

Chapter 2

Promotions and Collaboration in Retailing

Promotions and collaboration are prevalent tools in the German retail environment which aim at increasing profit margins: while promotions are used to increase sales and market share, collaboration with supply chain partners is intended to increase supply chain efficiency and hence to decrease cost. In this chapter, we begin by providing an overview of the key challenges in the German market situation. The subsequent sections show how retailers employ promotions and collaboration to respond to the highly competitive market environment.

2.1 The German Market Situation

The German retail market is the most important market in Europe and the third largest in the world (Metro Group 2006). It is a highly competitive environment characterized by declining sales volumes, a strong presence of discounters and a high share of private labels. As a response, the sales volume has been declining for most categories between 2002 and 2005. Figure 2.1 provides an overview on the percentage change in sales volumes for four key categories. Only the category sanitary paper increased by 3.9%, whereas the other three categories decreased between 0.6% for food and beverage and 11.8% for diapers.

The decrease of average sales volume is related to the weak German economy: modest economic growth and a high unemployment rate induced low consumer confidence. The share of retail spending as part of private consumption decreased from over 40% in the early 1990s to below 30% in 2005 (Metro Group 2006). Combined with an increasing price awareness following the introduction of the Euro, the result is an even stronger focus on prices by the customers (Harms 2004, p. 23).

Discounters in Germany have a strong market position ever since and are steadily and consistently gaining market share in Germany. Already in 2005, discounters represented 40% of the German market and outgrew the supermarket and hypermarket formats (Metro Group 2006, p. 21). Obviously, price is the dominant factor for the success of discounters. However, this success is built on more than cheap prices. For example, discounters provide lean structures: they are located close to where the customer lives and offer a simple and transparent product choice. Discounters

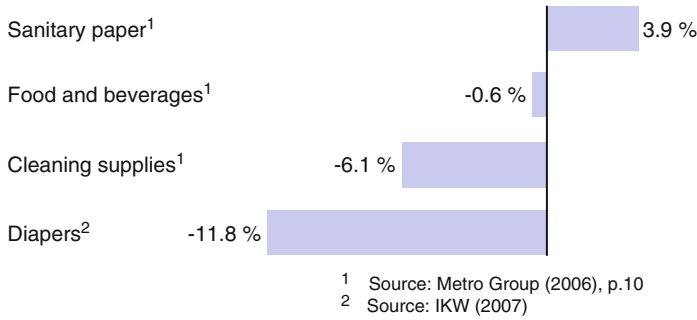


Fig. 2.1 Development of consumer goods categories in Germany: sales volume 2002–2005

thereby enable easy and economical shopping, which is a perfect combination for the budget-conscious customer with no time. Further, discounters have used their brands effectively to overcome the perceived contradiction between low price and high quality, and have succeeded in building trust and a reputation: Aldi is now one of the top brands recalled by German children just behind Lego and Smarties, but ahead of Barbie and Disney (Polman 2004).

It is not only the discounters that are growing but also the private label market. While some years ago private labels were primarily used by branded goods manufacturers to fill up excessive capacity, they have recently become the driver for manufacturers' sales growth. Compared to their branded counterparts, private labels have grown stronger in nearly two thirds of the products studied (Nielsen 2003).

Figure 2.2 depicts the share of discounters and private label brands in Germany in a European context, emphasizing the competitive environment of the German retail market already in 2005. If we consider this in the light of declining sales volumes, it becomes evident that retailers and branded good manufacturers are all chasing a bigger piece of a smaller pie. With the recent market entries of German discounters to other European countries (Schulz 2009), the competitive situation in these countries is comparable to the German situation several years ago.

The question is: how do branded goods manufacturers and retailers compete in this environment? They respond by promotions which puts further pressure on the profit margins. Hence a highly efficient supply chain is required which is achieved by means of collaboration. We shall review both promotion and collaboration and their effects in the following section.

2.2 Promotions

Promotions have become an ubiquitous element of traditional food retailers in order to compete in the German retail environment (Simon and Fassnacht 2009, p. 497). Both retailers and branded good manufacturers use promotions to regain market shares from discounters and private labels.

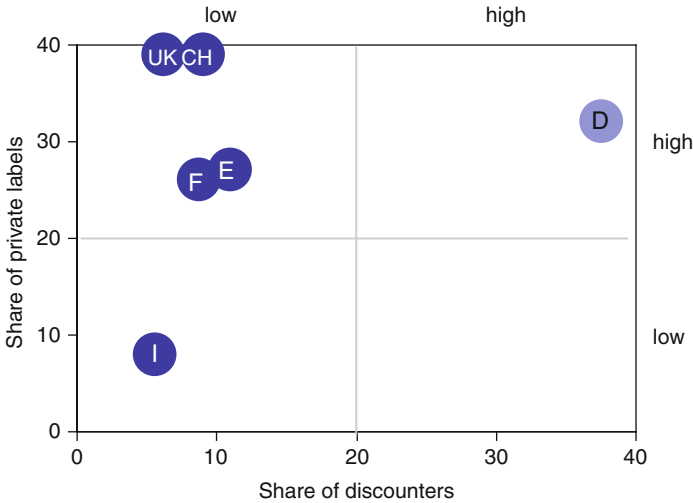


Fig. 2.2 Market share of discounters and private labels in food retailing, 2002 in percent. Source: own illustration based on Metro Group (2006)

Obviously, promotions are an important part of retailers’ strategies. We shall first define promotions and consider their impact. Thereafter, different pricing strategies prevalent in the German retail environment are characterized.

2.2.1 Definition and Impact of Promotions

Promotional pricing refers to an instance where pricing is the key element of the marketing mix – product, price, place and promotion. Bunn and Banks (2004) define promotions as “a range of tactical marketing techniques designed within a strategic framework to add value in order to achieve specific sales and marketing objectives”.

According to Blattberg and Neslin (1990), one can distinguish two major types of promotions. These are firstly customer promotions, which aim at the final customers. Customer promotions can either be offered by the retailer in the form of a price cut, feature or display, or by the manufacturer in the form of couponing or special packs (Simon and Fassnacht 2009, p. 496). The second type is trade promotions, which are offered by the manufacturer to the retailer.

For the purpose of this dissertation, we define promotion as a customer promotion with a reduced price, which is highlighted by advertising and limited in time.

The short term impact of promotions becomes evident in Fig. 2.3: customers respond (Huchzermeier et al. 2002)! The figure displays prices and demand for a diapers brand at a German retailer in 2003. Whenever prices decrease, customer demand increases and can be more than five times higher than demand at regular

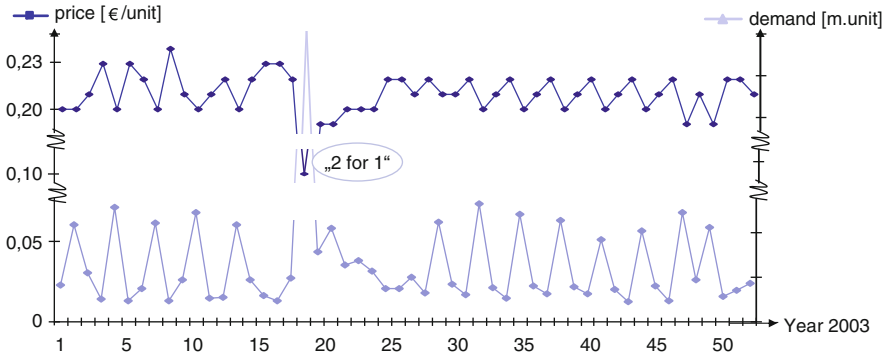


Fig. 2.3 Demand and prices for a diapers brand at a major German retail chain in 2003. Source: own data

prices. However, the volume increase in promotions comes along with high demand volatility: at the same price level, e.g., in week 5 and week 8 in Fig. 2.3, the demand is at 10.2 million units and 8 million units respectively.

With higher volatility of demand, the forecast inaccuracy increases in promotions. A branded goods manufacturer reports an average percentage error (WAPE) of up to 130% for the hygiene category, whereas every-day-business is well under control (Polman 2004). Hence, promotions generate the majority of out-of-stocks, excess inventory and unplanned logistics costs. Not only do retailers and manufacturers lose sales and face higher costs, but moreover, customers become upset if they experience the neglected promise of a promotion in out-of-stock situations and retailers thus put the loyalty of their customers at stake (VICS 2004). In order to improve forecast accuracy in promotions, retailers and manufacturers follow the second trend in the German retail industry: they start to collaborate (GCI and Capgemini 2008).

2.2.2 Retail Price Formats

Whether a retailer promotes and, if so, to what extent is characterized by his retail price format. Three retail price formats are prevalent in the German retail environment. These are (1) high-low pricing (HILO), (2) pattern promotions and (3) every day low pricing (EDLP).

HILO retailers alternate prices between a higher regular price and the promotion price, leading to a high variability between the regular and promotion price. They rely on price promotions to attract customers. The HILO retailer often positions himself through providing further customer benefits, such as convenient service, high quality service or a broad assortment of products. According to Tang et al. (2001), the HILO retailer competes on service and assortment, and not on price, in contrast to an EDLP retailer.

While the HILO retailer promotes irregularly, promotions are regular under a pattern promotion strategy. The pattern is characterized by the length of its cycle as well as the sequence of prices within one cycle. Obviously a retailer promoting at a regular pattern is highly predictable to both its customers and its competitors. In terms of customer retention, this is positive: customers adapt to this cycle and the retailer wins them as so called “loyal customers” who purchase in promotions. In terms of competition, the pattern can have negative effects: the retailer is at the risk of being undercut. The impact of pattern promotions has been highlighted by Krishna (1994), but has otherwise received little attention in the literature.

An EDLP strategy differs from a promotional pricing strategy by not emphasizing price specials on individual products, but instead focusing customer attention on good value for money on a regular basis. It involves setting lower average prices with lower variability, i.e., a smaller difference between the regular and promoted price. The EDLP retailer is associated with a wide range of items, but a smaller selection of brands and a less convenient format as compared to the HILO retailer (Bunn and Banks 2004). From a theoretical supply chain perspective, an EDLP strategy provides the advantage of lower demand variability, which in turn reduces stockouts and improves inventory management.

Of course there is a large area of possible combinations in between these three strategies (Lal and Rao 1997). Empirical evidence suggests that the usefulness of the pricing strategy depends on the category. This is because customer price sensitivities can vary by category. In broad terms, the larger the promotional price sensitivity, the more suitable a HILO strategy and the smaller the promotional price sensitivity, the more suitable a strategy with low variation in price, i.e., an EDLP strategy.

Given that promotions are primarily some form of incentive scheme, the extent to which promotions add value is discussed controversially. Sceptics argue that frequent promotions undermine the customer’s brand loyalty by encouraging the switching habits of the bargaining customer. However, this is an oversimplification within the highly competitive German retail market, where not to promote would simply result in a loss of market share. A prominent example is Wal-Mart in Germany: refusing to attract the German customer with promotions, Wal-Mart fought eroding market shares and finally backed out of the German market in 2006 (Huchzermeier et al. 2005). Generally, in mature markets, customers view most brands as being adequate for their needs and hence substitutable. They want to be incentivized through promotions to switch between brands.

Also, we should not forget a genuine desire to use promotions as a way to change habitual buying patterns. Promotional objectives can include attracting new or lapsed customers, in other words increasing customer penetration, increasing the loyalty of existing customers or increasing consumption (Simon and Fassnacht 2009).

2.3 Collaboration

Manufacturers and retailers have sought to leverage information sharing and closer collaboration as a way to counter the competitive environment and at the same time improving declining profit margins and reviving growth. This strategy is based on a concept known as Efficient Consumer Response (ECR). ECR dates back to the early 1990s and is a concept which considers that collaboration between retailers and manufacturers is essential in order to “fulfil consumer wishes better, faster and at less cost”. Indeed, a widely acknowledged study by Kurt Salmon Associates (1993) projected that greater coordination between supply chain members in the grocery industry could save an estimated \$30 billion annually.

ECR is built on four important areas. The first area is *Demand Management*, which comprises all of the considerations associated with understanding and managing the demand for products and services. The second area *Supply Management* focuses on improving the replenishment process of products in the overall supply chain. The third area *Enablers* provides different tools of product identification and data management that are required to permit accurate and timely communication and registration of goods flowing between trading partners. Finally, Collaborative Planning, Forecasting and Replenishment (CPFR) is central to the fourth area of ECR, the *Integrators*.

Given the focus of this dissertation, we focus on the lastly mentioned area of ECR – Collaborative Planning, Forecasting and Replenishment. An introduction to the concept is the subject of the following section. Subsequently, we analyze the pros and cons of CPFR.

2.3.1 Collaborative Planning Forecasting and Replenishment

Collaborative Planning, Forecasting and Replenishment (CPFR) is a business practice that combines the intelligence of trading partners in the planning and fulfilment of customer demand (VICS 2004).

The first CPFR project was initiated in the mid 1990s by Wal-Mart and Warner-Lambert. The partners independently estimated demand six months in advance, compared the forecasts and resolved differences. The pilot provided benefits to both the manufacturer, in terms of a smoother production plan, and the retailer, in terms of a significant reduction of inventory (Seifert 2002). Since then, the framework for CPFR has been refined, resulting in the CPFR reference model.

The CPFR reference model provides a general framework for the collaborative aspects of the planning, forecasting and replenishment processes. Figure 2.4 illustrates this framework in which a retailer and a manufacturer work together to satisfy the demands of the end customer, who is at the center of the model.

The model defines four activities, each including two tasks on both the manufacturer and retailer side. In the first activity, *Strategy and Planning*, the trading partners develop a collaboration agreement and a joint business plan. In the second

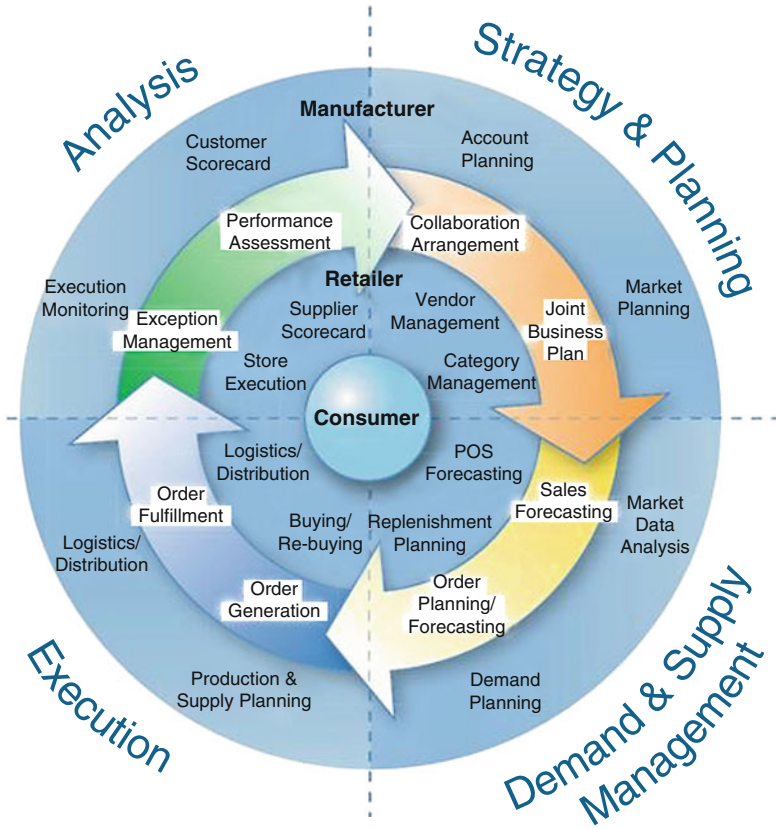


Fig. 2.4 Collaborative planning, forecasting and replenishment. Source: VICS (2004)

activity, *Demand and Supply Management*, the partners collaborate to forecast sales and orders. As supply is required, the order is generated and fulfilled in the third activity, *Execution*. The process concludes with the fourth activity *Analysis*, where exceptions are managed and performance is assessed. Each of the four steps is further broken down to predefined tasks for retailer and manufacturer (VICS 2004).

A recent pilot project at the Metro Group sales division Metro C&C reveals the benefits of CPFR. The CPFR process was designed with a focus purely on promotions rather than for the entire day-to-day business activities. The reason is the higher leverage that was expected from the focus on promotions, as promotions generate the largest swings in demand, and therefore cause high forecast errors. Hence they provide the largest improvement potential.

The pilot project at Metro C&C was set up with seven international suppliers, namely Colgate Palmolive, Henkel, Johnson & Johnson, Kimberly Clark, Lever Fabergé, Procter & Gamble and SCA. The focus was on collaboration in four categories, i.e., detergents, cleaners, hygiene paper and other papers and tissues, with

about 4,000 items. The pilot covered over 200 promotion events, lasting from mid 2002 to end 2004. The seven manufacturers formed a test group, while suppliers in the same categories without CPFR integration comprised the control group.

When evaluating the CPFR group as compared to suppliers not in the CPFR group, the following results were reported: sales went up by 25%, whereas in the control group they remained fairly constant at a lower level. The promotional stock service level improved a further percent point and increased to 99.5%. By contrast, the promotional stock service level in the control group declined by 3% to 94.7%. Finally, the CPFR pilot revealed a reduction of the end of promotion coverage: left-over stock levels of the CPFR partners went down by a significant 15% on average to 19 days, whereas the control group remained with 37 days of stock at the end of a promotion (Rode 2005).

What then has been retained from the pilot project? An extension to further categories and retail channels (e.g., at the Real chain) has been prepared but not yet been rolled out. We will describe the major drawbacks of the process in the following section to give some ideas on the hurdles of implementing CPFR.

2.3.2 Pros and Cons of CPFR

CPFR has the benefit of combining the inherently unique information of retailers and manufacturers (Aviv 2001). On the one hand, the retailer has information on the point of sales (POS), including regional prices and regional promotions. On the other hand, the manufacturer has information on the overall market perspective, including the competitive pressure in the market. Hence, the benefits reported from CPFR pilots are remarkable: inventory is reduced by 5% to 20% and on shelf availability is increased by 2% to 12% (Metro Group 2006). Also, the pilot of Metro C&C described before, was a success story.

However, there are major obstacles for a thorough rollout of CPFR pilots. The major problem encountered when operating CPFR is the lack of automation. First of all, most systems are island or isolated solutions, which require a different solution for each supplier or retailer respectively. A recent study revealed that over 40% of retailers and manufacturers that engage in CPFR exchange their forecasts manually based on Excel files (ECR 2004).

Secondly, the forecasts of manufacturers and retailers are based on different data sets; the manufacturer forecast is predominantly based on market research data, whereas the retailer forecast builds upon POS data. The market research data are of lower quality and only available after several weeks, but the POS data are available without time lag and at higher reliability. Further, the manufacturer's forecast lacks detailed information such as regional prices and regional promotions, which are available to the retailer. On the other hand, market research data allows getting the "big picture" with cross-regional and cross-brand influences. Obviously, different input data provide different forecast results.

This is also linked to the third obstacle: the collaborative partners use different planning units. The mindset of the manufacturer is in terms of production quantities; for example Procter & Gamble uses Statistical Units (SU) to make a product comparable across different package sizes. In contrast, the retailer forecasts on the level of stock-keeping-units (SKU), which would comprise, for the diapers example, as many as three different package sizes with 40, 80 and 120 units, each representing a different SKU. Consequently, the different planning units have to be made comparable.

Given these drawbacks, a real harmonization of forecasts can be possible for pilot products, but is hardly feasible for complete categories on a day-to-day basis. Instead retailers and manufacturers search for new means of information sharing, which are approached in the next section.

2.3.3 *The Competition Index*

Retailers identified competitors' price decisions as an important source for the high demand uncertainty in promotions, leading to excess inventory at the end of promotions or stockouts, culminating in high inventory costs.

Information sharing among supply chain partners is crucial to execute promotions efficiently. On the one hand, the retailer has private information about his promotion schedule. On the other hand, the manufacturer has private information about the market perspective. If combined, this information is expected to increase supply chain efficiency.

In order to improve supply chain efficiency, retailers and manufacturers could share the Competition Index, an early indicator on the competitive pressure. The Competition Index is calculated by the manufacturer, based on aggregated information from the retailers: the retailer informs the manufacturer about his planned promotion schedule, the manufacturer aggregates the information across all retailers in the market and derives the so-called Competition Index.

With the promotion schedule, the manufacturer has an important piece of information. No matter how the retailer will actually shape the promotion, the underlying effect remains the same: If a retailer promotes, he faces additional demand from the switching customer segment. Consequently, the order a retailer places will be higher during a promotion than at the regular price. Thus, the manufacturer attains a rough estimate of the retailer's order quantity.

The idea of the Competition Index is based on this simple connection between promotion price and order quantity. The official definition of the Metro Group is the following (Hopp 2005):

Definition 2.1. The Competition Index CI_t reveals the expected competitive pressure of retailer i in the market in period t as a percentage figure. It is calculated as the ratio of expected order quantity q_{ji} in period t across competitors j and the average order quantity across previous periods $t - x, \dots, t - 1$ and competitors

$j, j \neq i$:

$$CI_{it} = \frac{\sum_j E(q_{jt})}{\sum_j \sum_{t-x}^{t-1} E(q_{jt})}$$

According to this definition, the Competition Index allows the retailer to conclude whether his competitors are ordering above average, and therefore planning to promote in the upcoming period, or, alternatively, ordering at a level corresponding to demand at regular pricing. The competitors' average order quantity is determined on a rolling average of previous periods, where the number of periods is kept long enough to smooth out seasonalities.

Observe that one cannot reach any conclusions on the ordering or pricing behavior of individual retailers from the above definition of the Competition Index but rather only from the aggregated competition. This has two main reasons. First, the Competition Index is based on a rough estimate of order quantities and is therefore only a description of the competitive pressure in the market. Second, the promotion intensity amongst retailers in the German market environment is high as evident from Fig. 2.5.

The figure shows the price development of five major German retail chains on a weekly basis. Usually, there is more than one retailer offering the product at promotional price. Therefore, extracting a specific retailer is not possible due to the similar market shares of the leading retailers (also see Chap. 6 for a detailed analysis). However, the definition of the Competition Index allows conclusions regarding how the average competitor behaves.

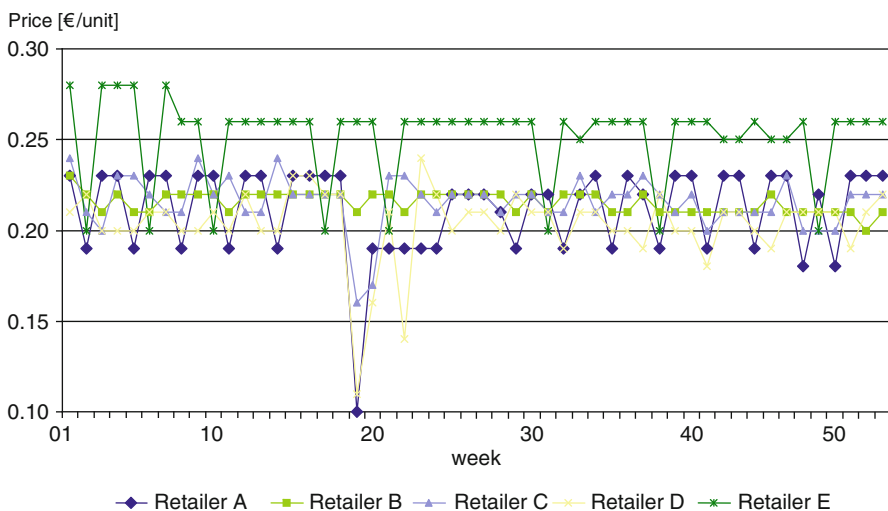


Fig. 2.5 Prices for a diapers brand at five major German retailers, 2003. Source: own data

2.4 Research Questions and Methods

The objective of this dissertation is to determine the value of upstream information sharing, in form of the Competition Index, for customers, retailers and a manufacturer.

The views on the Competition Index are ambivalent. Positive attributes of sharing the Competition Index are: (1) Manufacturers are keen on having early information about retailers' promotions in order to improve production planning (Iyer and Ye 2000). (2) The retailers intention in using the Competition Index is to improve inventory management by reducing out-of-stocks and overstocking. This should not only result in higher payoffs for the retailers but also (3) increase service levels and lower prices for the customers.

However, there are negative views as well: manufacturers expect that with information sharing, retailers would, on average, increase their prices. This in turn is expected to reduce the customer base in the competition with other brands, and thereby decrease the manufacturer's market share. Further, retailers could refrain from sharing their private information about planned promotions due to confidentiality reasons, especially in markets with few players. We have seen earlier that one cannot conclude from the Competition Index who is promoting nor attribute the delivery quantity to a specific retailer in a highly fragmented competitive environment. Finally, competitive regulations could lie in opposition to information sharing, if retailers and manufacturers pool their information in order to maximize their profits by means of reducing competition and increasing retail prices. This behavior would decrease customer welfare and therefore interfere with anti-trust laws.

Given these ambivalent views towards the Competition Index, it is of interest to analyze how the upstream information impacts retailers' and manufacturer's profit as well as customer welfare. We chose a three step procedure to pursue this objective. Figure 2.6 provides a schematic overview:

1. How do customers respond to promotions?
2. How do retailers set promotion prices and inventory in a competitive environment?
3. How does upstream information impact the retailer's decision?

First, we analyze how customers respond to promotions in order to derive the customer demand function. This first step provides an insight as to which customer segments retailers are competing for, and is primarily an empirical task. We shall decompose a unique data set in the diapers category to prove existence and identify the size of three customer segments: loyal and smart customers, where the smart customers can further be segmented into stockpiling customers and store-switching customers.

In order to address the customer segments and gain market share, retailers compete by the use of promotions with a focus on the price sensitive smart customer segments. Whoever offers the lowest price in the market serves the smart customer segments. We shall apply a game theoretical approach and use a mixed strategy

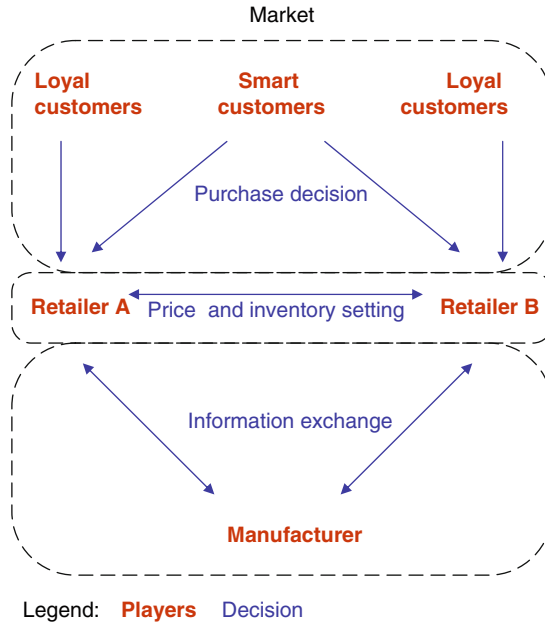


Fig. 2.6 Research overview

equilibrium framework to analyze the price competition between two symmetric retailers, where each retailer determines promotion frequency and promotion depth independently. Further, we shall link this marketing perspective to operations by making inventory an explicit choice variable for the retailer, based on the newsvendor model.

Finally, how does upstream information impact the retailer's promotion price and inventory decision? By comparing the two scenarios of no information sharing and information sharing, we shall see the impact on inventory costs (inventory effect), promotion frequency (frequency effect) and retailer profit (profit effect). Moreover, we shall provide insight into the impact of information sharing on customer welfare as an increasing promotion frequency may lower retail prices on average and hence increase customer welfare.