Chapter 1

Introduction

1.1 Definition of sales promotions

Sales promotions are a diverse collection of incentive tools designed to stimulate faster and/or larger purchases of products or services by consumers or the trade (Kotler 1997, p. 664). Where advertising offers a reason to buy, sales promotion offers an incentive to buy. Both advertising and sales promotions are instruments in the marketing communication mix. This mix also includes personal selling, direct marketing tools, public relations, and publicity.

Sales promotions consist of tools for consumer promotion, trade promotion, and salesforce promotion. Consumer promotions are aimed at final consumers. These promotions are initiated by either manufacturers or retailers. Well-known examples include temporary price cuts, three items for the price of two, sweepstakes, free trials, and coupons. Trade promotions are aimed at retailers by manufacturers. Examples are price reductions, advertising and display allowances, and free goods. Salesforce promotions are aimed at the salesforce of manufacturers. An example is a contest for sales representatives.

This thesis focuses on measurement of consumer promotion effects. Specifically, we measure aggregate consumer response, at the store level, to sales promotions offered by retailers. “Sales promotions” should be read as “consumer promotions” in the remainder of this thesis. We also use “promotions” and “sales promotions” interchangeably. Consumer promotions are often paid at least partially by manufacturers. That is, retailers pass a certain amount of the trade promotion through to consumers. Thus, the trade promotion allowances offered by manufacturers to retailers may be converted to temporary price cuts, special displays, etc. in the stores.
This chapter is organized as follows. We briefly review economic theories for the existence of sales promotions in section 1.2. In section 1.3 we show that manufacturers, retailers, and consumers have become increasingly focused on sales promotions during the past decade(s). In section 1.4 we describe the current state-of-the art of sales promotion effect measurement in practice and in the marketing research literature. From this review it is clear that there are important research issues to be resolved. In section 1.5 we present the specific research issues pursued in this thesis. We end this chapter with a short outline of the research approach (section 1.6).

1.2 Economic theories of promotions

Blattberg and Neslin (1990, pp. 83-111) review the following economic theories for the existence of promotions:

- Demand uncertainty (Lazear 1986);
- Inventory cost shifting (Blattberg, Eppen, and Lieberman 1981);
- Differential information (Varian 1980);
- Price discrimination (Narasimhan 1984; Jeuland and Narasimhan 1985);
- Loyals versus switchers (Narasimhan 1988);
- Prisoner’s dilemma (Blattberg and Neslin 1990).

We briefly summarize these theories below.

Lazear (1986) shows that under demand uncertainty it is more profitable to have a relatively high price in a first period and a lower price in a second period rather than having a fixed price. His results are based on the reservation price a consumer is willing to pay. The seller only knows the distribution of this reservation price. The seller should try a high price in the first period. Only if the consumer has a sufficiently high reservation price, the product will be sold in the first period. Otherwise it will be sold in the second period, when the price is lower.

Blattberg, Eppen, and Lieberman (1981) conjecture that retailers use promotions to shift their holding costs to consumers. A low-holding-cost consumer may “forward buy” (stockpile) due to promotion and hold inventory instead of the retailer. The retailer would hold inventory for the high-holding-cost consumers. If there is a consumer segment in the market that has holding costs low enough so that it pays the retailer to allow segment members to hold inventory, then a promotion is offered. Otherwise it is
1.2. Economic theories of promotions

Economically not attractive for the retailer to promote. In the latter case retailers would prefer to charge consumers the regular price, because the retailer is more efficient in holding inventory.

Varian (1980) argues that consumers have differential information on prices. Some consumers may not find the lowest price in the market for a given product at a given time because the search cost is too high. He assumes a set of uninformed consumers who shop randomly and a set of informed consumers who go to the store that offers the lowest price. He next shows that the optimal strategy for retailers is to offer a low price occasionally so as to attract informed consumers. The timing of temporary discounts should be unpredictable to minimize the opportunity for uninformed consumers to learn about the timing of promotions.

An explanation based on price discrimination is the following. Two segments of consumers exist, one with low elasticities (because of high transaction or holding costs), the other with high elasticities (because of low transaction or holding costs). By offering different prices to these two segments, the firm can increase its profits because the low-cost consumers have a higher elasticity of demand. Coupons (Narasimhan 1984) or retailer promotions (Jeuland and Narasimhan 1985) are vehicles that may be used to offer different prices to these segments.

Another way to segment consumers is into loyals and switchers. Loyal consumers always buy the same brand, whereas switchers buy whichever brand is promoted. Narasimhan (1988) builds a profit maximization model based on this assumption. He shows that if a firm fixes its price, a competitor can increase (short-run) profits by temporarily reducing price. This means that firms have an incentive to randomize prices so that the competitor cannot anticipate the firm’s price. Therefore, the optimal strategy for each firm is to vary its price randomly.

Finally, one commonly used explanation for the use of promotions is the “prisoner’s dilemma” (Blattberg and Neslin 1990, p. 107). The concept is that if firm A promotes and firm B does not, then the firm that promotes captures an increased market share at the expense of the firm that does not promote. Therefore the latter firm starts offering promotions as well. At some point in time, all firms in the market offer promotions and none of them is able to abandon this strategy, since each would lose customers. So all players find themselves in a suboptimal situation, since it would be more profitable for each firm not to offer promotions at all.
1.3 Focus on sales promotions

There are three primary parties relevant to sales promotions: manufacturers, retailers, and consumers. These three groups have become increasingly involved with sales promotions, as we describe in sections 1.3.1-1.3.3. We list a number of reasons for this increased attention to sales promotion in section 1.3.4. New developments in this area are joint sales promotion programs between retailers and manufacturers, which we briefly describe in section 1.3.5.

1.3.1 Manufacturers’ focus on promotions

In many industries, sales promotions represent a large and growing proportion of the communication mix budget. In the USA, nondurable goods manufacturers now spend more money on promotions than on advertising (Blattberg, Briesch, and Fox 1995). Airlines periodically offer discounts to generate incremental traffic. Telephone companies offer cash amounts as inducements to consumers to switch. Finance institutions use promotions to induce customers to use their services. Farm equipment manufacturers use price promotions to sell excess inventory. Across industries, price promotions are an important part of the marketing mix.

Table 1.1 summarizes the trends in marketing communication expenditures in the Netherlands in the period 1985-1998. The last column (1998) in Table 1.1 shows that personal selling is the largest expense factor in marketing communication (28,700 million guilders). This number includes telemarketing expenditures and salaries for sales representatives. Sales promotion takes second place (9,810 million guilders).

| Table 1.1: Marketing communication expenditures in the Netherlands (millions of guilders) |
|-----------------------------------|-------|-------|-------|-------|-------|-------|
| Personal selling                  | 14,000| 20,500| 25,750| 26,600| 27,650| 28,700|
| Sales promotion                   | 3,225 | 5,075 | 7,400 | 8,180 | 8,910 | 9,810 |
| Advertising                       | 3,740 | 5,670 | 6,700 | 7,200 | 7,695 | 8,465 |
| Direct mail                       | 2,560 | 3,160 | 3,540 | 3,730 | 3,975 | 4,250 |
| Other media                       | 2,615 | 3,815 | 4,820 | 5,145 | 5,390 | 5,685 |
| Total                             | 24,110| 38,220| 48,210| 50,885| 53,620| 56,910|
| Sales promotion share             | 12.3% | 13.3% | 15.3% | 16.1% | 16.6% | 17.2% |

Source: Incentive Magazine (December 1997, pp. 6-9) and Incentive Magazine (December 1998, pp. 54-57).

* The expenditures to personal selling are rough estimates.
1.3. Focus on sales promotions

The trends in the expenditures in Table 1.1 show that sales promotion has become more important in the marketing communication mix. For example, sales promotion received a smaller amount than advertising in 1985 and 1990. However, since 1995 sales promotion has taken a larger share of the marketing communication budget relative to advertising. The growth in sales promotion expenditures in the period 1985-1998 is 204 percent \((9,810 - 3,225)/3,225\), whereas it is 136 percent \((56,910 - 24,110)/24,110\) for the total marketing communication expenditures in this period. The share of sales promotions has increased from 12.3 percent in 1985 to 17.2 percent in 1998.

Table 1.2 shows the investments in alternative sales promotion types in the Netherlands during the period 1985-1998. We see that price off/refunds is the most important sales promotion vehicle, although its share decreased from 65 percent \((2,100/3,225)\) in 1985 to 46 percent \((4,500/9,810)\) in 1998. Sales promotion types that have become relatively more important are salesforce promotions, sampling, (event) sponsoring, and service-extra’s. Sales promotion types that have become less important in the Netherlands are, besides price off/refunds, self liquidators\(^1\) and sweepstakes.

Table 1.2: Expenditures on alternative sales promotion types in the Netherlands (millions of guilders)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Price off/refunds</td>
<td>2,100</td>
<td>2,650</td>
<td>3,500</td>
<td>3,800</td>
<td>4,100</td>
<td>4,500</td>
</tr>
<tr>
<td>Salesforce promotions</td>
<td>270</td>
<td>600</td>
<td>1,100</td>
<td>1,250</td>
<td>1,350</td>
<td>1,450</td>
</tr>
<tr>
<td>Self liquidators</td>
<td>95</td>
<td>155</td>
<td>180</td>
<td>200</td>
<td>220</td>
<td>240</td>
</tr>
<tr>
<td>Other premiums</td>
<td>80</td>
<td>130</td>
<td>200</td>
<td>225</td>
<td>240</td>
<td>250</td>
</tr>
<tr>
<td>Coupons</td>
<td>165</td>
<td>210</td>
<td>250</td>
<td>280</td>
<td>300</td>
<td>330</td>
</tr>
<tr>
<td>Sweepstakes</td>
<td>85</td>
<td>160</td>
<td>200</td>
<td>215</td>
<td>225</td>
<td>240</td>
</tr>
<tr>
<td>Sampling</td>
<td>40</td>
<td>130</td>
<td>210</td>
<td>240</td>
<td>250</td>
<td>275</td>
</tr>
<tr>
<td>Sponsoring</td>
<td>245</td>
<td>580</td>
<td>950</td>
<td>1120</td>
<td>1250</td>
<td>1475</td>
</tr>
<tr>
<td>Event sponsoring</td>
<td>70</td>
<td>270</td>
<td>480</td>
<td>500</td>
<td>600</td>
<td>650</td>
</tr>
<tr>
<td>Service-extra’s</td>
<td>75</td>
<td>190</td>
<td>330</td>
<td>350</td>
<td>375</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,225</td>
<td>5,075</td>
<td>7,400</td>
<td>8,180</td>
<td>8,910</td>
<td>9,810</td>
</tr>
</tbody>
</table>

Source: Incentive Magazine (December 1997, pp. 6-9) and Incentive Magazine (December 1998, pp. 54-57).

We show in Table 1.3 the trends in manufacturers’ relative expenditures on marketing communication in the USA. This table demonstrates convincingly that trade promotions have taken over the leading role of media advertising in the period 1981-1995. Expenditures on consumer promotions have been stable in a relative sense in this period (approximately 25 percent).

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1. A self liquidator is an item sold below its normal retail price to consumers who request it.
It is hard to obtain absolute figures on sales promotion expenditures in the USA. Cannondale Associates report in a 1999 Trade Promotion Study the following communication expenditures breakdown for packaged goods manufacturers: advertising 23 percent, consumer promotions 17 percent, account-specific marketing 7 percent, and trade promotion 53 percent. Cannondale also reports total trade promotion expenditures of $85 billion. The $85 billion number appears to be based on, for example, the off-invoice discount multiplied by units sold. One problem with this calculation is that without the discount a different number of units would have been sold. Still, it is probably the best estimate available. Based on this number and the breakdown presented above, the amount of money spend on consumer promotions is $27 billion. Hence, trade promotion- and consumer promotion expenditures together are $112 billion. However, there is a considerable amount of uncertainty about this number.

### 1.3.2 Retailers’ focus on promotions

In this thesis we focus on sales promotion in the fast-moving consumer goods branch. To provide a sense of the role of sales promotion in this sector, we show in Table 1.4, for a cross-section of seventeen product categories, total revenue, revenue generated by promotions, and the share of revenue attributable to sales promotion, for 1997. The promotional share varies from 23.0 percent to 1.7 percent. The weighted average percentage across 69 fast-moving product categories (seventeen of which are shown in Table 1.4) is 13.8 percent. The total sales volume sold under sales promotion is about 3 billion guilders in these 69 categories.3

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2. Personal information from Scott Neslin.
1.3. Focus on sales promotions

Table 1.4: Sales revenues, promotional sales revenues, and promotional shares in 1997

<table>
<thead>
<tr>
<th>Product</th>
<th>Total revenue (Dfl.)</th>
<th>Promotional revenue (Dfl.)</th>
<th>Promotional share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet tissue and kitchen paper</td>
<td>495.7</td>
<td>114.0</td>
<td>23.0%</td>
</tr>
<tr>
<td>Detergents</td>
<td>681.4</td>
<td>141.7</td>
<td>20.8%</td>
</tr>
<tr>
<td>Chocolate</td>
<td>620.7</td>
<td>125.4</td>
<td>20.2%</td>
</tr>
<tr>
<td>Biscuits/pastry</td>
<td>1091.1</td>
<td>207.3</td>
<td>19.0%</td>
</tr>
<tr>
<td>Juices</td>
<td>537.0</td>
<td>96.1</td>
<td>17.9%</td>
</tr>
<tr>
<td>Chocolate drinks</td>
<td>142.4</td>
<td>25.2</td>
<td>17.7%</td>
</tr>
<tr>
<td>Ice cream</td>
<td>327.9</td>
<td>58.0</td>
<td>17.7%</td>
</tr>
<tr>
<td>Soda’s</td>
<td>1437.7</td>
<td>253.0</td>
<td>17.6%</td>
</tr>
<tr>
<td>Coffee</td>
<td>1176.4</td>
<td>188.2</td>
<td>16.0%</td>
</tr>
<tr>
<td>Shampoo</td>
<td>204.0</td>
<td>32.0</td>
<td>15.7%</td>
</tr>
<tr>
<td>Cookies</td>
<td>126.8</td>
<td>15.1</td>
<td>11.9%</td>
</tr>
<tr>
<td>Soup</td>
<td>435.5</td>
<td>51.4</td>
<td>11.8%</td>
</tr>
<tr>
<td>Tea</td>
<td>183.6</td>
<td>21.1</td>
<td>11.5%</td>
</tr>
<tr>
<td>Rice</td>
<td>122.2</td>
<td>13.2</td>
<td>10.8%</td>
</tr>
<tr>
<td>Bread spread</td>
<td>672.7</td>
<td>52.5</td>
<td>7.8%</td>
</tr>
<tr>
<td>Dog food</td>
<td>174.4</td>
<td>7.8</td>
<td>4.5%</td>
</tr>
<tr>
<td>Sugar and sweeteners</td>
<td>240.6</td>
<td>4.1</td>
<td>1.7%</td>
</tr>
</tbody>
</table>


Price competition between retailers may be increasing after the abandonment of manufacturer-imposed minimum prices on January 1, 1998 in the Netherlands. This system allowed manufacturers to prescribe minimum prices to retailers. It was abandoned by the Dutch government to stimulate free market mechanisms. Some Dutch supermarket chains such as Edah appear to have taken advantage of the opportunity to engage in more frequent and deeper price promotions. Thus, data for 1998 may show higher promotional shares than what is reported for 1997 in Table 1.4.

1.3.3 Consumers’ focus on promotions

Consumers are confronted with a large number of sales promotion activities. For example, the largest supermarket chain in the Netherlands, Albert Heijn, has promotional offers for about 400 items in a given week. This number may increase in the future, since electronic shelf tags and customer bonus cards make it easier for retailers to implement such sales promotions as temporary price cuts.

As promotional activities increase it is conceivable that consumers adapt their purchase behavior in terms of store choice, brand choice, purchase timing,
and purchase quantity. For example, Urbany, Dickson, and Kalapurakal (1996) show that 32 percent of all shoppers responding to a survey decide each week where to shop on the basis of advertisements or fliers. They also report that 17 percent of the consumers regularly shop the price specials at one store and then do the same for the price specials at another store. Separately, Krishna (1994a) documents that one third of a sample of all USA households only purchase coffee if there is a sales promotion for any of the brands. Finally, Mela, Gupta, and Lehmann (1997) conclude from a study of more than eight years of consumer purchase data that price promotions make both loyal and non-loyal consumers more sensitive to price. Thus, consumers are confronted with an increasing number of promotional activities, and they adjust their purchase behavior to take advantage of these activities.

1.3.4 Reasons for increased focus on sales promotions
The absolute and relative growth in promotional activities can perhaps be explained by the following considerations (Blattberg and Neslin 1990, pp. 15-17, Bradley 1995, pp. 835-836, Foekens 1995, Kotler 1997, p. 666):

- The number of brands has increased. For manufacturers, it becomes more difficult to draw attention from consumers, marketing intermediaries, and retailers. As a result, manufacturers make greater use of promotions to attract the attention of target groups;
- Competitors use promotions frequently. It is difficult for one manager to stop offering sales promotions, since consumers may switch to other brands that continue offering deals. As a result, many manufacturers face a prisoner’s dilemma (see section 1.2);
- Many brands are at parity. Hence, it is difficult to position brands with advertising messages only. Therefore, sales promotions are employed to support or supplement advertising campaigns;
- Sales promotions are frequently used to introduce new products, i.e., to obtain shelf space for these products. With the large increase in new-product introductions in recent years, there has been a similar growth in sales promotion activity;
- Consumers are more focused on sales promotions (see also section 1.3.3);
- The trade has demanded more deals from manufacturers. Greater concentration of channel power in the hands of retailers has increased the
1.3. Focus on sales promotions

pressure on manufacturers to provide broader and wider sales promotion support and allowances;

- It is more difficult to forecast demand for new brands. Retailers and manufacturers often find themselves with excess inventory. As a result, they must offer more inventory-clearing promotions;
- Advertising efficiency could have declined because of rising costs, media clutter, and lead constraints, i.e., the time it takes before an ad can be placed. Nevertheless, the amount of money spent on advertising is still increasing, but at a lower rate than the sales promotion expenditures (see also Table 1.1);
- The analyses of weekly scanner data shows that the short-term sales impact of sales promotions can be very large. These sales spikes used to be hidden in data with larger inter-observation intervals. Consequently, promotions are now more accepted as an effective tool. The effects of advertising, on the other hand, are much more difficult to determine. Failure to measure advertising effects adequately leads to an underestimation of its impact (Jones 1986). This is a probable reason for the steady switch of marketing expenditures from the long-term brand building offered by advertising, to the short-term-, but apparently easily measured, sales promotions (Magrath 1988 and Leeflang et al. 1999, Chapter 6);
- Simultaneously, many product managers are under greater pressure to increase their current sales. Perhaps independent of the profit consequences, managers who are oriented towards increasing short-term sales for their brands believe that promotion activities are very effective. We show in this thesis that this may be a myopic perspective.

We note that the growth in promotional activities may affect the applicability of Varian’s (1980) theory for the existence of promotions (see section 1.2). Specifically, if the timing of promotions for a specific item becomes predictable, the fraction of “informed consumers” may increase. For infrequently purchased items consumers will choose the store with the lowest price so that high-priced store will lose their customers and be pushed out of the market. Similarly, consumers will purchase frequently purchased goods only at the time a given store offers a discount for this item.

On the other hand, the abundant use of sales promotions for many items makes it very difficult to track activities in many categories. Consumers may then select specific categories in which to specialize such that Varian’s theory
1.3.5 Joint manufacturer and retailer sales promotion programs

Manufacturers and retailers may cooperate in the development of special sales promotion programs. We mention two of these programs: Efficient Consumer Response (ECR) and tailor-made promotions. ECR is defined as the cooperation of trade partners, aimed at satisfying consumer needs at the lowest cost for the integrated distribution chain (Van de Griendt et al. 1997). The concept was introduced in 1992 in the USA in a joint effort by manufacturers and retailers. In 1994 the ECR Board Europe was founded by a number of leading manufacturers and retailers. Its mission is to have the parties work together to fulfill customer wishes better, faster, and at lower costs. In 1997 the ECR Board for the Netherlands was founded.

The concept of ECR includes “demand management”, “supply management”, and “enabling technologies”. “Demand management” is aimed at commercial processes in the distribution chain. It includes activities categorized as “efficient promotions”, “efficient assortment”, and “efficient new-product introductions”. Retailers and manufacturers cooperate to optimize these three elements using so-called enabling technologies (such as scanning and electronic data interchange). For “efficient promotions” the ECR concept requires promotions that simultaneously maximize category revenue/profit for the retailer and brand revenue/profit for the manufacturer.4 “Efficient promotions” require descriptive and normative models of promotion effects. For “supply management”, ECR requires accurate forecasts of the effects of sales promotions on sales to both retailers and to consumers, in order to manage production and logistics based on these forecasts. For “supply management” we need predictive models of promotion effects. The ECR concept is becoming increasingly popular in Europe as well as in the USA.

Tailor-made promotions are sales promotions that are specially developed for a particular retail chain by a particular manufacturer, and such promotions are developed to suit this retail chain’s customers. Tailor-made promotions now command a larger share of promotion expenditures than national

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4. However, this simultaneous maximization is almost impossible in a mathematical sense.
sales promotions do in the Netherlands. The increased importance of tailor-made promotions can be explained by the increased power of retail chains. If retail chains want to distinguish themselves from others, they may demand tailor-made promotional offers from manufacturers. Similarly, separate retailers (within retail chains) may want to obtain special promotional offers from manufacturers, based on their specific retail environments. This would be a form of micro-marketing, i.e., marketing tailored to a micro-environment.

1.4 Sales promotion effect measurement

This section introduces the measurement of sales promotion effects. We first present a brief overview of these effects in section 1.4.1. We next mention the importance of measuring sales promotion effects in section 1.4.2. Next we discuss the extent to which sales promotion effect measurement takes place in practice (section 1.4.3). In section 1.4.4 we summarize the key findings about effect measurement in the marketing literature. We present in section 1.4.5 the important research issues that remain to be resolved, according to marketing scientists and marketing practitioners.

1.4.1 Overview of sales promotion effects

We present in this section a brief overview of sales promotion effects. Throughout this thesis we return to these effects and provide more complete descriptions. We distinguish the following effects that may result from sales promotions:

- Brand switching: purchasing a different brand;
- Timing acceleration: purchasing earlier;
- Quantity acceleration: purchasing more;
- Purchase acceleration: general term for timing- and quantity acceleration together;
- Stockpiling: having a higher stock at hand due to timing- or quantity acceleration;
- Anticipatory responses: deferring the purchase until the anticipated promotion week;
- Store switching: purchasing in a different store;

5. Source: A. Boonman at AC Nielsen, the Netherlands.
Chapter 1. Introduction

- Deal-to-deal purchasing: purchasing only on promotion;
- Increased consumption: purchasing more and consuming it faster;
- Repeat purchasing: trying the brand on promotion and repurchasing it;
- Category switching: substituting purchases between categories;
- Complementary effects: buying products from other categories as complements to the promoted brand;
- Store traffic effects: choosing a store because of a sales promotion for one product, and purchasing other, non-related products in that same store.

1.4.2 Importance of sales promotion effect measurement

The importance of the measurement of sales promotion effects stems from the increased focus of manufacturers, retailers, and consumers on sales promotions. Manufacturers spend an increasing amount of money on sales promotions both in an absolute and in a relative sense (section 1.3.1). The percentage of revenue for retailers obtained through sales promotions is substantial (section 1.3.2), and consumers decide their purchase behavior to a large extent based on sales promotions (section 1.3.3). And finally, given the increasing importance of joint sales promotion programs (section 1.3.5), it becomes important to quantify sales promotion effects for both manufacturers and retailers.

To summarize, sales promotions play an increasing role in today’s market place. The question is whether this role is warranted. For example, PriceWaterhouseCoopers estimates that Dutch manufacturers and retailers waste more than a quarter billion guilders on unproductive sales promotions annually. In addition, Abraham and Lodish (1990) analyze trade promotions for all brands in 65 different product categories and conclude that only 16 percent of these trade promotions are profitable. The management of promotional activities can be improved through careful measurement of the effects of sales promotions. A primary objective of this research is the development of models for improved measurement of these effects. With superior knowledge of these effects, manufacturers and retailers can improve their decisions about sales promotions.

1.4.3 Effect measurement in practice

The measurement of sales promotion effects in practice is very limited. Exact figures are not available, but it is estimated that less than one percent of all

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sales promotions in the Netherlands are evaluated. This suggests that for most promotional activities in the Netherlands there is no quantitative basis for a judgment about their effectiveness a posteriori. And even if there is, this information is not used frequently to improve sales promotion decision making. In the USA, promotion measurement by the market research industry was estimated to account for 1 billion dollars in 1996, whereas total sales promotion expenditures might well be 100 times as large (see end of section 1.3.1). Although it is very difficult to determine an optimal amount for the measurement of effects, the topic of promotions is very complex, as we show in this thesis. We believe that sales promotion effect measurement receives far less attention in the practice of marketing than it should.

There are several reasons why the role of sales promotion effect measurement is limited in practice (partly based on Bucklin and Gupta 2000):

- Managers neither have the time nor have the required skills to build (econometric) models that can measure sales promotion effects. Today’s marketplace is characterized by rapid changes which leave managers little time for evaluations. In addition, the measurement of sales promotion effects (or the effects of any marketing expenditure) requires knowledge about model building, data handling, and so forth. Managers typically lack these skills;
- The software for building marketing models may not be suitable. Some packages are user friendly (i.e., are easy to work with) but are inflexible. Others are flexible (i.e., one can estimate any model) but requires the user to write complex computer codes;
- Managers may not want to measure sales promotion effects, since the outcome may be negative. For example, they may prefer not to know that the effectiveness of past promotions has been minimal;
- Managers may not have access to data of acceptable quality for measurement. The collection of data has reached a high level of precision and detail in some fields (such as in the fast-moving consumer goods branch) due to the use of scanning. On the other hand, in other fields the available data are still quite sparse. Examples include the service industry, areas of industrial marketing, and international marketing;

7. Source: H. Stegenga at PriceWaterhouseCoopers consultants, the Netherlands.
8. Source: A. Boonman at AC Nielsen, the Netherlands.
Managers may lack data. For instance, they may not maintain databases with characteristics of past promotion campaigns. They are even less likely to have information on the characteristics of past sales promotions by competitors;

Managers may be overwhelmed by data. For example, AC Nielsen (the Netherlands) provides clients with chain-level data for almost all Dutch supermarket chains, on a weekly basis, for all desired product categories, and for all varieties within these categories. For each variety, the data show sales volumes, prices, weighted distribution numbers, and weighted distribution of three types of sales promotions (temporary price cuts, feature advertising and displays). Due to this very high level of detail, managers may find it impossible to obtain meaningful overall perspectives;

Managers may decide it is too costly to let external market research companies (e.g., AC Nielsen or IRI/GfK) do the analyses.

1.4.4 Effect measurement in the marketing literature

There are many studies on sales promotion effect measurement in the marketing literature. Chandon (1995) refers to hundreds of articles on sales promotions. About 80-100 marketing scientists around the world are believed to develop models based on scanner data, either at the store level or at the household level (Bucklin and Gupta 2000). Many of these scientists focus at least partially on sales promotions.

We do not provide an overview of the complete literature on sales promotions. Instead, we refer the interested reader to publications that do give an overview:

1. Blattberg and Neslin (1990); this book is devoted to concepts, methods, and strategies in the field of sales promotions. It summarizes all important publications on sales promotions up to 1990;
2. Blattberg and Neslin (1993); this chapter provides an overview of sales promotion models;
3. Foekens (1995, Chapter 3); this chapter provides another overview of sales promotion models;
4. Blattberg, Briesch, and Fox (1995); this article summarizes the key findings in the literature up to 1995, provides research issues with conflicting empirical results, and also identifies issues without empirical
1.4. Sales promotion effect measurement

research. This article has a strong management focus, and it provides a basis for this thesis;

5. Chandon (1995); this overview article has a strong consumer focus. It summarizes consumer-oriented studies aimed at identifying heavy users of promotions and at tracking their purchase strategies involving the choice of a promoted brand;


Based on more than fifty articles on sales promotion effect measurement, Blattberg, Briesch, and Fox (1995) provide the following empirical generalizations:

- **Temporary price reductions substantially increase sales.** Empirical research has found that temporary retail price promotions cause a short-term sales spike. This result is fundamental to virtually all research done in the area of promotions;

- **Higher market-share brands are less deal (temporary price discount) elastic.** Thus, higher share brands have lower deal elasticities, even though higher share brands may reach a larger proportion of switchers from other brands than lower-share brands do;

- **The frequency of deal changes the consumer’s reference price.** This observation is important since it offers an explanation for the loss of brand equity when brands are heavily promoted. A lower consumer reference price reduces the premium that can be charged for a brand in the marketplace, which results in less “equity”;

- **The greater the frequency of deals, the lower the height of the deal spike.** Foekens, Leeflang, and Wittink (1999) find this effect based on varying parameter models. It is likely to be caused by (1) consumer expectations about the frequency of deals, and/or (2) changes in the consumers’ reference prices;

- **Cross-promotional effects are asymmetric: the promotion of higher quality brands reduces sale of weaker brands (and private label products) disproportionately.** One possible explanation is that asymmetry in switching is primarily due to differences in brand equity. Other explanations, such as prospect theory, have been offered in the literature. An extension of this finding focuses on asymmetries in brands’ qualities. It predicts the impact that promoting a brand in one quality
tiert is likely to have on consumers who switch from brands in other
tiers. Promoting higher-tier brands generates more switching than does
promoting lower-tier brands;

- Retailers pass less than 100 percent of trade deals through. Because
retailers are the vehicle for pass-through of trade promotion allowances
to consumers, it is important to recognize that brands differ in the amount
of pass-through;

- Display and feature advertising have strong effects on item sales.
Displays are special or separate locations for products. They provide
additional in-store attention. Feature advertising means outside-store
attention. Feature advertising is the inclusion of product names and
prices in store fliers or newspaper advertisements;

- Advertised promotions can result in increased store traffic. There is
surprisingly little empirical work devoted to this issue, given its practical
importance for retailers. The weight of evidence, however, is that
advertised promotions of some products and categories do have an
impact on store traffic (Kumar and Leone 1998, Walters 1991);

- Promotions can affect sales in complementary and substitute categories.
Although this possibility is recognized by practitioners, the magnitude of
this effect is rarely understood. The sales effect of promoting an item in
one category on items in a complementary category is likely a function
of the characteristics of the categories. For example, the promotion of a
spaghetti sauce may also increase the sales of some spaghetti items. On
the other hand, the promotion of an ice cream brand may reduce the sales
of other dessert items.

1.4.5 Research issues in sales promotion effect measurement

Blattberg, Briesch, and Fox (1995) enumerate a number of issues with
conflicting, little, or no empirical results in the marketing literature on sales
promotions:

1. What is the shape of the deal effect curve? The deal effect curve shows
the relationship between the percentage promotional price discount and
the sales of the brand that is price promoted. Is the deal effect curve
linear, concave, convex, or S-shaped? Little is known about the shape
of the deal effect curve, even though the shape is critical for the
determination of “optimal” dealing amounts. For example, if the shape
is convex (i.e., deals have increasing returns), then the firm will run
deeper discounts than if the effect is concave (i.e., decreasing returns), everything else being equal. Some argue that the curve has an S-shape, with increasing returns over some range and decreasing returns at higher deal discounts. The argument is based on the belief that consumers can stockpile only a certain amount, after which their storage and holding costs are too high;

2. *There is a trough after the deal.* This effect has been surprisingly difficult to find. The early literature (Blattberg et al. 1981, and Neslin, Henderson, and Quelch 1985) found evidence of purchase acceleration and stockpiling, but later studies of aggregated purchase data do not seem to find a “postpromotion dip”. Examination of store-level scanner data for frequently purchased goods rarely reveals a dip after a promotion, but some researchers do find evidence of a dip in household panel data. This anomaly is surprising and needs to be better understood;

3. *The majority of promotional volume comes from switchers.* Totten and Block (1987) and Gupta (1988) find that the majority of promotional volume comes from switchers. However, Vilcassim and Chintagunta (1992) and Chintagunta (1993) find that more promotional volume comes from category expansion than from switchers. The latter result is consistent with observations that the sum of cross-price elasticities is much smaller than the absolute value of own-price elasticities (Bemmaor and Mouchoux 1991) which implies that much promotional volume is not gained at the expense of other brands;

4. *What is the category expansion effect of deals?* With increasing importance being placed on category management, this question becomes critical for practitioners to understand. Manufacturers and retailers are very interested in the circumstances under which category expansion occurs and what causes it;

5. *What are the magnitudes and signs of the interaction between display, feature advertising, and price discount?* In the marketing literature, few empirical results have been generated regarding the synergies between feature advertising, displays, and price discounts. This is very important for both retailers and manufacturers because (a) they should determine the trade spending of manufacturers, and (b) they should influence the way retailers allocate display and feature advertising space. If there are synergies, then manufacturers should focus on obtaining joint merchandising with the retailer, and retailers should focus on using these merchandising tools to maximize their returns.
Bucklin and Gupta (2000) identify important issues in the area of sales promotion based on interviews with marketing practitioners (managers and researchers). They study the commercial use and adoption of state-of-the-art methods for analyzing scanner data by packaged consumer goods manufacturers in the USA. They conducted wide-ranging in-person interviews with 41 executives from 10 data suppliers, packaged goods manufacturers, and consulting firms. They conclude that the application of analytical methods to scanner data has yielded some notable successes in marketing mix decision making, particularly in consumer- and trade promotions. However, the interviewees suggest that the following research issues in the area of sales promotion and pricing remain:

1. **Price threshold.** If a brand has an own-price elasticity of –2, a 10 percent decrease in its price should increase its unit sales by 20 percent. Many managers, however, believe that such effects are unlikely to occur unless the price decrease crosses a certain threshold. In other words, response to price changes are “sticky” over certain ranges of price;

2. **No postpromotion trough.** Most practitioners indicated that they do not find postpromotion dips in their data. Many therefore believe that promotions do not have negative effects in subsequent time periods;

3. **Baseline and incremental sales.** Research is needed to develop simple, robust models that will produce better estimates of sales that are truly incremental for the manufacturer, not borrowed from the future, from another store, or from a sister brand;

4. **Need for account-level analysis.** The managers indicate they prefer analyses at the account level rather than analyses at the market level, since the account level is used for many decisions.

1.5 **Contributions of this research**

This thesis studies three important issues in sales promotion research. These issues are based on (1) the issues raised by Blattberg, Briesch, and Fox (1995) (denoted as BBF below), (2) the issues put forward by Bucklin and Gupta (2000) (denoted as BG below), and (3) discussion with cooperating individuals at manufacturers, retailers, and market research agencies.10 We show the three

10. Special thanks go to E. van Acquoij, A. Boonman, G. Halewijn from the market research company AC Nielsen, C. Berkhout from the manufacturer Kraft Jacobs Suchard, E. Foekens from the retailer Albert Heijn, K.J. van de Hoven from the retailer Schuitema, R. Molendijk
1.5. Contributions of this research

issues studied in the empirical chapters of this thesis (Chapters 2-4) in Table 1.5. We also show in this table how these issues relate to the issues proposed in the literature.

Table 1.5: Overview of research issues studied in this thesis

<table>
<thead>
<tr>
<th></th>
<th>Chapter 2: Deal effect curve</th>
<th>Chapter 3: Pre- and postpromotion dips</th>
<th>Chapter 4: Decomposition of promotion effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BBF (Blattberg, Briesch, and Fox 1995):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Deal effect curve</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Trough after the deal</td>
<td></td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>3. Amount of brand switching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Category expansion effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Interaction effects</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td><strong>BG (Bucklin and Gupta 2000):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Price threshold</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. No postpromotion trough</td>
<td></td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>3. Model for incremental sales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Account-level analysis</td>
<td></td>
<td>(√)</td>
<td>√</td>
</tr>
</tbody>
</table>

* In Chapter 3 we use one data set that is not account-specific.

The first issue is the shape of the deal effect curve (Chapter 2). It relates to BBF issue 1 and to BG issue 1. There has been very little research in this area, whereas it has great importance for practice. We use new, semiparametric techniques to determine this shape for brands from three product categories. We also show interaction effects between feature advertising, display and price discounts (BBF issue 5).

The second issue is on pre- and postpromotion dips for store-level scanner data (Chapter 3), related to BBF issue 2 and to BG issue 2. The paradox is that studies using household-level data often do find dips, whereas store-level studies usually do not. We propose a method to measure both postpromotion- and prepromotion effects. We take the interaction effects between feature advertising, display activity and price discount into account in measuring pre- and postpromotion dips (BBF issue 5).

The third issue is the decomposition of the sales effect of promotions into cross-brand effects, dynamic effects, and category expansion effects (Chapter 4). This research issue relates to all nine issues displayed in Table 1.5. In this chapter we address the questions “whether most of the volume comes from the manufacturer Grolsch, and T. Wilms from the manufacturer Sarah Lee (all in the Netherlands).
from switchers” (BBF question 3), “what is the category expansion effect of deals” (BBF question 4), “whether there is a trough after the deal” (BBF question 2), and “the demand for a simple model to determine the sales effect of promotions that is truly incremental” (BG issue 3). We present separate decomposition results for price cuts with various types of support (no support, feature-only, display-only, and feature and display). This research also bears on BBF question 1 and BG issue 1 (shape of the deal effect curve), since we model the decomposition sources as a function of price cut levels.

Except for one data set used in Chapter 3, all analyses in Chapters 2-4 are account-specific. Hence we also address BG issue 4. Thus, our results are also useful for the development of joint sales programs between manufacturers and retailers (see section 1.3.5).

1.6 Research approach

We develop econometric models to measure the effects of sales promotions (predictor variables) on sales (criterion variable), based on weekly store-level scanner data. With respect to the data choice, there are basically two options: experimental data and non-experimental- or historical data. We use non-experimental data because we want our methods to be applicable to data encountered by managers on a regular basis. We use store-level-, rather than household-level-, scanner data. We summarize specific advantages and disadvantages for these two data types in Table 1.6.

Table 1.6: (Dis)advantages of data types

<table>
<thead>
<tr>
<th>Household-level scanner data</th>
<th>Store-level scanner data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information per household</td>
<td>Information across households</td>
</tr>
<tr>
<td>Answers to “why” questions</td>
<td>Answers to “what” questions</td>
</tr>
<tr>
<td>Segmentation possible</td>
<td>Segmentation (almost) impossible</td>
</tr>
<tr>
<td>Questionable representativeness</td>
<td>Good representativeness</td>
</tr>
<tr>
<td>Subset of store customers</td>
<td>All store customers</td>
</tr>
<tr>
<td>Data set construction cumbersome</td>
<td>Data set construction straightforward</td>
</tr>
<tr>
<td>Limited availability</td>
<td>Widespread availability</td>
</tr>
</tbody>
</table>

While managers recognize the special opportunities available from analyses of household-level data, they spend relatively little time and effort doing so unless they face a specific crisis (e.g., an otherwise unexplainable
loss in market share) (Bucklin and Gupta 2000). Nevertheless, household-level studies in the marketing literature should have great relevance to managers. The limited attention in practice for household-level data can be explained as follows (see also Table 1.6). First, answers to the “why” questions that household data can provide are usually not required in the “critical path” of tactical decisions that must be made on a day-to-day basis, whereas answers to the “what” questions are (Bucklin and Gupta 2000). Store-level data are very well suited to answer “what questions” such as “what is the sales effect of a promotion?”. On the other hand they are not as well suited for answering “why questions” such as “why is the effect this large?”. Second, managers report discomfort about household panel data because of a potential lack of representativeness and because the share estimates may differ from store-level data (Gupta et al. 1996, Leeflang and Olivier 1985, Bucklin and Gupta 2000). Third, typical household purchase sample sizes are small in low penetration categories: the registration of approximately 70 percent of all items at the household level is unreliable due to low sales rates. This is because household-level data only represent the purchases of a subset of all store customers, whereas store-level data include all customers. Fourth, the analysis of household data is time consuming, and “the quantity” of data required may be excessive. To illustrate, the household-level scanner data sets obtained by home scanning (instead of in-store card scanning) lack data on promotional activities, especially for items not purchased. Hence, these data sets would have to combined with store-level data for the measurement of sales promotions, which is not a trivial task. Finally, store-level scanner data are much more widely available than household-level scanner data in the Netherlands. To conclude, we use store-level data in this thesis because of the enhanced managerial relevance over household-level data, but we do recognize that household data can provide more detailed insights.

11. Based on a simulation study, Bodapati and Gupta (1999) show that store-level data often contain more information for estimation of a specific latent class choice model, given the much larger sample size the store-level data are based on relative to household-level data.