others use
them only after modifying the recommendations. Researchers usually focus on one end of this spectrum where the retailer implements the recommendations as they are and ignore all other possibilities. In section 4, we propose some avenues for future research that could potentially overcome these challenges and improve our understanding of category captainship practices.

In what follows, we will review the literature by describing their contributions to each of the questions in the above outline. Niraj and Narasimhan (2003), Wang et al. (2003), and Kurtuluş and Toktay (2005) all consider N ≥ 2 competing manufacturers that sell their differentiated products to consumers through a common retailer. All of these papers utilize linear downward sloping demand functions that are commonly used in marketing and economics. The demand for products when N = 2 is given by

\[ q_1 = a_1 - p_1 + \theta(p_2 - p_1) \quad q_2 = a_2 - p_2 + \theta(p_1 - p_2) \]  

(1)

where \( p_1 \) and \( p_2 \) are the retail prices of the two products and \( \theta \in [0,1] \) is the cross-price sensitivity.

The parameters in the demand system have the following interpretation: If the retail prices for both products are the same, the relative demand for each product is determined by the parameters \( a_1 \) and \( a_2 \). Therefore, the parameters \( a_1 \) and \( a_2 \) can be interpreted as the relative brand strength of each product. The parameter \( \theta \) is the cross-price sensitivity parameter that shows by how much the demand for product j increases as a function of a unit price increase in product i. The assumption \( \theta \in [0,1] \) implies that the products are substitutable. As \( \theta \) increases, the demand for product i, \( q_i \), becomes more sensitive to price changes of product j, \( p_j \). Therefore, we interpret the parameter \( \theta \) as being the degree of product differentiation; the higher the parameter \( \theta \), the less differentiated the products are.

This type of linear demand system is consistent with Shubik and Levitan (1980) and is widely used in marketing (McGuire and Staelin 1983, Choi 1991, Wang et al. 2003) and economics (Vives 1999, and references therein). The demand functions can be justified on the basis of an underlying consumer utility model: They are derived by assuming that consumers maximize the utility they obtain from consuming quantities \( q_1 \) and \( q_2 \) at prices \( p_1 \) and \( p_2 \), respectively. The utility representation is useful as it allows researchers to investigate how consumers are influenced by different pricing policies and different product assortments via a calculation of the consumer surplus.
2.1 Emergence of Category Captainship

Niraj and Narasimhan (2003) consider a model where two manufacturers (N=2) sell their differentiated products through a common retailer and define category management as an information sharing alliance between the retailer and all manufacturers in the category. Category captainship, on the other hand, is defined as an exclusive information sharing alliance between the retailer and only one manufacturer. The paper investigates whether or not such exclusive information sharing alliances would emerge in equilibrium, and if so under what conditions.

The paper assumes that $a_1=a_2=a$ and demand uncertainty is captured by a two-point distribution for the brand strength parameter $a$. The demand strength parameter $a$ is either high (H) or low (L) with probability $\lambda$ and $1-\lambda$, respectively. Both the retailer and the manufacturers observe private signals that carry information regarding the realization of the uncertain parameter. Information reduces uncertainty by reducing the conditional variance of the underlying random variable. The quality of information available to the partners in the supply chain is captured by parameter $R$, which the authors call reliability and which is characterized by the following conditional probabilities:

$$P(H | H) = P(L | L) = R \quad \text{and} \quad P(L | H) = P(H | L) = 1 - R$$

with $R \in (0,1]$.

The authors assume the two manufacturers to be symmetric and have a baseline reliability of $\mu$. The retailer’s baseline reliability is denoted by $\rho$. The authors also introduce the parameter $\sigma$ to capture the degree of complementarity of the information sources. The higher the complementarity parameter $\sigma$, the less valuable it is to form an alliance and combine information. There are three possible information sharing arrangements: (i) If both manufacturers decide to offer a partnership and the retailer accepts the partnership, then both manufacturers have reliabilities of $\mu + \sigma$ and the retailer’s reliability is $\rho + 2\sigma$; (ii) If only one manufacturer offers a partnership and the retailer accepts the partnership, then one of the manufacturer’s reliability remains at $\mu$, the reliability of the manufacturer offering the partnership increases to $\mu + \sigma$ and the retailer’s reliability becomes $\rho + \sigma$; (iii) If the retailer does not accept the partnership proposal, all firms remain at the baseline level of reliabilities.

Formation of an information sharing alliance increases (i) the total channel profit; and (ii) the reliability of information available to the party participating in the alliance. While participation in an information sharing alliance leads to more reliable information regarding the market (parameter
a), it also increases the other firm’s reliability which makes it more difficult for the information-sharing party to appropriate a bigger share of the total channel profit.

The sequence of events is as follows. First, the manufacturers, independently and simultaneously, offer an information sharing alliance. Neither, one or both manufacturers may propose an alliance and the retailer can accept or reject any of the proposed alliances. Second, the manufacturers and the retailer play a pricing game where the manufacturers act as a Stackelberg leader and set their wholesale prices simultaneously and then the retailer sets the retail prices.

The game is solved backwards. First, the authors solve the pricing game that takes place between the manufacturers and the retailer for given levels of reliabilities. The retailer sets retail prices for given reliability and wholesale prices by maximizing its total expected category profit

$$\Pi_r = E[(p_1 - w_1)q_1 + (p_2 - w_2)q_2]$$

where the expectation is over the true state of the world, the retailer’s signal, and the signals received by both manufacturers. Then, expecting the retailer’s pricing responses, the manufacturers set wholesale prices by maximizing their respective profits. Manufacturer i’s profit is

$$\Pi_i(w_i, w_j) = E[q_i(w_i, w_j)]$$

for i = 1, 2 and i ≠ j,

where the expectation is over the true state of the world, the retailer’s signal and manufacturers’ signals. It is also assumed that the manufacturers’ production costs are zero. Second, after determining the wholesale and retail prices for given levels of reliabilities, the supply chain partners decide on whether to form an information sharing alliance or not. The manufacturers’ information sharing decision will be based on a comparison of their expected profits in all possible scenarios. Similarly, the retailer’s acceptance or rejection decision is based on a comparison of its expected profit in the baseline scenario, and the non-exclusive and exclusive information sharing alliance scenarios.

It turns out that the main determinant of whether or not an information sharing alliance will be formed is the reliability of information available to each player in the supply chain. First, unless both the retailer’s and the manufacturers’ reliabilities are very high, at least one of the manufacturers will offer an information sharing alliance. Second, the retailer accepts any proposed alliance when the reliability of information available to the retailer is higher than the reliability of the information available to the manufacturers. Third, category captainship type of exclusive information
sharing alliances will emerge when the reliability of information available to the retailer is high and the reliability of information available to the manufacturers is at intermediate levels.

The intuition behind this result is as follows: We already said that when the reliability of information available to the retailer and both manufacturers is very high, none of the manufacturers will offer an information sharing alliance. However, as the reliability of information available to the manufacturers decreases, it becomes feasible for one of the manufacturers to offer an information sharing alliance. As the reliability of the information available to the manufacturers decreases further, it becomes profitable for both manufacturers to offer an information sharing alliance. The retailer accepts a proposed alliance if and only if the retailer’s potential gain from an increase in reliability outweighs the potential harm of increased reliability at the manufacturers. The authors argue that their results potentially explain why more sophisticated retailers such as Wal-Mart, who are likely to have higher reliability of information, entered into category management and category captainship type of information sharing alliances before other retailers.

2.2 Delegation of the Pricing Decisions

The idea of an upstream party in a supply chain (such as a manufacturer) interfering with the retailer’s pricing decisions is not new. There is a large amount of research in economics on so-called Resale Price Maintenance (RPM) practices where a manufacturer imposes a minimum or a maximum resale price to the retailers (e.g., Gilligan 1986, Overstreet 1983 and references therein). Research on RPM has mainly focused on explaining the use of RPM practices. The most intuitive explanation is that manufacturers would use RPM and would limit retailers’ flexibility in setting their retail prices optimally because there would be too much price competition between the retailers otherwise.

However, there are other alternative explanations. The traditional view has been that RPM can be used to prevent retailers from “free-riding” in providing services (Telser 1960). While one retailer may offer a service in how to use the product, another retailer might benefit or free ride by selling to a customer who has already learned about how to use the product from the other retailer. A more recent explanation offered by Deneckere et al. (1996) is that RPM can be used to respond optimally to demand uncertainty and to encourage retailers to hold inventories. Nevertheless, the literature remains inconclusive regarding the impact of RPM practices on consumer welfare;
while some research indicate that RPM practices enhance consumer welfare, others indicate the opposite (Ippolito and Overstreet 1996).

While the RPM and category captainship practices are similar in the sense that the manufacturer interferes with retailers’ pricing decisions, there are also significant differences between the two. While RPM practices are manufacturer driven, category captainship practices are mostly retailer driven. In addition, while with RPM, the manufacturer imposes a retail price on its own products only, in category captainship, the manufacturer might recommend retail prices for all products in the category. In order to investigate the impact on stakeholders and consumer welfare, the RPM literature generally utilizes models where a single manufacturer sells to consumers through multiple competing retailers (e.g., Chen 1999 and Deneckere et al. 1996). On the other hand, the category captainship literature generally utilizes models where multiple manufacturers sell their products to the consumers through a common retailer (e.g., Wang et al. 2003 and Kurtuluş and Toktay 2005).

To summarize, while the RPM practices and category captainship practices differ significantly, the main research questions are similar: Both streams of literature aim to provide justification for use of these practices by investigating the impact on involved parties and consumer welfare.

Wang et al. (2003) and Kurtuluş and Toktay (2005) take the category captainship decision as given and consider how each stakeholder in the supply chain is affected when the retailer delegates the pricing decisions to one of its leading manufacturers.

Wang et al. (2003) consider a game theoretic model with N manufacturers that sell their products through a common retailer and investigate whether it is profitable for the retailer to delegate pricing authority to a category captain. The demand model used in Wang et al. is a generalized and slightly modified version of the demand system described in (1). The demand for product i is given by

$$q_i = \frac{1}{N} \left[ a - p_i + \frac{1}{N-1} \sum_{i \neq j} \theta(p_i - p_j) \right]$$

In the absence of a category captain, the manufacturers act as Stackelberg leaders and offer wholesale prices $(w_1, w_2, \ldots, w_N)$ to the retailer at stage one of the game. Then at stage two, given the wholesale prices, the retailer sets the retail prices to maximize total category profit

$$\max_{p_1, \ldots, p_N} \sum_{i=1}^{N} (p_i - w_i)q_i.$$
The game is solved through backward induction. First, the retailer solves the above optimization problem for given wholesale prices and determines the quantity responses and then each manufacturer sets its own wholesale price in expectation of the quantity demanded of its own product, \( \hat{q}_i(w_1, \ldots, w_N) \), to maximize profit. The production costs are assumed to be zero for all the products. At stage one of the game, each manufacturer solves

\[
\max_{w_i} w_i \hat{q}_i(w_1, \ldots, w_N).
\]

The paper assumes, without loss of generality, that the manufacturer with index one (the first manufacturer) is the category captain. Category captainship is modeled as being an alliance between the retailer and the manufacturer of the first brand. In other words, under category captainship, the retailer and the category captain act as an integrated firm. In this model, after the N-1 manufacturers offer their wholesale prices \( (w_2, w_3, \ldots, w_N) \) the alliance (where the category captain and the retailer act as an integrated firm) sets the retail prices to maximize the alliance profit

\[
\max_{p_1, \ldots, p_N} p_1q_1 + \sum_{i=2}^{N} (p_i - w_i)q_i.
\]

Then, given the quantity responses \( \hat{q}_i(w_2, \ldots, w_N) \), \( i \geq 2 \), the manufacturers set their wholesale prices.

The main result in Wang et al. (2003) is that using a category captain for category management is profitable for both the retailer and the category captain. The intuition is as follows: After the retailer and the category captain form an alliance, the alliance will gain from the category captain’s brand (i.e., coordination between the retailer and the captain) and will lose from selling other brands in the category. It turns out that both the channel coordination effect and the competition effect have a positive impact on the joint profit gain, therefore benefiting both the retailer and the category captain. On the other hand, category captainship generally does not benefit the non-captain manufacturers due to increased pressure from the channel. Furthermore, the paper also identifies conditions under which category captainship can benefit all participating partners. Category captainship may benefit all parties in the supply chain if (i) the category captain has the authority to choose the retail price for its own brand only (i.e., partial delegation); and (ii) the non-caption manufacturer behaves strategically (i.e., adjusts its own wholesale price to the use of a category captain in the supply chain).
In addition, the paper identifies conditions under which category captainship is more beneficial for the alliance members. The paper finds that the profitability of using a category captain is higher if the product category (1) has fewer products (lower N); (2) has higher price competition among products (higher cross-price sensitivity $\theta$) and (3) has no store brand as opposed to having a store brand. The inclusion of a store brand modifies the demand system slightly and therefore the alliance profit. When there is a store brand, the alliance sets the retail prices to maximize the alliance profit

$$\max_{p_1,\ldots,p_N} p_1 q_i + \sum_{i=2}^{N} (p_i - w_i)q_i + p_s q_s,$$

where $q_s$ and $p_s$ are the demand and price for the store brand and $q_i$ and $q_s$ are given by

$$q_i = \frac{1}{N+1} \left[ a - p_i + \frac{1}{N} \sum_{i=2}^{N} \left( \theta(p_i - p_s) + \delta(p_s - p_i) \right) \right]$$

for $i = 1,\ldots,N$

$$q_s = \frac{1}{N+1} \left[ a - p_s + \frac{1}{N} \sum_{i=2}^{N} \delta(p_i - p_s) \right].$$

The parameter $\delta$ in the above equations is the cross-price sensitivity between the manufacturers’ brands and the store brand.

The model also offers some insights as to which manufacturer should be selected as a category captain. The ideal category captain is the manufacturer who has a higher brand strength (i.e., higher $a$) and a higher cross-price sensitivity. This finding is in line with the current practice where retailers assign their leading manufacturers as category captains.

The proliferation of product variety in conjunction with the relative scarcity of retail shelfspace has resulted in intensified manufacturer competition. As reported in Quelch and Kenny (1994), the number of products in the consumer goods industry increased by 16% per year between 1985 and 1992 while shelfspace increased by only 1.5% per year during the same period. To capture this effect, Kurtuluş and Toktay (2005) consider two manufacturers who sell through a common shelfspace-constrained retailer. Category captainship is modeled as the delegation of pricing authority to a leading manufacturer, as in Wang et al. (2003).

The shelfspace constraint, $S$, imposes that $q_1 + q_2 \leq S$. In their model, $q_1$ and $q_2$ can be viewed as demand rates for each product per replenishment period; the retailer prices the products so that the total demand rate does not exceed the shelfspace availability. Another interpretation would be to view
q₁ and q₂ as the long-term volumes to be purchased and sold subject to a total volume target for the category.

The paper considers two scenarios that represent traditional retail category management and category captainship. In the first scenario, the retailer is responsible for managing the category and determines retail prices (and shelfspace allocations). The manufacturers, on the other hand, compete for the limited shelfspace at the retailer. First, given the wholesale prices, the retailer solves the following optimization problem:

\[
\max_{\pi_1, \pi_2} (p_1 - w_1)q_1 + (p_2 - w_2)q_2 \\
\text{s.t.} \quad q_1 + q_2 \leq S \\
\qquad \quad q_1 \geq 0, q_2 \geq 0
\]

The authors fully characterize the quantity responses \( \hat{q}_1(w_1, w_2) \) and \( \hat{q}_2(w_1, w_2) \), which are the optimal quantities determined in the above optimization problem for given wholesale prices \((w_1, w_2)\).

Then, anticipating the retailer’s response functions \( \hat{q}_1(w_1, w_2) \) and \( \hat{q}_2(w_1, w_2) \), the manufacturers play a simultaneous move wholesale price game. Each manufacturer maximizes

\[
\Pi_i(w_i, w_j) = (w_i - c_i)\hat{q}_i(w_i, w_j) \quad \text{for } i, j = 1, 2 \text{ and } i \neq j,
\]

where \( c_i \) is manufacturer \( i \)’s production cost.

In the second scenario called “category captainship”, the authors assume that the retailer delegates pricing decisions to one of its manufacturers and implements the recommendations as they are in return for a target category profit \( K \). First, for given \((w_2, S, K)\), the authors solve the following optimization problem faced by the category captain:

\[
\max_{\pi_1, \pi_2} (w_1 - c_1)q_1 \\
\text{s.t.} \quad (p_1 - w_1)q_1 + (p_2 - w_2)q_2 \geq K \\
\qquad \quad q_1 + q_2 \leq S \\
\qquad \quad q_1 \geq 0, q_2 \geq 0
\]

Note that under category captainship, the category captain sets prices to maximize its own profit but has to deliver a target profit to the retailer. The authors characterize the quantity responses \( \hat{q}_1(w_2) \) and \( \hat{q}_2(w_2) \) for all possible \( w_2 \). Then, the non-captain manufacturer sets its wholesale price \( w_2 \) in expectation of \( \hat{q}_2(w_2) \) by maximizing its profit \((w_2 - c_2)\hat{q}_2(w_2)\).
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The results in Kurtuluş and Toktay (2005) are based on a comparison of the two scenarios described above. The main insight of the paper is that given the limited shelfspace at the retailer, category captainship practices may result in competitive exclusion. Competitive exclusion refers to the phenomenon where the category captain takes advantage of its position to advantage its own brand and disadvantage competitors’ products. Their results suggest that in some cases, the category captain would indeed prefer to go so far as to exclude the non-captain manufacturer’s brand from the category. The UST vs. Conwood case is a good example of a high level of competitive exclusion. In practice, competitive exclusion may take many different forms, most of them less extreme than completely excluding competitors. For example, displaying the non-captain manufacturers’ brands at the bottom of the shelf, or promoting the non-captain manufacturers’ brands at a less desirable time are some less obvious forms of competitive exclusion.

According to this paper, competitive exclusion is more likely to occur when the difference, in terms of market share, between the manufacturers is large. For example, this result suggests that if Coca Cola is assigned as category captain in the soft drinks category, Coca Cola would prefer excluding a manufacturer with a small brand from the category rather than excluding a bigger manufacturer such as Pepsi. The intuition is as follows: the target profit level set by the retailer would allow Coca Cola to deliver the target profit level without a small brand in the category; however, Coca Cola cannot meet the target profit level if it excludes a bigger manufacturer such as Pepsi.

Setting a target profit level for the category partially prevents the category captain from excluding the non-captain manufacturers, but competitive exclusion cannot be prevented completely in this manner. A natural question to ask is: What measures can the retailer take to avoid competitive exclusion? One obvious solution would be for the retailer to mandate that the category captain not exclude any of the brands in the category. However, as we mentioned already, exclusion may take many different and non-obvious forms, which may make it difficult for the retailer to monitor the exclusion of the non-captain brands from the category. A second measure is for the retailer to filter the category captain’s recommendations before implementing them. This would avoid the more blatant forms of exclusion. Of course, for the same reason as before, it may not be easy for the retailer to detect biased recommendations when they are subtle.
2.3 Delegation of the Assortment Selection Decision

In both Wang et al. (2003) and Kurtuluş and Toktay (2005), the retailer delegates the pricing authority to a leading manufacturer. However, in practice, the scope of category captainship is broader than making price recommendations. Retailers usually rely on their category captains for assortment recommendations as well. Kurtuluş and Toktay (2006) consider a model where the retailer delegates the assortment selection decision in the category to a leading manufacturer. The goal of this research is to answer how the assortment offered to the consumers at the retailers will change if category captainship is implemented and how the retailer can benefit the most from its category captains for assortment recommendations.

There is an emerging literature on retail assortment planning where the main focus is on retailer’s optimal assortment selection (Kök et al. 2006). Kurtuluş and Toktay (2006) contribute to this emerging stream by investigating how retail assortment under category captainship may differ from that under retail category management. The authors extend some of the results proposed in van Ryzin and Mahajan (1999) and show that these results could be maintained under some conditions even if the assortment decision is delegated to the category captain.

The paper considers a two-stage supply chain with multiple manufacturers that produce differentiated products and sell their products to the consumers through a common retailer. The paper uses the multinomial logit (MNL) consumer choice model (see van Ryzin and Mahajan 1999 and Cachon et al. 2005). Let \( N = \{1, 2, \ldots, n\} \) denote the set of manufacturers. Let \( S \subseteq N \) denote the subset of variants that retailer decides to include in the retail assortment. A customer either purchases one of the variants in \( S \) or does not purchase anything. Let variant 0 represent the no-purchase option of the customers.

Let \( U_i = (u_i - r_i) + \xi_i \) denote the utility that a consumer gets from variant \( i \). The parameter \( u_i \) can be interpreted as consumers reservation price of buying variant \( i \) and \( r_i \) is the retail price of variant \( i \). Then, the term \( u_i - r_i \) is consumers’ expected net utility from variant \( i \). The paper assumes that the variants are labeled in decreasing net utility order: \( u_i - r_i \geq u_j - r_j \) for all \( i < j \). The term \( \xi_i \) is a mean-zero Gumbel-distributed error term that creates consumer heterogeneity. It is also assumed that \( \xi_i \)’s are independent across end products. (See Kök et al. 2006 for an excellent review and discussion of MNL models in the operations literature).

Given the choice set \( S \) and the no-purchase option 0, a consumer buys the option with the highest utility. Let \( q_i(S) = P[U_i = \max\{U_j : j \in S \cup \{0\}\}] \) denote the probability that variant \( i \) has the maximum utility given that the customer is offered assortment \( S \). Similarly, \( q_0(S) \) is the probability that an
incoming customer selects the no-purchase option. The probability $q_i(S)$ is given by

$$q_i(S) = \frac{v_i}{v_0 + \sum_{i \in S} v_i}$$

where $v_i = e^{(u_i - v_i)/\mu}$ is interpreted as the population’s preference for item $i \in S$. Let also $\lambda$ denote the rate of customers entering the store. The demand for variant $i$ is given by $\lambda q_i(S)$.

First, the paper considers a model where the retailer is responsible for selecting the retail assortment. The manufacturers offer their wholesale prices and in response, the retailer decides which items to include in the retail assortment. The retailer’s objective is to select $S$ to maximize the expected profit

$$\sum_{S \subseteq N} [m_i \lambda q_i(S) - \sigma(q_i(S))],$$

where $m_i$ is the retailer’s margin for product $i$, and $\sigma(.)$ is the operational cost associated with including variant $i$ in the retailer’s assortment. The authors assume that $\sigma(.)$ is increasing and concave. Both Cachon et al. 2005 and van Ryzin and Mahajan 1999 assume similar cost structures.

Second, the paper considers a model where the retailer delegates the assortment selection decision to a leading manufacturer using various strategies such as target profit, target sales and target variety. Setting target profit and target sales levels in a category is quite common in practice. The retailer delegates the assortment decision to the category captain because the category captain can invest in activities such as promotion planning, traffic driving strategies or consumer education that would potentially increase the rate of customers purchasing from the category. This way, the retailer can benefit from the category captain’s expertise. To capture the category captain’s expertise and superior knowledge about consumers, the authors assume that the category captain increases the rate of customers who would potentially shop in the category and denote this increase by $\Lambda$.

The category captain’s problem is
where $K$ is the target profit (TP) level, $\theta$ is the target sales (TS) level, and $\bar{b}$ is the target variety (TV) level. The category captain maximizes its profit subject to one of the three constraints.

The paper compares the performance of the three different strategies in delegating the assortment selection decisions. The main insight from the paper is that when the retailer has the power to offer a take-it-or-leave-it contract to the category captain, with target profit and target sales level contracts, the structure of the recommended assortment may be the same as the structure of the optimal assortment under retail category management. In plain words, this result implies that when the retailer is more powerful, the assortment offered to the consumers under retail category management would not be that different than the recommended assortment under category captainship. On the other hand, with a target variety level contract, the structure of the recommended assortment differs from the optimal assortment under retail category management. Therefore, it is not surprising that many retailers rely on their manufacturers for recommendations on assortment planning by setting profitability and sales volume levels in the categories.

Conversely, if the category captain has the power to offer a take-it-or-leave-it contract, the structure of the recommended assortment, with all three contracts, is usually not the same as the structure of the optimal assortment under retail category management and the variety offered to the consumers is lower as a result of which consumer surplus may decrease. In plain words, this result implies that if the category captain is more powerful, the assortment offered to the consumers under retail category management would not be the same as the recommended assortment under category captainship.

To summarize, Kurtuluş and Toktay (2006) suggest that retailers should consider implementing category captainship in categories where they are more powerful than their category captains so that they can properly align...
the incentives of their category captains by either target profit or target sales level contracts and benefit from category captain’s resources.

2.4 Antitrust Concerns

Recently, some economists have voiced antitrust concerns related to category captainship (Steiner 2001, Desrochers et al. 2003, Leary 2003, Klein and Wright 2006). In the US, the Antitrust Institute has voiced reservations about category captainship. In Europe, ECR has taken the lead to ensure that category captainship is implemented in compliance with European Union competition rules.

Desrochers et al. (2003) states that antitrust concerns related to category captainship practices focus around two issues: (1) competitive exclusion and (2) competitive collusion. Kurtuluş and Toktay (2005) contribute to the ongoing debate by offering theoretical support for the existence of competitive exclusion. They suggest some ways to avoid competitive exclusion such as assigning a non-leader manufacturer as a category captain.

Another exclusion-based concern is that smaller competitors are denied the right to compete for category captainship because they do not have the necessary resources (Desrochers et al. 2003). Retailers usually assign one of their leading manufacturers to serve as a category captain because only those manufacturers have the necessary resources that can benefit the retailer. Big manufacturers already invest a great deal in consumer research and can use these resources toward helping retailers manage their categories better. The concern is that category captain manufacturers’ power will be further enhanced and smaller manufacturers will be put at a disadvantage.

Competitive collusion concerns include the possibility that a category captain can use its role to facilitate collusion and limit the competition among rivals in the category (Desrochers et al. 2003). First, the category captain may transfer sensitive information such as pricing, merchandising, and promotion plans from one manufacturer to another. When manufacturers in the category know about their rivals’ pricing, they might price more or less aggressively, or if they know about their rivals’ promotion plans, they may promote their brands more selectively. Second, the category captain can coordinate its recommendations across the retailers for which it serves as category captain. Desrochers et al. suggest that if retailers are more selective in sharing sensitive data with their category captains, some forms of competitive collusion scenarios can be avoided.

To summarize, while category captainship practices in the retailing sector present a very valuable opportunity for the retailers to benefit from their category captain manufacturers’ expertise and resources, these practices also open up an opportunity for the category captain manufacturers to take
advantage of their positions as category captains and exclude competitors and restrict competition in the categories. While research shows that category captainship may have significant positive impact on retailer’s and category captain’s performances, economists (Desrochers et al. 2003) also point out to some of the controversial issues surrounding category captainship practices and claim that these practices might harm the consumers.

3. IMPACT OF CATEGORY CAPTAINSHIP PRACTICES ON THE RETAIL INDUSTRY

In this section, we consider how category captainship practices could potentially change the nature of the manufacturer-retailer relationships and the landscape in the retail industry.

Practices such as category captainship delegate considerable power to the category captain manufacturers because in most cases they can effectively control outcomes in the category (Desrochers et al. 2003). While some retailers continue to work with their category captains and verify their recommendations, other retailers prefer to implement their category captain’s recommendations due to lack of resources. While private information on the category captain’s part makes it easier for the category captain to provide biased recommendations and control the outcomes in the category, it also makes it more difficult for the retailers to detect category captain’s biased recommendations. Category captain’s influence over the retailer also depends on the size of the retailer. Small retailers are more likely to accept and implement the category captain’s exact recommendations, whereas larger retailers have more control over the process and are more likely to implement their category captain’s recommendations after verifying them.

In order to decrease the amount of control given to the category captains, some retailers assign a second manufacturer in the category to serve as co-captains and use them as consultants to verify the category captain’s recommendations. For example, Best Buy has assigned Warner Home Video to be the category captain in the DVD category, however, recently Best Buy announced that they will no longer use a solo captain but assign several advisers to work on category management recommendations (Hettrick 2005). In addition, the retailers keep the option to renegotiate the category captainship contracts quite frequently by offering short term contracts which do not bind the retailers to any specific period of time (Hettrick 2005). For example, until recently Warner Home Video, the market share leader in the DVD category, served as a category captain to Wal-Mart. However, recently
Wal-Mart decided (for unknown reasons) to downgrade Warner and assign a new category captain in the DVD category (Hettrick 2005). The short term nature of the category captainship agreements in a sense aims to balance the power in the supply chain by preventing the category captains from gaining too much power and dominating the retailers.

A potential adverse effect of category captainship on retailers is the loss of capability to manage the categories internally. Retailers should be aware that category management requires a thorough understanding of consumer preferences and purchase patterns, a knowledge base that is hard to build once that expertise is lost.

Traditionally, manufacturers such as Procter&Gamble and Unilever were the main players in the consumer goods industry and retailers were primarily a means of reaching consumers. The early nineties saw an increase in the number of high quality new product introductions and the emergence of other strong manufacturers, which led to higher competition for shelfspace. This, combined with the retailers’ awareness of the importance to be in contact with end consumers, provided the basis for a shift in power from manufacturers to retailers. Many retailers such as Wal-Mart, Carrefour, and Metro owe their rapid growth to these developments (Corstjens and Corstjens 1995).

As Corstjens and Corstjens describe in their influential book Store Wars, “...the giant retailers, now, stand as an obstacle between the manufacturers and the end consumers, about as welcome as a row of high-rise hotels between the manufacturer’s villa and the beach.” Their book describes the contemporary national brand manufacturers over the past decade as being in a continuous battle for shelfspace and mindspace at the retailers. It is therefore no surprise that manufacturers would advocate any initiative that can increase their influence over retail decisions, and category captainship is such a practice. But by outsourcing retail category management to their leading manufacturers, retailers may in the long-run lose their capabilities in managing their product categories and their knowledge about consumers. This loss of capability may prepare the basis for a shift in power back from the retailers to the manufacturers.

Given this changing landscape in the consumer goods supply chains over the past few decades, an intriguing question is what will happen to the retailer-manufacturer relationships and power balance in the consumer goods supply chains in the near future. With the growing popularity of category captainship practices in the retail industry, the number of manufacturer-retailer partnerships (e.g., Wal-Mart and P&G, Carrefour and Colgate) is increasing. While such partnerships will positively influence the partner manufacturers, they will also place the non-partnering manufacturers at a great disadvantage, forcing them to become a partner to a leading retailer.
Manufacturers’ battle for shelfspace and mindspace over the past decade has started to transform into a battle for being a partner (category captain) for a major retailer.

4. FUTURE RESEARCH DIRECTIONS

Although category captainship practices became quite prevalent in the retail industry over the past decade, the consequences of using category captains for category management are not fully understood by either academics or practitioners. Therefore, we believe that there is room for more original research in this field. We have identified five directions for future research that would help both academics and practitioners to better understand the consequences of category captainship practices.

First, existing research on category captainship assumes that the retailers either delegate the pricing or the assortment decision to a leading manufacturer. However, in practice, the scope of category captainship implementations is broader: retailers rely on their leading manufacturers for pricing, assortment, shelfspace management, promotions etc. Therefore, exiting models cannot fully capture the category captainship phenomenon. The question of how different category captainship arrangements impact the retailer and the manufacturers needs to be answered when the retailer relies on its category captain for a combination of assortment, pricing, shelfspace management and promotion planning recommendations.

New research can take advantage of the existing literature on joint inventory and pricing decisions in operations (see Petruzzi and Dada 1999, Elmaghraby and Keskinocak 2003, and Yano and Gilbert 2003 for literature reviews on different aspects of the joint pricing and inventory decisions) that could be used as the basis for investigating the impact of jointly delegating the shelfspace allocation and pricing decisions to a leading manufacturer. In addition, there is a literature on trade promotions in marketing (e.g., Lal and Villas-Boas 1998 and Kim and Staelin 1999) and operations (e.g., Iyer and Ye 2000 and Huchzermeier et al. 2002) that could be used as the basis for research to understand the impact of recommendations made by category captains to their retailers about different aspects of promotion planning.

We believe that specific aspects of category captainship practices could be investigated through mathematical models, but answering broader questions needs empirical research. In particular, empirically testing the impact of category captainship practices on the financial performance of the retailers and understanding when such practices would benefit the retailers would be a good starting point. Empirical research is also needed to test the hypothesis that category captainship may result in competitive exclusion.
Such empirical research would provide a basis for the antitrust cases that are under investigation regarding category captainship misconduct.

Second, existing research on category captainship exclusively focuses on categories where products are substitutes. However, a product category sometimes can consist of complementary products such as toothpaste and toothbrush products in the oral care category. Future research should be conducted to understand the differences in category captainship implementations where the products are substitutes versus complements, and whether categories where the retailer offers complementary products are more suitable for category captainship. Wang (2006) views complementary products as a set of different components from which a final product is assembled. Future research can take advantage of the existing research (e.g., Gerchak and Wang 2004, Bernstein and DeCroix 2004, and Wang and Gerchak 2003) on contracting and coordination of such assembly systems.

Third, all of the existing models assume that the information available to the retailer and the suppliers is the same. However, in practice, the basis for category captainship relationships is the fact that the category captain often has better knowledge about some aspect of the category than the retailer does. While retailers deal with as many as hundreds of categories, a typical manufacturer usually focuses on only a few. Therefore, it would be appropriate to assume that the category captain has private information about some parameters. For example, the category captain may have better information about the cross price sensitivities, which would allow him to make more accurate pricing decisions. Including asymmetric information in the models would also change the dynamics in that the retailer may be at a disadvantage to evaluate the recommendations provided by the category captain. Existing research concludes that category captainship benefits both the retailer and the category captain. However, this result may change when the category captain has private information. Characterizing the conditions under which the retailer benefits from category captainship under asymmetric information would therefore be another fruitful avenue for research.

Fourth, future research should explore the value of having an independent third party providing category management services for retailers. Companies such as ACNielsen collect and sell syndicated data and software that can be used for category management; however, they do not provide category management recommendations. Research is needed to understand the advantages and disadvantages of using a third party for category captainship. On one hand, retailers could take advantage of the expertise and resources of the third party providers without worrying about bias in the information provided. On the other hand, the retailers should be concerned about losing their internal category management capabilities.
Another source of concern for the retailers is that these third party providers would provide recommendations to many retailers that compete for the same consumers, potentially causing the retailer to lose its competitive edge.

Finally and related to the last point above, information leakages and competitive collusion are other areas that need further research. Category captainship requires that the retailer share a lot of strategic information with its category captain. In practice, a leading manufacturer serves as a category captain for many retailers that are competing for the same consumers. A potential danger that a retailer sharing strategic information faces is the leakage of strategic information to other competing retailers. The tradeoff that retailers face is the benefit from category captainship versus the potential problems and loss of competitiveness that could arise from information leakage. Research to identify under what market conditions, and retailer and manufacturer characteristics these concerns are overcome by the benefits of category captainship would be valuable.

REFERENCES


