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# Optimising supermarket promotions of fast moving consumer goods using disaggregated sales data: A case study of Tesco and their small and medium sized suppliers

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## Abstract

The use of price promotions for fast moving consumer goods (FMCG's) by supermarkets has increased substantially over the last decade, with significant implications for all stakeholders (suppliers, service providers & retailers) in terms of profitability and waste. The overall impact of price promotions depends on the complex interplay of demand and supply side factors, which has received limited attention in the academic literature. There is anecdotal evidence that in many cases, and particularly for products supplied by small and medium sized enterprises (SMEs), price promotions are implemented with limited understanding of these factors, resulting in missed opportunities for sales and the generation of avoidable promotional waste. This is particularly dangerous for SMEs who are often operating with tight margins and limited resources.

A better understanding of consumer demand, through the use of disaggregated sales data (by shopper segment and store type) can facilitate more accurate forecasting of promotional uplifts and more effective allocation of stock, to maximise promotional sales and minimise promotional waste. However, there is little evidence that disaggregated data is widely or routinely used by supermarkets or their suppliers, particularly for those products supplied by SMEs. Moreover, the bulk of the published research regarding the impact of price promotions is either focussed on modelling consumer response, using claimed behaviour or highly aggregated scanner data or replenishment processes (frameworks and models) that bear little resemblance to the way in which the majority of food SMEs operate.

This thesis explores the scope for improving the planning and execution of supermarket promotions, in the specific context of products supplied by SME, through the use of dis-aggregated sales data to forecast promotional sales and allocate promotional stock. An innovative case study methodology is used combining qualitative research to explore the promotional processes used by SMEs supplying the UK's largest supermarket, Tesco, and simulation modelling, using supermarket loyalty card data and store level sales data, to estimate short term promotional impacts under different scenarios and derive optimize stock allocations using mixed integer linear programming (MILP).

The results suggest that promotions are often designed, planned and executed with little formalised analysis or use of dis-aggregated sales data and with limited consideration of the interplay between supply and demand. The simulation modelling and MILP demonstrate the benefits of using supermarket loyalty card data and store level sales data to forecast demand and allocate stocks, through higher promotional uplifts and reduced levels of promotional waste

## Acknowledgements

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# CHAPTER 1 -INTRODUCTION

## 1.1 Background

In 2007/8, manufacturers of fast moving consumer goods (FMCG) invested £25.6 billion in sales promotion with multi-saves, accounting for 66% of all retailers' promotions (Grocer, 2012). This high level of promotional activity is estimated to have added an average of two to three months of additional unit sales during a 12 month period (Harper, 2010). However, the impact of promotions on consumer purchasing behaviour varies considerably across different shopper segments, with younger shoppers (18 to 24 years) and families the two segments most likely to respond to promotions (Grocer, 2012).

Figure 1.1 shows the rising trend in the use of promotions over the last four years across three largest product categories (dairy, spirits, and ice cream) in the four largest supermarket chains (Tesco, ASDA, Sainsbury, Waitrose). This trend has significant implications for the volume and profitability of sales, for both manufacturers and retailers. The net impact (cost/benefit) depends on a variety of demand and supply-side factors, which can result in unexpected losses and waste as well as missed opportunities for improved sales and overall profitability (Villas-Boas and Zhao, 2005).

It has been estimated that the cost of sales promotions to the UK FMCG industry is around £14.4 billion (IPM, 2009). These costs include additional storage costs, increased manufacturing costs and waste resulting from un-sold products that are out of shelf-life. It has also been estimated that over £3 billion of the £14.4 billion invested in price promotions in the FMCG sector could have been retrieved by better co-ordination of supply and demand (Harper, 2010). These saving are particularly important for small food suppliers, who have limited resources and therefore need to maximise promotional uplifts and minimise promotional costs.
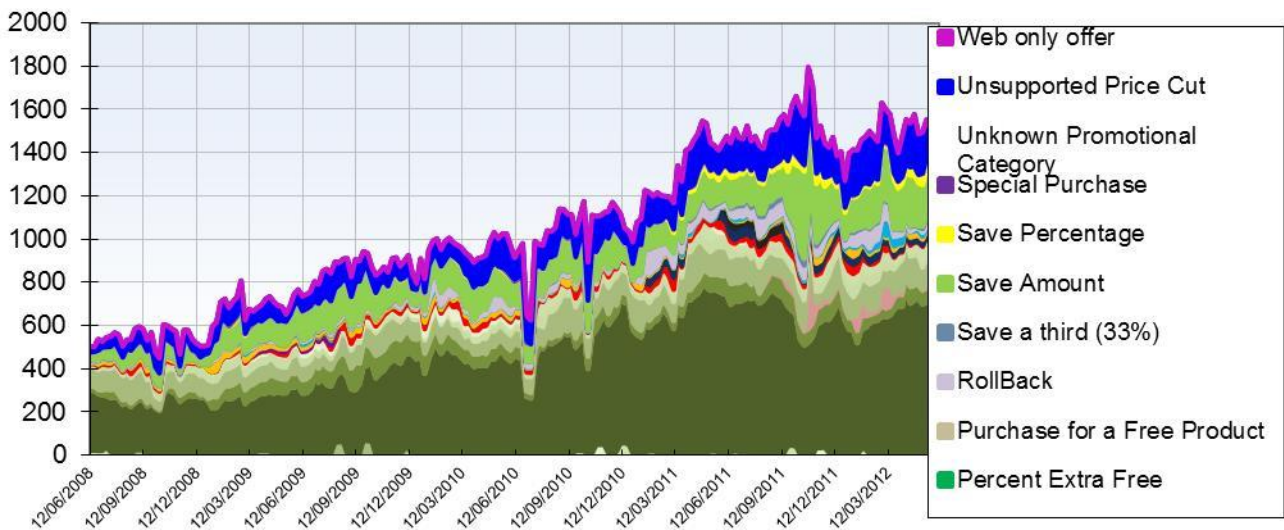
**Figure 1.1** Trend of all types of promotions during last five years (2008-2012) across the ambient and fresh produce categories (Brand View, 2014)

## 1.2 Problem statement

Despite their rapid rise, there is emerging evidence that sales promotions are implemented with inadequate planning and poor management, resulting in the continued erosion of profits and brand loyalty (Felgate et al., 2012). Thus, a better understanding of promotional impacts and the factors that influence promotional uplifts and cause excessive (and avoidable) waste would be of considerable benefit at a time when the sustainability of the UK food industry is continually being questioned by the media (BBC, 2014), policy-makers (DEFRA, 2007), lobby groups (LEAFUK, 2013) and commercial businesses are struggling to survive in an increasingly competitive environment (IGD, 2015).

An accurate estimate of consumer demand plays a key role in planning logistical support for sales promotions. Mantrala et al. (2009) have shown that, on the one hand, overestimation of consumer demand in sales promotions can result in high storage and waste costs, especially in the perishable foods category, whilst, on the other hand, underestimation can result in consumer complaints and loss of store/brand loyalty due to poor availability of stock. Therefore, the alignment of demand and stock allocation is a necessary condition for

effective sales promotions.

Similarly, it is estimated that £12 billion worth of food is wasted annually in UK; in the context of promotions £6.7 billion worth of edible food from this is thrown away 'unused' (WRAP, 2010). This avoidable food waste is attributed to use of promotional mechanics especially temporary price reductions and multi-buy offers which accounts for 22% percent of total food sales. Table 1.1 below gives the percentage of purchase becoming waste across different food and drink categories in UK due to multi-buy and temporary price reductions.

| Products | Percentage of purchase becoming waste |
|---|---|
| Apples | 31% |
| Bread | 29% |
| Ham | 11% (value for meat & poultry) |
| Tomatoes | 20% (value for fresh veg & salads) |
| Yoghurt | 8% (value for dairy products) |

**Table 1.1:** Comparison of percentage of purchases being wasted by multi-buy & temporary price reduction (WRAP, 2010)

It is clear from the table above that fresh produce category (fruit & veg) has the highest waste percentage (51%) due to these two promotional mechanics (multi-buy & temporary price reductions). These waste levels are clearly un-sustainable and can be avoided by better understanding of consumer needs during promotions and its associated supply chain issues.

## 1.3 Research Question

It is clear from above that sale promotions are frequent and producing unsustainable levels of waste, especially for small food suppliers. These factors are attributed to inadequate co-ordination of demand and supply chain factors. It has been argued that a deeper understanding of the relationship between promotional impacts and stock allocation for

different types of consumers and different types of food are needed (Hawkes, 2009). This thesis aims to fill this gap, with particular emphasis on the synchronisation of demand and supply through the more effective use of management information.

The specific context in which promotional impacts are considered in this research juxtaposes the UK's largest supermarket, Tesco, with their smallest suppliers, responsible for the production of branded (niche) products and own label 'commodities' – fresh fruit and vegetables and combines the richest source of disaggregated sales data (Tesco Club card) with the unsophisticated and un-structured decision-making processes of small and medium-sized enterprises (SMEs). The aim is to establish whether the use of this data could make a material difference to the effectiveness of price promotions.

Simulation modelling is a robust decision support tool and has been used in this study. Simulation modelling enables the estimation of differential impacts under different scenarios. In the context of promotional impacts, these different scenarios take account of the different characteristics of products, different weather conditions, stores formats, shopper segments and the impact that different promotional mechanics might have under different configurations thereof.

## 1.4 Research objectives and methods

This research aims to identify the potential benefit of incorporating dis-aggregated sales data, by store type and shopper segment, for products with distinct characteristics, through more accurate forecasting of promotional demand and more accurate allocation of promotional stock.

In order to achieve this a case study methodology has been adopted using a combination of qualitative and quantitative methods within the context of the Tesco supply chain for niche branded (ambient) products and own label (fresh) fruit and vegetables.

Following a review of the promotional literature, field interviews were conducted with key stakeholders (suppliers, retailers and service providers) in the promotional cycle. These

interviews served to validate the observations from literature and inform the design of a conceptual framework for the estimation of promotional impacts (sales uplift and promotional waste) under different scenarios. The estimation of promotional impacts involved a two stage process of simulation and optimization, incorporating supermarket loyalty card data and decision rules for stock allocation and sales forecasting based on the expert interviews.

## 1.5 Contribution

This research adds to the debate of unstructured marketing of SME's by highlighting the inadequate use of relevant information at planning stage of promotional cycle and its effects on stock allocation at store level. The conceptualisation, design and simulation of promotional strategies that takes account of product characteristics, store characteristics and shopper characteristics is novel and, it is hoped, will improve our understanding of the promotional cycle and identify opportunities for improvement that will benefit retailers and suppliers (particularly the smaller ones). Linking simulation with optimization to improve stock allocation at store level of small food suppliers is novel and helps connect demand with supply side during promotions.

This research also highlights that socio-economic factors of consumers, customer penetration and store format strongly impacts promotional sales and consequently waste in the context of small food suppliers product. Understanding of these important factors helps both academics and practitioners to observe promotional efforts of small food suppliers in more detail.

Careful applications of the findings of this research will enable practitioners to focus attention on essential and relevant factors that affect promotional sales growth. Such analysis, incorporating both supply-side and demand-side factors simultaneously, has not been attempted hitherto. Thus, the cross-functional multidisciplinary research conducted for this thesis has the potential to contribute theoretically, methodologically and in practical terms for researchers, policy-makers and practitioners in the food industry.

## 1.6 Thesis structure

The thesis is structured as follows. Chapter 2 presents a review of the promotional literature, which is drawn two perspectives - marketing and operations management. Chapter 3 presents the findings from the semi-structured expert interviews from a sample of suppliers from two food categories – cooking oil (ambient branded) and fresh produce (own-label). These interviews will serve to justify literature review gaps identified in chapter 2. Chapter 4 presents the conceptual model and research propositions arising from the literature review and the qualitative research. Chapter 5 explains and justifies the research methodology. Chapter 6 presents the results of the simulation & optimization models. Chapter 7 presents a discussion of the results and how they inform the existing body of knowledge. Chapter 8 concludes the thesis by acknowledging the limitations of this study and making recommendations for future research.

# Chapter 2- Literature review

## Introduction

The Promotional literature can be divided into two distinct areas. One is concerned with the demand-side and is focussed primarily on consumers' reactions to different promotional stimuli. This is the domain of marketing research. The other is concerned with the supply-side factors and is focussed primarily on the replenishment cycle and the how the supply chain responds to promotional activity. This is the domain of operations research.

This chapter presents a review of these two streams of the promotional literature, paying particular attention to a) the use of information in forecasting promotional demand and allocating promotional stock and b) the methods used to analyse promotional impacts. The he first section presents an overview of the way in which promotions are defined and how they are used as part of the marketing mix. The second section presents a review of the marketing literature, to determine how consumers respond to promotions. The third section presents a review of the operations research, to determine the supply-side issues relating to the execution of promotions. The chapter concludes by looking at the interaction between and co-ordination of supply and demand during the promotional cycle.

## 2.1 The role of sales promotions

There are multiple definitions of sales promotions in the marketing literature Webster (1971, p.556) first defined sales promotions as, 'short-term inducements to customer buying action'. Davis (1981, p.536) added another dimension by defining it as 'marketing efforts supplementary in nature performed for a limited duration in order to induce buying'. Schultz and Robinson (1982, p.8) added the role of different stakeholders into the definition by saying 'it's a direct inducement or incentive to the sales force, the distributor, or consumer, with the primary objective of creating an immediate sale'. Kotler (1988, p.645) defines sales promotions as 'a diverse collection of incentive tools, mostly short term, designed to stimulate quicker and/or greater purchase of a particular product by customers or the trade'

From these diverse definitions four important themes are evident:

a) Promotions are action focused

b) Promotions are marketing events

c) Promotions have a direct, immediate and short-term impact on consumer behaviour, and

d) Promotions are designed to influence market intermediaries.

Blattberg and Neslin (1990) tried to capture all of these themes by defining promotions as 'an action-focused marketing event aiming to have a direct impact on the firm's customer behaviour'.

Sales promotions falls into three major types: trade promotions, consumer promotions and retailer promotions. The end user is the focus of all sales promotions, so all the promotions offered to the consumer directly by the manufacturer fall into the consumer promotions category. However, when promotions are offered by manufacturers to retailers, they are called trade promotions. Sales promotions offered directly to the consumer by the retailers are called retailer promotions. Figure 2.1 summarises the relationship between the different types of promotions.
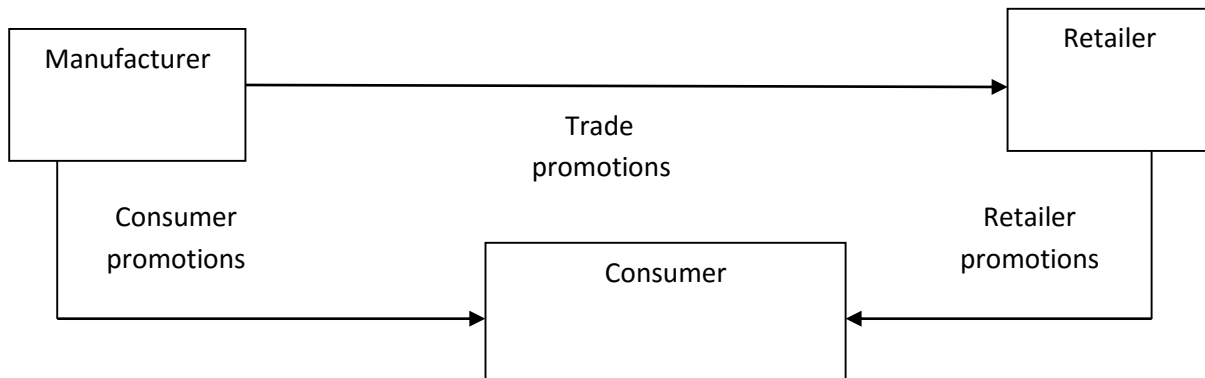


**Figure 2.1** A schematic framework of the major types of sales promotions (Blattberg et al., 1990).

There are other types of promotions which are formed by combinations of these. They are called 'cooperative promotions'. In these promotions, a free sample is tied in with the purchase of another product or promotion. In the broader context of marketing, retailer and trade promotions form part of a manufacturer's 'push' strategy. Whereas, consumer

promotions fall into the domain of a 'pull' marketing strategy. Both these elements work in harmony to achieve the desired marketing objectives of the firm. Table 2.1 summarises the different promotional mechanics that manufacturers and retailers have at their disposal.

| Retailer Promotions | Trade Promotions | Consumer Promotions |
|---|---|---|
| Price cuts | Case allowances | Couponing |
| Displays | Advertising allowances | Sampling |
| Feature advertising | Display allowances | Price packs |
| Free goods | Trade coupons | Refunds |
| Retailers coupons | Financing incentives | Special events |
| Contests/Premiums | Contests | Sweepstakes/contests |

**Table 2.1** Types of promotions (Blattberg and Neslin, 1990)

The majority of promotions are price promotions usually in the form of price cuts. There is considerable debate about the impact and value of price promotions (see following sections) with many authors highlighting the deterioration that can result in consumer loyalty from excessive reliance on price promotions and some authors (e.g. Carpenter and Moore, 2008: Harper, 2010) advocate more serious consideration of alternatives to price promotions that generate short-term sales uplifts without undermining brand loyalty. These (non-price) promotions invariable involve more careful targeting of specific benefits to specific shopper segments.

The importance of targeting distinct shopper segments has been highlighted by Felgate et al (2013), who analysed the impact of different promotional mechanics across the fresh meat category and identified distinctly different responses by different shopper segments.

There is a need to carefully examine promotions both from retailers and manufacturers perspectives and critically evaluate the promotional impacts in relation to their intended objectives. This critical evaluation requires a detailed understanding of consumer behaviour

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and associated supply chain issues. The next section reviews the marketing literature concerned with promotions.

## 2.2 Marketing perspectives on promotional impacts

The marketing literature is concerned primarily with the way in which promotions are used as part of the marketing mix and how they affect consumer behaviour. The different studies have been grouped according to their impact. Thus, this section explores the impact of promotions with respect to brand switching, purchase acceleration, product category expansion and customer loyalty.

### 2.2.1 Brand Switching

Brand switching is defined as 'enticement of consumer to purchase a different brand from its normal choice' (Blattberg and Neslin, 1990). Research conducted by Gupta (1988) suggests that gains by a promoted brand are primarily at the expense of other brands, due to brand substitution. It was found that 85 per cent of the short term effect of price promotions was brand switching and only 15 percent was temporary category expansion. Bell et al. (1999) studied 13 different product categories and found on average 75 percent of the short term effect of price promotions was brand switching and 25 percent was purchase acceleration.

More recent research has shown that the brand switching due to sales promotions is not as high as previously thought. Ailawadi and Bari (2009) has shown that brand switching accounts for only 45% of these short term impacts. However, retailer's perspectives on brand switching are different from suppliers, as brand switching can sometimes result in store switching which is not a desirable outcome for retailers (Horváth and Fok, 2013). Brand switching is thought to occur because the promoted brand becomes more appealing to the customer as a result of the discount and they may develop a more favourable attitude towards the brand (Sun et al., 2003). However, promotional effects depend upon the format (Pacheco and Rahman, 2015), type (Coulter and Roggeveen, 2014) and size (Gómez and Rao, 2009) of the promotion. If a promotion yields a modest increase in sales it will not markedly affect the same or competing brands in competing retailers.

Foubert et al., (2007) observed brand switching due to bundle promotions (i.e. family packs in the chips category. They used consumer panel data across eight different store chains to study consumer response to during bundle promotions. They showed that these promotions failed to increase category sales but resulted in a re-distribution of sales to different products.  They used Poisson regression to estimate consumer purchase quantities during promotions. However, their study was limited by the use of just a single product within the category and took no account of the heterogeneity of consumers present in these stores.

Sun et al. (2003) studied brand switching using dynamic structure models and sales data for ketchup. They showed that promotions change the timing of purchases with loyal customers, thus changing the pattern of their buying behaviour in order to benefit from the promotions on offer. They also highlighted the negative impact on retailers' profits as there was no increase the overall rate of consumption. However, they made some oversimplified assumptions about consumption rates across all households when in reality ketchup consumption is likely to vary considerably between households with different compositions. Similarly, the use the analysis of just one product reduces the generalizability of their findings.

Leeflang et al. (2012) observed brand switching in detergents, softeners and beer categories with the help of daily store levels sales data from a Spanish supermarket. They showed with the help of multiple regressions that promotions in one category can cannibalize sales from competing brands within categories. They strongly advocate the analysis of category sales when studying the impact of promotions and brand switching behaviour. Their study benefited from the use of daily store level sales data for a variety of products but failed to look at differential behaviour across different shopper segments.

Frequent price promotions may also lower a brand's reference price (the price to which regular shoppers are accustomed), resulting in a loss of consumer loyalty and brand switching when the product is at the regular price (Kim and Staelin, 1999). This means that the frequency of promotions also impacts significantly the brand switching behaviour of consumer.

It is clear that there are significant limitations around the number of products included, types of data used, methodologies employed and assumptions made about consumer behaviour which significantly inhibit our ability to understand the dynamics of this important consumer reaction to sales promotions.

## 2.2.2 Purchase Acceleration

Another important consequence of promotions is that they can often encourage consumers to buy promoted products in larger quantities or shorten the inter-purchase time. This phenomenon is called purchase acceleration or stockpiling, which increases household inventory levels and consumption rates.

Aggarwal and Vaidyanathan (2003) have shown that consumers in time-bound promotions are more likely to accelerate their purchases as they feel under pressure to capitalise on the promotional offer(s).

Ailawadi et al. (2007) observed the stock piling induced from promotions of ketchup and yogurt categories by decomposing sales into three important components - consumption, pre-emptive switching and loyal acceleration, as shown in figure 2.2 below. They used aggregated scanner panel data for 26 weeks and used multinomial logit model to estimate the consumption of each household. They showed that the effects of stock piling are complex and result into increased consumption, repeat purchase and pre-empts the purchase of competitive brands. However they were unable to distinguish between stock piling of national brand vs. private brand which can significantly limits their findings as consumers have been shown to react differently to different brands within the same category. Also, the model assumes that consumption rates are common across all households which are unlikely to be the case in reality.
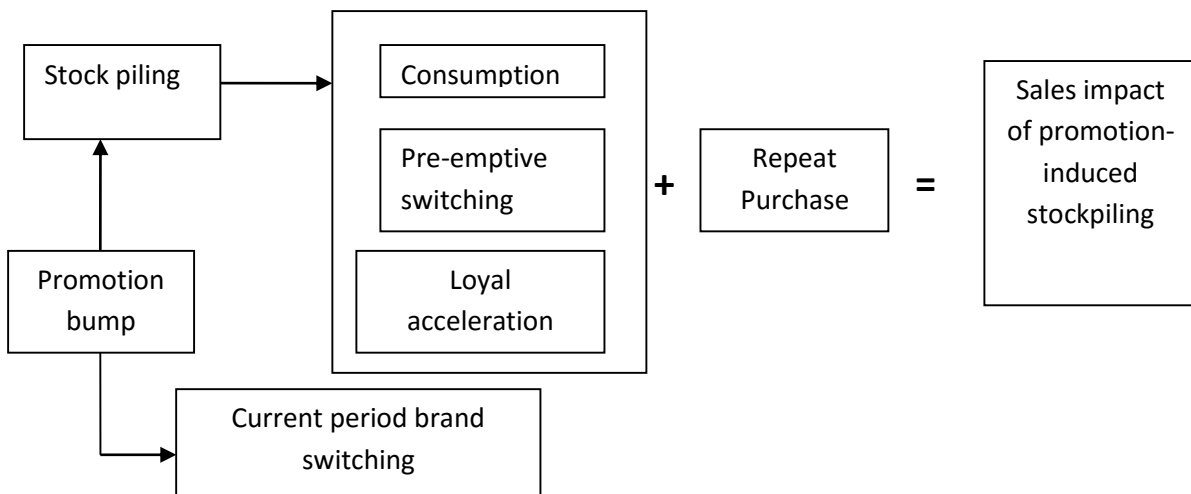
**Figure 2.2** A framework for quantifying the impact of promotion-induced stockpiling (Ailawadi et al., 2007)

Another important phenomenon arising from stock piling is the post-promotion dip, which is the reduction in the sales of the promoted item after the promotional period. Mace et al. (2004) have studied this phenomenon across ten product categories. They have shown that high priced products are more likely to observe post-promotion dip due to consumer's perception of the value of the promotion, as shown in figure 2.3. They conclude that a consumer's decision to stockpile or decelerate purchase is highly dependent on their perception of the value of promotion. They used store level data from 83 stores to estimate pre and post promotions dip using regression analysis. Choice of product category was dependent on its storability, share of shopping basket and the number of brands in that category.
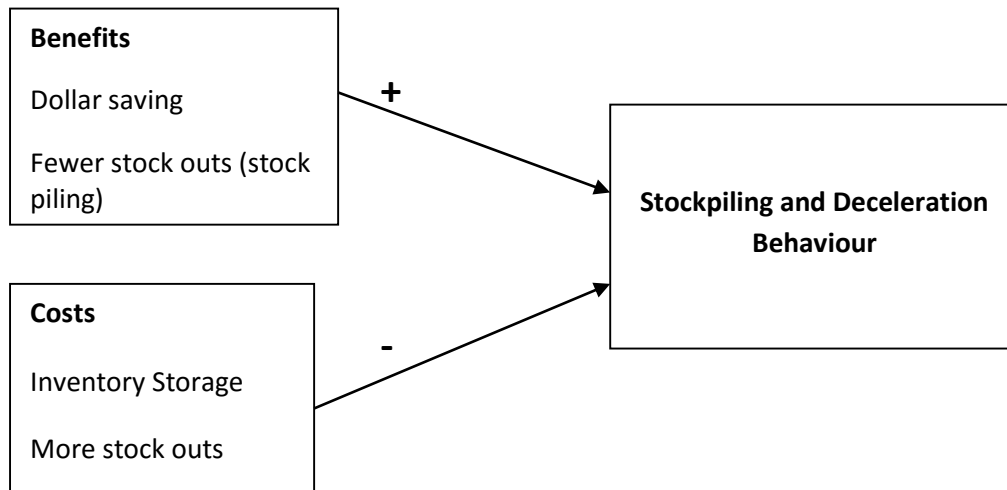
**Figure 2.3** Consumer's perspective of the costs and benefits of stockpiling & deceleration (Mace et al., 2004)

However, not all types of promotions result in purchase acceleration. Coupons and price discounts are shown to be more effective for purchase acceleration compared to free samplings (Aggarwal and Vaidyanathan, 2003). Kivetz et al. (2006) have shown that as the time remaining to receive the promotional goals become smaller, the more likely consumers are to accelerate their purchase, as their motivation to purchase increases. This also depends on the depth of discount and timings of promotions. Purchase acceleration is also associated with faster consumer re-engagement and retention (Blattberg et al., 1990).

Neslin et al. (1985) studied the impact of purchase acceleration in different consumer segments by examining different price cuts and the effects of coupons on consumer loyalty. They used two product classes (coffee & tissue) and scanner data to analyse purchase acceleration. Regression analysis showed that coupons increase quantity purchased but that the degree of purchase acceleration depends on the product category and the consumer segment. The main limitation of this study was the fact that the authors relied on data from just one store. They were also unable to distinguish between promotional responses to branded products compared to own-label.

Palazon et al. (2011) have shown that customers can postpone or accelerate the purchase of the promoted product depending on the perceived immediacy of the benefits from it. They

have shown that demographics, psychographics and shopping goals play an important part in this choice and recommended the development and monitoring of promotional strategies in line with consumer perceptions of the potential savings and additional benefits associated with a promotional purchase.

One weakness with all of these studies is the lack of consideration of situational factors at the store level during and after the promotional periods. For example, some shoppers may not respond to certain types of promotions at all, e.g. multi-buys, because of the small size of the household, the lack of storage space at home or the perishability of the product. Most of the empirical studies recognise the potential differences in promotional impacts across product categories but very few recognise the potential differences between distinct shopper segments and store types.

### 2.2.3 Category Expansion

Promotions can increase the value of the whole product category or simply the value of the promoted brand within the category. The former is defined as category expansion whilst latter is the result of brand switching. Category expansion results from an increase in the customer base of a product/brand, prompted by the promotional mechanic and maintained thereafter due to a perceived increase in consumer satisfaction with the promoted product, vis-a-vis the competition. Category expansion can occur within an existing range or may result from the introduction of a new product, the launch of which is supported with some form of promotional activity.

### 2.2.3.1 Existing product range

The expansion in an existing product category can be achieved by increasing its rate of consumption. Sales promotions have been shown to influence consumption by stimulating consumers to increase their usage. Pauwels et al. (2002) have reported a total of 27 percent category growth in two categories of soup and yoghurt during sales promotions. Quelch and Jocz (2010) found that the ability of a promotion to increase purchase frequency is conditional upon the seasonality of product demand, competitive reactions to promotional activity and the responsiveness of the supply chain (availability of inventory).

Putisis and Dhar (2001) studied the effectiveness of sales promotions on category expansion of 153 product categories across 59 geographical markets. They focused primarily on the share of national vs. private brands. They showed that promotions did increase the share of both national and private labels and their profitability was not at the expense of each other. However the effect of category expansion varies considerably between different product categories. For example, the sales of products with longer shelf life (e.g. bottled water and vinegar) expanded to a greater extent than the sales of products with shorter shelf life (e.g. spices and coffee). They also observed significant differences in category expansion between the geographical markets and between the different promotional instruments. These findings are significant in the context of this research, as they highlight the heterogeneity of promotional impacts. However, the sales data was highly aggregated and there was no consideration of different shopper segments within the different geographical markets.

Pauwels et al. (2002) observed the impact of promotions on both storable and perishable products over 2 years and showed that national brands had more drawing power both in the short and long term. They also showed that price promotions can induce non-category shoppers to make a purchase and so expand the product category. However, their data was limited to only 26 stores and that too was in mature markets so generalizing their findings over emerging markets with large areas is problematic. They were also unable to identify which promotional mechanic was most effective in generating category expansion. They suggested using store level data to overcome the dynamic and complex effects of promotional mechanics on consumer behaviours.

Haans et al. (2011) studied the effect of store size on the category expansion of promoted product belonging to 4 product categories in 103 stores across four chains. They conceptualize the effect of promotional depth, display support, feature support and quantity based promotions on category sales as shown in figure 2.4 below.
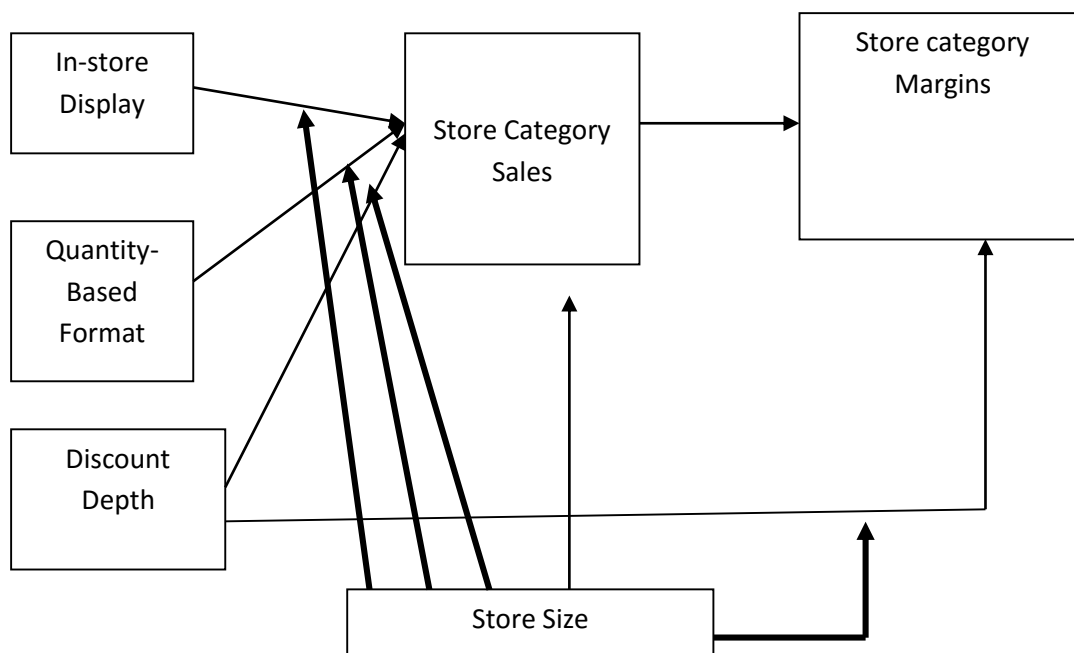
**Figure 2.4** Conceptual framework of effect of store size on category sales (Haans et al., 2011)

They showed that deeper discounts do not translate into incremental sales in larger stores, whereas in-store display does increase category sales. Similarly, larger stores benefit more from price cuts as compared to smaller stores.

The degree of category expansion also varies depending on the attractiveness of the promotional technique applied and the type of product (Chandon and Wansink, 2000). For example, a multi-buy offer may reduce future sales if the consumption rate is not increased, which is more likely with ambient foods, which benefit from a much longer shelf-life than fresh products.

It is clear from above that the evidence on category expansion is mixed and the reliability of the empirical evidence is questionable. What is most evident is that promotional impacts at the category level are mixed and vary according to a variety of factors, which supports the use of dis-aggregated data, of at store level and across shopper segments.

**2.2.3.2 New Product Introductions**

Sales promotions have been shown to increase the sale of a category by supporting the introduction of new products, which attract new consumers and prompt increased usage amongst existing consumers (Pauwels et al., 2004). This is especially beneficial for manufacturers, who generally stand to gain the most from introducing new products/brands, which often result in pure brand switching, which is of limited value to retailers (Ailawadi et al., 2007).

Nijs et al (2001) studied the long and short impact of price promotions on category demand especially for new products as shown in figure 2.5. They found that the category expansion effect of price promotions for new products is greatest for perishable goods categories. This suggests that, within the perishable goods categories, shoppers are perhaps more likely to experiment with the purchasing of new products when they are on promotion. In addition, existing shoppers will increase their use of (promoted) perishable goods while they are on promotion and switch to alternatives when the promotion ends. This reinforces the perception of promotions as exclusively impacting short term purchasing behaviour.
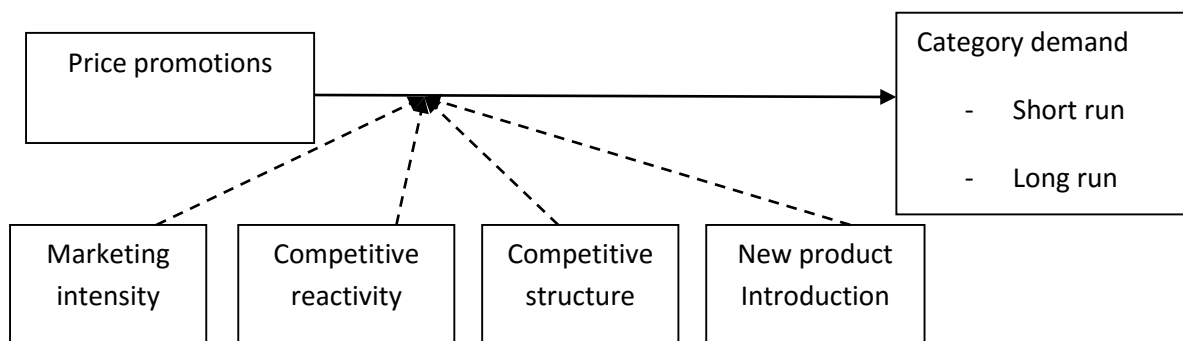


**Figure 2.5** Effect of promotions on category demand (Nijs et al., 2001)

They looked at 560 consumer product categories and discovered that short term promotional impacts on new products are not visible. Despite using a large number of product categories the authors acknowledged that due to the aggregated nature of the data they were unable predict consumer demand at store level, reducing the practical value of their findings.

Simonson et al. (1994) studied the effects of sales promotions and new product introduction

with the help of three case studies. They showed that consumers hesitate to buy new products on promotions as they perceive it as high risk and low value. Therefore it may lead to a decrease in sales as compared to mature products. However, these findings were based on the claimed behaviour of consumers surveyed, which may not be an accurate reflection of their actual behaviour.

All of these short term impacts are studied keeping in mind consumer demand and product attributes. There is much less evidence of the effects that consumer demographics and socio-economic factors have on promotional sales. This is surprising, as the catchment areas of stores are clearly not homogeneous and consumer demand is likely to have a strong influence on the success of a new product launch or the promotion of an existing product. For example, the impact of a sales promotion for a niche product in an area of affluent people is likely to be very different from the impact of the same promotion in an area populated by people who are price sensitive. These differences are likely to have implications for the design and perceived benefits of promotions for both retailers and suppliers.

### 2.2.4 Consumer loyalty

Performance of a product or brand in a promotional environment is measured by the quantity sold, the frequency of purchase and how both of these relate to competitive products (Ehrenberg et al., 2004). These loyalty related measures for a product or brand are also influenced by consumer motives and needs which are shaped by in-store displays, advertising and different promotional mechanics.

Liu et al. (2013) showed that repeat purchase (a proxy for loyalty) by the consumer during a promotional cycle can be due to two reasons. First it can be driven by attitude loyalty and secondly due to habit triggered by contextual cues. They used three case studies to show that attitude loyalty increase cross selling during promotions, whereas habit has the opposite effect and has a negative impact on sales. They therefore, recommended that promotions should be designed in such a way that they distinguish between habitual customers and loyal customers.

Bawa and Shoemaker (2004) showed that repeated purchase due to promotions can lead to incremental sales and improved market share for brands. However, the magnitude of the increase varies considerably between products even within the same category. They performed two controlled experiments to show that repeat purchase has a long term affect which can last more than 12 months. They showed that repeat purchase is closely linked with the cannibalization from other brands and category expansion within the same product category. However, controlled experiments are not a true depiction of the 'real' shopping environment, in which multiple factors can influence consumer choice. Similarly, methods for accessing repeat purchasing behaviour should ideally be based on the analysis of actual sales rather than claimed or reported behaviour.

Kim et al. (2014) studied the repeat purchase behaviour of consumers in the automobile industry and showed that age, promotional mechanic and type of product strongly influence the consumer decision to repeat purchase a product. They used purchase date for 1000 customers along with demographic information (age, location, and gender) and used regression analysis to show that price and timing along with other marketing activities impacts repeat purchase.

**Summary**

This review of the marketing literature has revealed significant gaps in our understanding of consumer reactions to promotions. Consistent reference has been made to the heterogeneity of consumer response and the need for greater dis-aggregation of data, yet the majority of empirical studies rely on purchase data that is either highly aggregated or based on claimed rather than actual behaviour.

Most of the studies acknowledged that the promotional environment is a complex and influenced by a variety of factors that relate to the store (situational factors), the product (shelf-life and novelty) and consumer characteristics (shopper segments). However, the majority of studies have a very narrow focus and fail to accommodate the multitude of factors that come to play in the promotional context.

Having review the marketing literature as it relates to promotional impact, the next section switches attention to the supply side and presents a review of the operations research relating to promotions.

## 2.3 Promotional Planning Models

In general, objectives are goals often stated in numerical terms. Strategies are general approaches to achieve these goals. Thus, in the context of promotions in the FMCG sector, promotional planning includes the establishment of targets for short term sales impacts – increasing trial, repeat purchase, weight of purchase – the promotional vehicle for achieving the stated objectives – price discounts, multi-buys – and the co-ordination of demand and supply – to ensure the plan can be delivered.

The main focus of promotion planning is the link between the promotional plan and the marketing plan, with promotions being just one part of the marketing mix (Voss, Tsikriktsis and Frohlich, 2002). This process should be interactive and must be properly planned, organised and integrated into the establishment marketing plan. This results in promotional planning often being undertaken in isolation, with limited interaction between marketing managers and supply chain managers (Kurata and Liu, 2007). This is one of the major problems identified with promotional planning, as marketing managers tend to focus on maximising sales, which in the case of promotional planning involves the build-up of inventory, whereas supply chain managers are often focussed on  minimizing the cost, which is invariably associated with reducing stocks and avoiding stockpiling, the impact of which can be mitigated by increased supply chain agility, which cannot be easily achieved without prior investment and supply chain re-structuring.

Moreover, reducing variability in demand is widely associated with increased efficiency yet promotions inject uncertainty and volatility in demand which is generally unwelcome by supply chain managers. This disconnect between the marketing function and the supply chain function is evident from the literature but receives inadequate attention – most models 'assume away' the implications of this disconnect (Ramanthan et al., 2010).

Demand information is an important part in the planning process of promotions. It has direct effects on production scheduling, inventory control and delivery plans (Lummus et al., 2003). Sudden changes in customer demand during promotions act as a shock which stress the supply chain (Kogan & Herbon, 2008). Taylor and Fearne (2009) showed that in promotions of fresh product, linking demand data with upstream processes can reduce the impact of variable demand. They also showed that the lack of information sharing can result in higher productions costs, inventory levels and wastage rates.

Zhao, Xie and Zhang (2002) found that order co-ordinating and information sharing significantly impact the supply chain performance in terms of service level and costs. The value of information sharing and co-ordination depend on the demand and capacity constraints. The relative costs of supply chain (RTC) along with the relative costs of retailers (RTCR) and suppliers (RTCS) is high in no information sharing (NIS) as compared to demand information sharing (DIS) and order information sharing (OIS) as shown below in Figure 2.6.
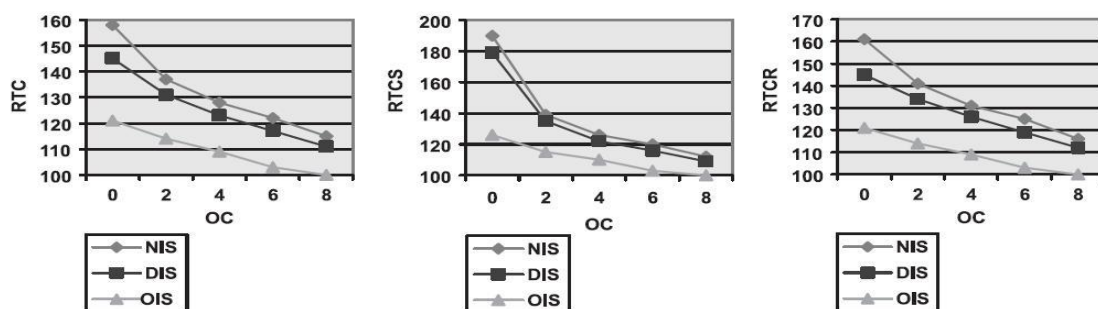


**NIS** = No Information Sharing          **OIS**= Operation information sharing

**DIS**= Demand Information Sharing   **OC** = Operating cost

**Figure 2.6** Overall performance of supply chains in information sharing and order coordination scenarios (Zhao et al.,2002)

As the level of information sharing for promoted products increases, promotions move from less profitable to more profitable. Quinn et al. (2007) showed that information sharing and co-ordination increases the ability of a supply chain to react to the sudden changes in the demand that are induced by promotions. This is particularly important in a promotional

environment where consumer demand is volatile and uncertain, as is the case with supermarkets and fast-moving consumer goods, where the availability of substitutes (stores and products) is particularly high.

With shorter product life cycles and increasing use of sales promotions, demand forecasting has become more difficult. This leads to inaccurate forecasts and consequently more stock outs during promotions (Ali et al., 2009). These stock outs have implications for primary production, manufacturing and supply chain management as availability is managed through a combination of higher production and higher levels of buffer stocks along the supply chain, often with damaging consequences for profit margins. The key principal of supply chain management is to build measures, decisions and strategies based on their effects on entire supply chain. Forecasting sales collaboratively by incorporating supply chain measures will reduce stock outs and consequently increased profit margins.

Syntetos and Boylan (2010) have shown that accuracy of forecast has equal importance for inventory cost minimization and improve customer service levels. They proposed applying this in the promotional environment under certain assumptions. Collaborative supply chain forecasting supplements baseline historical information with current events and trends. This reduces the reliance on assumptions and enables more evidence-based decision-making. This should ensure that all functions are working together under one single plan and supply chain strategy. Its effects can be seen in lower inventory levels, lower production costs and lower incidence of product obsolescence.

Larson et al. (2003) define collaborative promotions as 'when two or more supply chain parties plan a number of promotional activities by synchronising the forecasts so that production and replenishment processes are determined'. The enablers for these types of collaborations are strong relationships and common goals with clear objectives for specific promotional activities.

None of the above studies considered the heterogeneity of consumer demand in the promotional planning process, the differential impacts of different types of promotions or

the implications that these might have for supply chain management.

The market should be segmented based upon consumers with similar demand characteristics. The customer segment should be measurable and of sufficient size to justify a particular promotional event. Demand characteristics can be influenced by socioeconomic, geo-demographical and psychographic factors and will in turn influence the impact the promotion has at store level, as shown in figure 2.7.
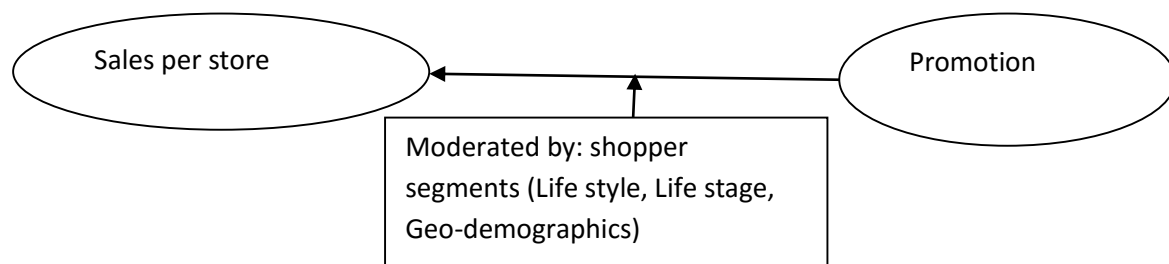


**Figure 2.7** Impact of promotions on sales moderated by customer segmentation (Felgate et al., 2012)

Promotional planning needs to involve both marketing and operations management, so that projected changes in demand can be accommodated by production and distribution. Information sharing between departments will help reduce demand uncertainty during sales promotions. Collaborative information sharing will help in establishing shared objectives between retailers and suppliers. This alignment of system objectives will also improve visibility across the supply chain, from the production of the product to the allocation of shelf space

Consumer information sharing and order coordination should reduce the cost of promotions and increase their effectiveness, to the benefit of retailers and suppliers. Sales promotions can change the nature of demand from stable to unstable, due to the reaction of competitors (stores and brands). The more detailed (dis-aggregated) the data the more likely the stakeholders involved are to make the right decisions regarding the choice of promotional mechanic and the target market(s) and the right decisions regarding implementation (store allocation and replenishment).

A wide range of mathematical and statistical methods have been used promotional planning literature. Little (1975) was the first to present a comprehensive promotional planning model (BRANDAID) as shown in figure 2.8. It has a modular design which allows for the addition and deletion of different activities at different stages.
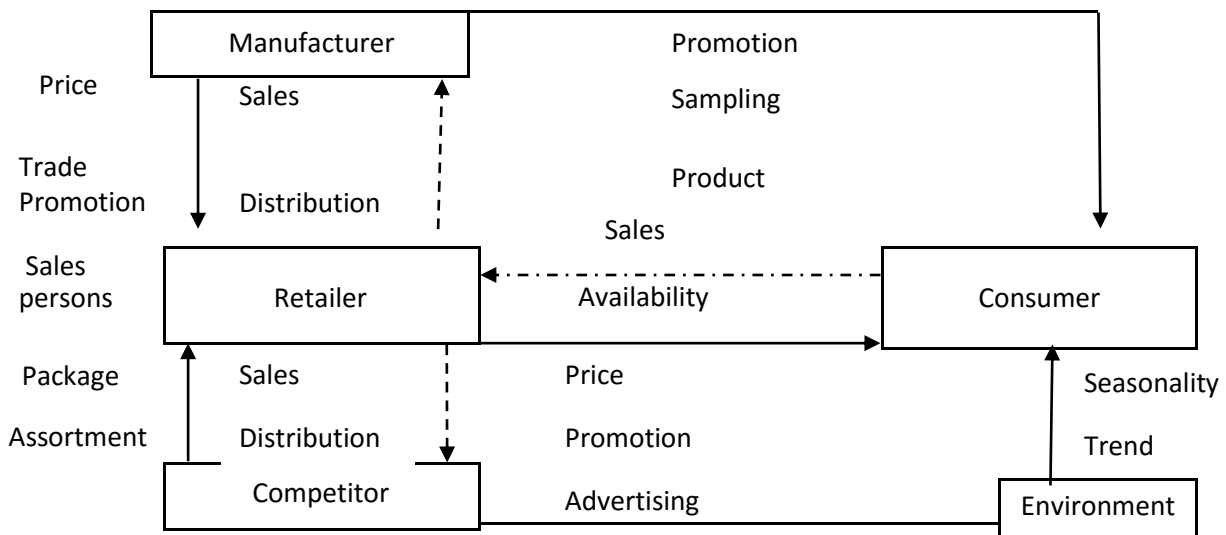


**Figure 2.8** Promotional Planning Model (BRANDAID) (Little, 1975)

This model was able to capture the dynamic effect of promotions by capturing any increase in sales during promotions and decrease in sales just after the promotion. It also considers the cannibalisation effect from other brand sales along with promotions tracking. It considered different bumps and dips for different type of promotions. It also has the ability to evaluate different marketing plans. This evaluation helps in identifying the change in the sales which can be supported by subsequent additional promotions as shown in figure 2.8. This was also an important application in the field of budgeting of sales promotions. It considers promotions as part of a marketing plan and so considers the effects of other factors like advertising and assortment on the outcome of promotional objective.

However, during the practical application of this model, different problems were identified. Package size changes, price changes and production constraint hampered the promotional planning but these changes were later incorporated in the model to make it more application oriented.

Despite being a comprehensive model it was designed work with aggregated sales data. Similarly, on the supply side the model does not distinguish different store formats or the size of store, which can have a significant impact for stock allocation and replenishment.

Neslin and Shoemaker (1983a) designed a coupon promotions planning model. They focused only on one type of promotion (couponing), as shown in figure 2.9 below. It was designed to analyse the actions of consumers, manufacturers and retailers. This model captures the consumer response to the promotions by calculating the repeat purchase, acceleration in product category purchase and brand loyalty. It helps managers to integrate their own judgments with known empirical relationships in deciding about the alternative coupon promotions. It also calculates the profit based on the net impact of all actions of actors on sales promotions. It was subdivided into three sub models. These are for capturing the response of the consumer to coupon promotions, the retailer's response to trade deals and the consumer's response to in-store promotions.
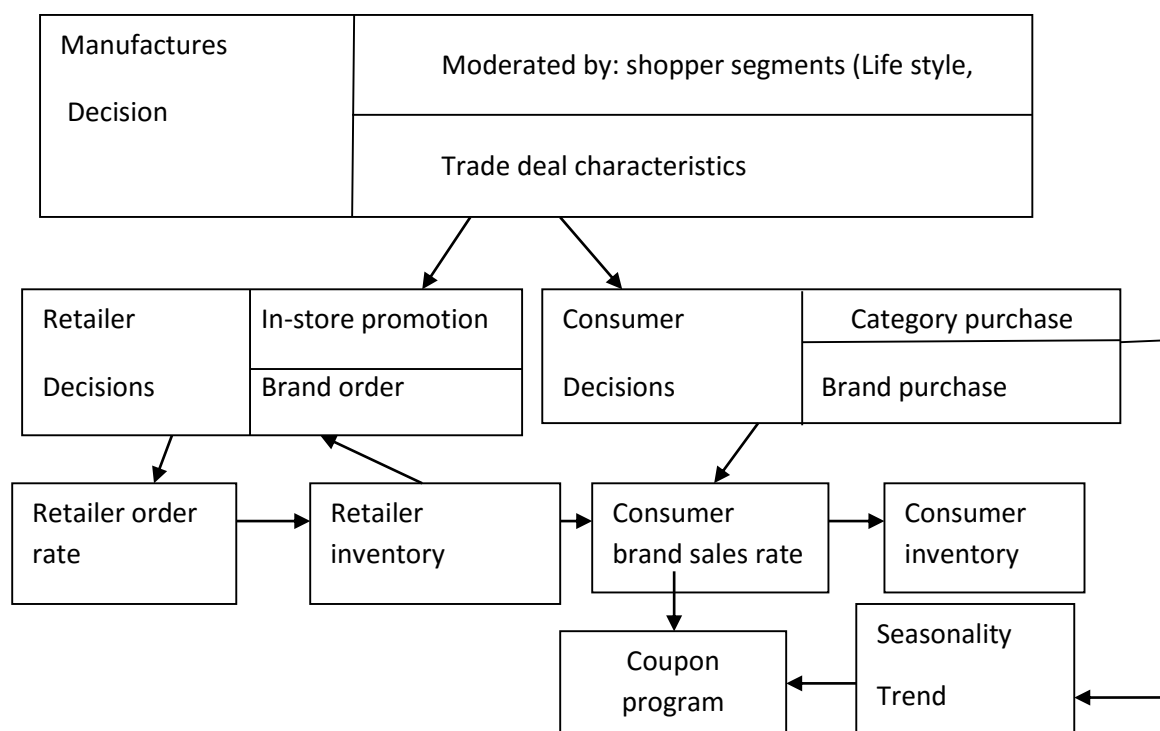


**Figure 2.9**   Neslin-shoemaker coupon model (Neslin et al., 1983)

There are significant limitations around design and application of this model. Its design was

strongly influenced by managerial judgements which alone limit its generalization and it was based on one product so the ability to take into account different product characteristics was excluded. Another significant limitation was the lack of link between customer segments and inventory levels which may result in a mismatch between demand and supply.

Both of these models seek to integrate the demand and supply side of the promotional cycle. The common weakness is the failure to link consideration of consumer demand with individual stores, resulting in a fundamental weakness when it comes to the execution of promotions, as stock allocation remains aggregated

Another important model for forecasting promotions was PromoCast, illustrated in figure 2.10 below. It gave a promotion-planning solution at the tactical level and its main aim was to minimize both stock-outs and inventory costs for retailers. This model has the ability to take into account the interaction of different variables at store level.
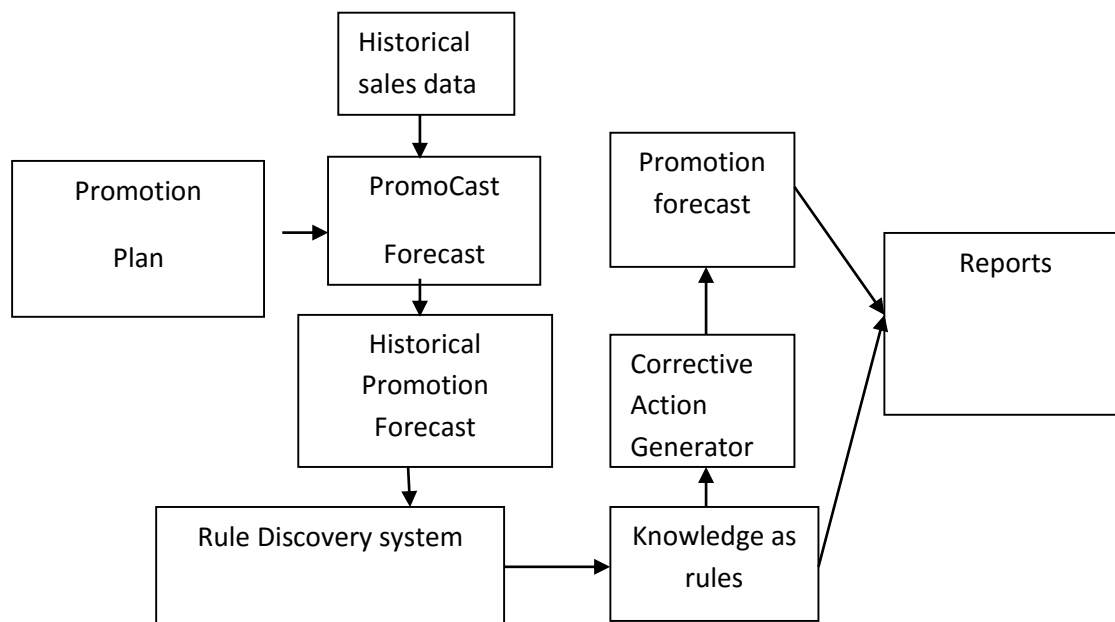


**Figure 2.10** PromoCast Design (Cooper et al., 1999)

Therefore, it was able to reduce forecast error thus improving inventory planning. The forecasts are based on historical data at store level but the growth of promotional activity and competitive behaviour across categories reduces the relevance of past behaviour when

predicting the future, which is a major weakness in this approach.

All of the above models suffer significant limitations due to the assumptions they make and the nature of data used. The authors have tried to simplify complex relationships between demand and supply by assuming that consumer segments behave similarly and supply chains are designed for cost minimization. The reality is more likely that different segments react very differently requiring the supply chain to be agile in its response, which invariably comes at a cost, which none of these models acknowledge or incorporate. Another significant limitation is the sources of information used to build these models. As access to disaggregated level of data is costly and requires considerable resources and buy-in from senior managers, the authors of these models have used aggregated data which makes these models more applicable for strategic planning than operational execution. Another weakness in the above models is the absence of a performance feedback loop. No measure was devised to capture the feedback of sales promotions so that the promotional objectives could be adjust in light of the outcome.

Clearly there is a miss-match around the interface of demand and supply chain due to lack of information sharing and oversimplified assumptions about consumer demand. This causes problems for stock allocation and shelf replenishment, which are discussed in the following sections.

### 2.3.1 Demand and supply chain coordination

The synergies between supply chain management (SCM) and marketing have been widely acknowledged. SCM focuses on efficient supply and tends to be cost oriented; marketing is more concerned with differentiation and revenue generation, with the focus on demand (Jüttner et al., 2007).Together they determine the company's profitability.

Ettouzani et al (2012) used case studies of seven major UK retailers and four multinational manufacturers to study the issues of supply and demand during promotions in the context of shelf availability. They appreciated the fact that promotional studies are divided into two streams. The first stream is demand led and geared towards identifying consumer response to promotions. The second stream is oriented towards the understanding of its supply chain.

They observed that demand for promotional products is difficult to forecast and manage at all stages of supply chain but especially the final stages. They identified 32 problems affecting both retailers and suppliers during promotions and grouped them into eight themes as shown in figure 2.11 below.



■▮ **Demand & forecasting** ■▮ **Replenishment** ■ **Production** ■ **Distribution**
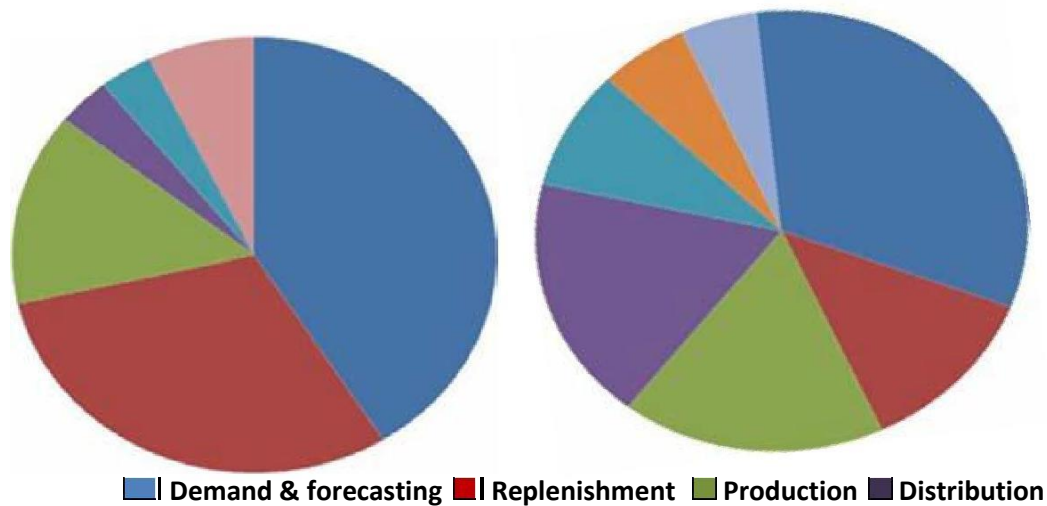
**Figure 2.11** Key demand and supply chain problems for manufacturers and retailers during sales promotions (Ettouzani et al., 2012)

It is clear from the figure above that demand forecasting and replenishments are the two major themes emerging from their work. Both retailers and suppliers express concerns about high demand fluctuations during promotions and the accuracy of forecasts for inventory management. This qualitative study rightly pointed out the issues along the interface of demand and supply but they were unable to suggest novel forecasting and distribution methods for mitigating demand upsurge during promotions.

Managing the demand chain is fundamentally different from managing the supply chain. It requires the customer as its starting point instead of its final destination. Esper et al. (2010) presented a conceptual framework for integrating demand and supply management as shown in figure 2.12. They contend that by simultaneously considering market development from upstream and downstream perspective improvements can be made in both the efficiency (cost/waste) and effectiveness (sales growth) of promotions
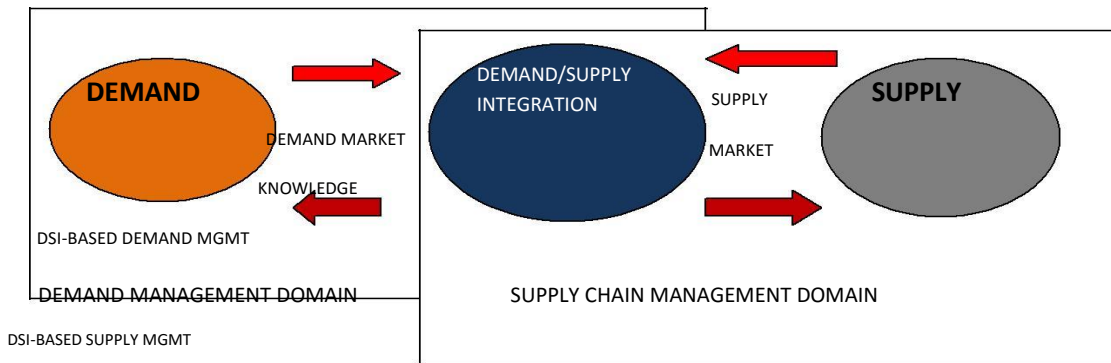
**Figure 2.12**  A conceptual framework of demand and supply integration (Esper et al., 2010)

Arshinder et al. (2008) developed an overview of supply chain coordination through a systematic review of the literature on supply chain coordination, which is summarised in Figure 2.13. Forecasting, production, distribution and inventory management are identified as important factors at the interface between supply and demand
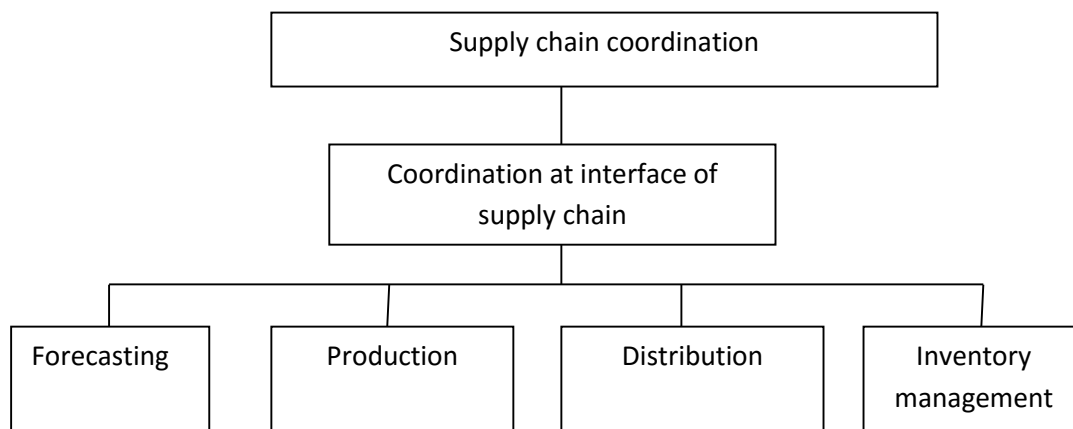


**Figure 2.13** Overview of coordination of supply chain interfaces (Arshinder et al., 2008)

It is evident that forecasting consumer demand is one of the most important factors affecting supply chain coordination. This becomes particularly critical in the context of promotions where forecasting errors can lead to promotional waste or stock outs resulting in loss of market share and customer loyalty.

Peidro et al. (2009) reviewed the literature related to supply chain planning methods under

uncertainty. They identified consumer demand as the highest source of uncertainty in supply chain planning. Figure 2.14 represent the three dimensions of SC planning under uncertainty.
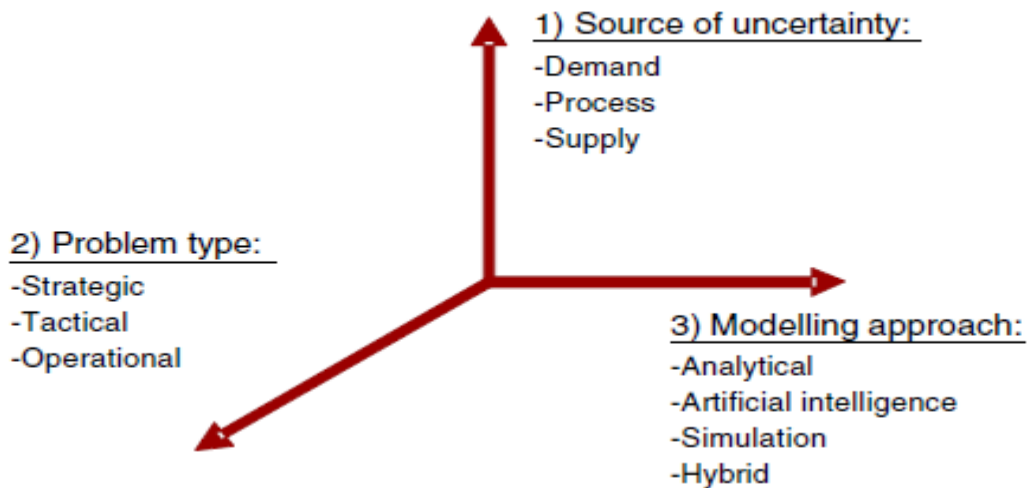


**Figure 2.14** Three dimensions of the supply chain planning models under uncertainty (Peidro et al., 2009)

This is an important study as not only does it highlight the source of uncertainly but it also shows the choice of methods available to address them. They noted that analytical models are used in most of these studies but they are not powerful enough to address the complex scenarios as initial restricting hypothesis limit their applicability. They favoured hybrid models which use simulation and optimization to address the complexities of demand. The challenge in hybrid models is coordinating the information generated from both models. Another important observation of this study was that the quality of data used to forecast demand in the presence of uncertainty is of vital importance.

Clearly inaccurate demand forecasting can have catastrophic impacts on stock allocation and shelf replenishment, causing major problems at the interface of demand and supply chain during promotions. Each of these issues is further discussed in detail below to see how information sharing can help to mitigate them.

**2.3.1.1 Stock & Space allocation**

The supply chain management perspectives on promotions focus primarily on stock

allocation, replenishment systems and the management of demand amplification during promotions.

Production and distribution are of critical strategic importance in the retail industry. They require the co-ordination of consumer demand with the availability of supply and warehousing facilities.

Gebennini et al. (2009) used a cost based model to explore tactical and operational integration via inventory control, customer demand assignment and service levels as shown in figure 2.15 below.
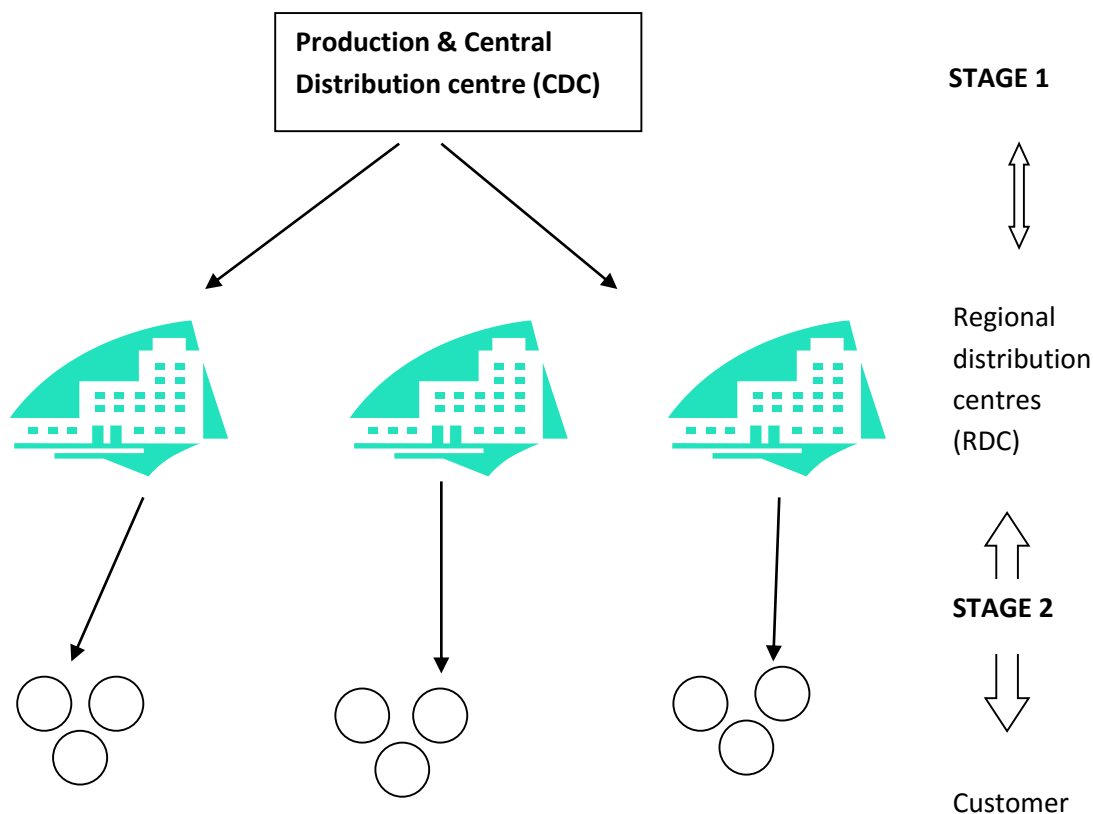


**Figure 2.15** Two stage distribution system (Gebennini et al., 2009)

They used scenarios of more than 200 customers with the help of mixed integer non-linear programming to identify the most important factor facing the supply chain is managing of consumer demand at different locations. However, their model does not take into account

the uncertainty of consumer demand and the optimisation of inventory management, which are critical factors in the context of promotions.

Desmet et al. (1998) showed that allocation of shelf space in the stores is influences by multiple external factors, including promotions, seasonality and variation in category demand for different products. They proposed two types of space allocations, as shown in figure 2.16 below. The first approach is top down and based on the computation of profit, which drives space and stock allocation in stores. The second approach is bottom up and based on estimated consumer demand, guided by operational concerns of store managers.



Level of the store

Department Level

Group of product

Categories level

**Product Category Level**

Sub-Product category Level

SKU level
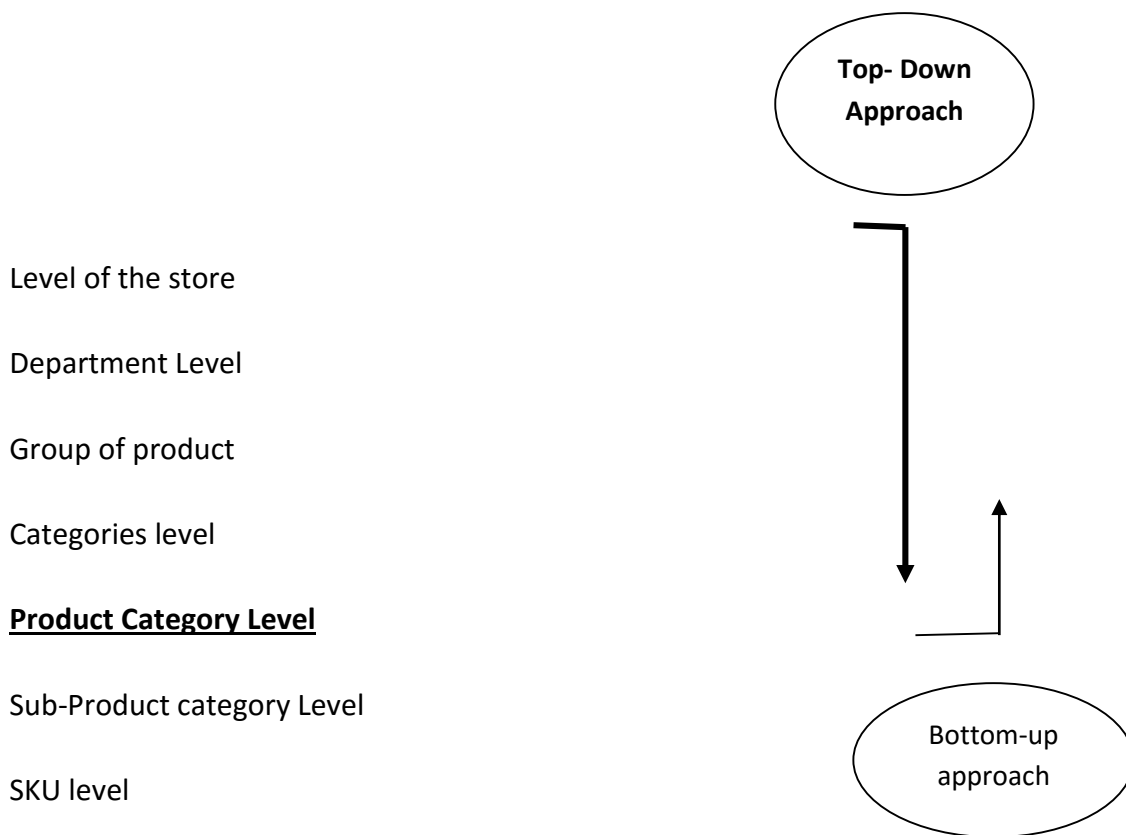
**Figure 2.16** Hierarchical approaches to managing space allocation (Desmet et al., 1998)

Neither approach takes into account adequately the variability of product categories and uses simplified assumptions about the sales process. These lead to estimation errors in product space allocation. In order to address this they propose a conceptual framework to study the impact of store attributes and category attributes on space allocation in stores as shown in figure 2.17 below.
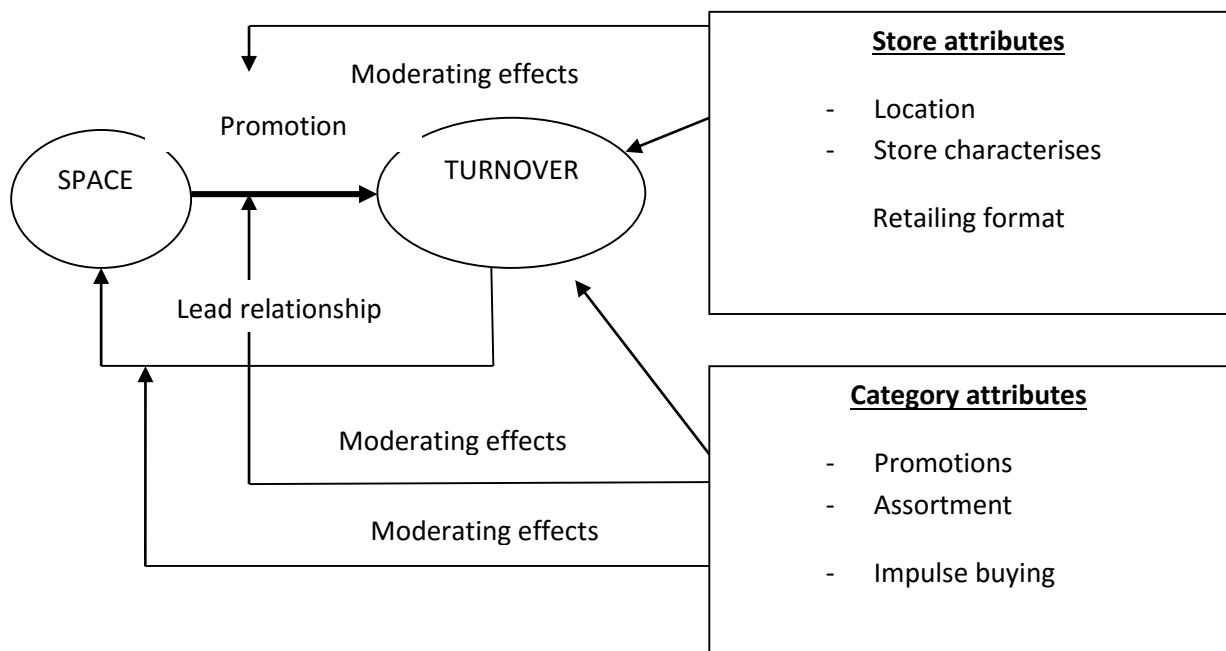
**Figure 2.17** Conceptual frameworks for space allocation and sales (Desmet et al., 1998)

They used a database of 200 stores from a French supermarket chain and observed that promotions have strong influence on sales and on the space allocation of stores. However, they observed a weakening in this relationship at sub category levels. They showed that space allocation varies considerably within different categories, emphasising the importance of the differential response of shoppers to promotions in different product categories. The limitation of this study is the focus on one store format, as consumer response to promotions in a hypermarket are likely to be different significantly from responses in a convenience store.

Another important study looking at store performance during promotions was done by Lam et al. (2001). Their model (see figure 2.18) captured the factors affecting store level performance and included the weather as an uncontrolled variable.

**Controllable Variables**

| |
|---|
| Price |
| Promotions |
| Operation policies |
| Location |
| Store design |

**Store Performance**

| |
|---|
| Front traffic |
| Average spending |
| Store entry ratio |

**Uncontrollable variables**

| |
|---|
| Weather |
| Consumer demographics |
| Seasonality |
| Days of the week |
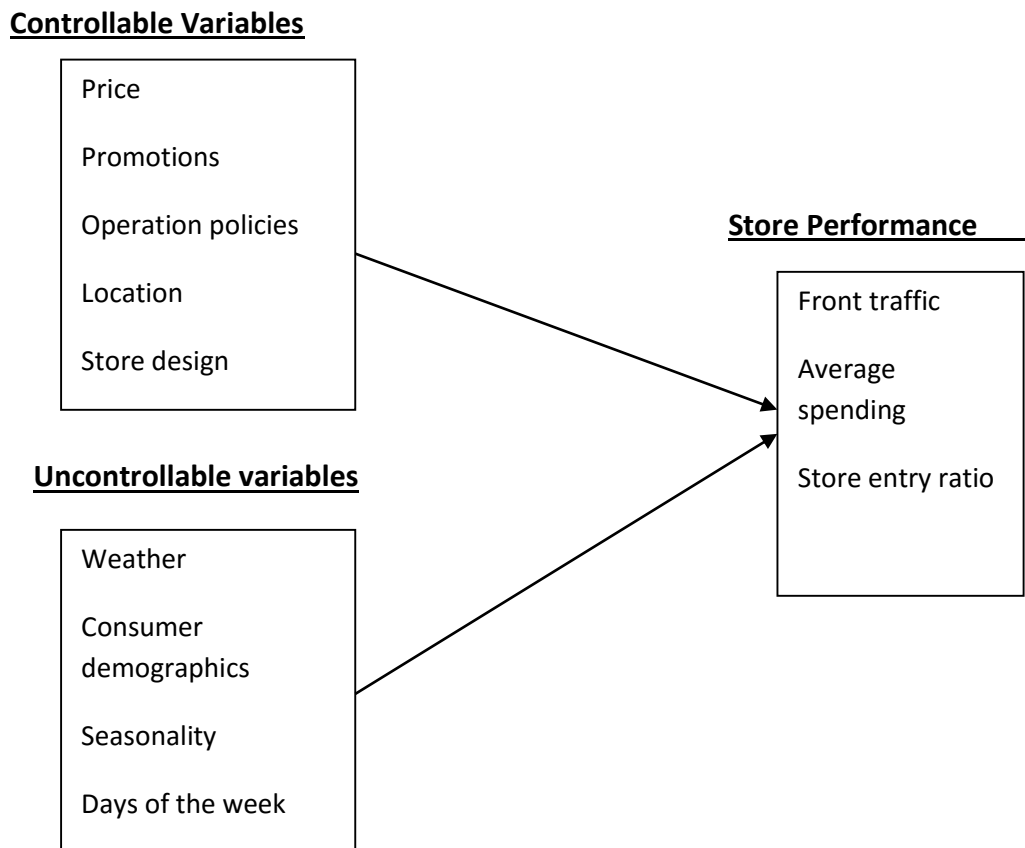
**Figure 2.18** Factors influencing store performance during promotions (Lam et al., 2001)

They showed that weather has a positive effect on the store performance but it strongly depends on the type of product promoted along with consumer demographics and store location. Another interesting conclusion of this study was that clearance promotions decrease front traffic of stores, whereas store wide insert promotions increases it. Therefore price promotions have both positive and negative effects on store performance. They showed that although promotions convert store visitors into buyers they it also lower their expenditure levels which is not good for overall store performance in long term. They conclude that inventory planning is a critical success factor over which suppliers and retailers have control and which can be used to ensure adequate stock is available where demand is greatest and subject to two critical factors outside of their control - the demographics of shoppers at a particular store and the weather.

Ramanathan et al. (2010) showed that seasonal factors had a significant impact on consumer demand during the promotion of soft drinks in the UK. They used temperature and weather as proxy measures for seasonal variations (see Figure.2.19)
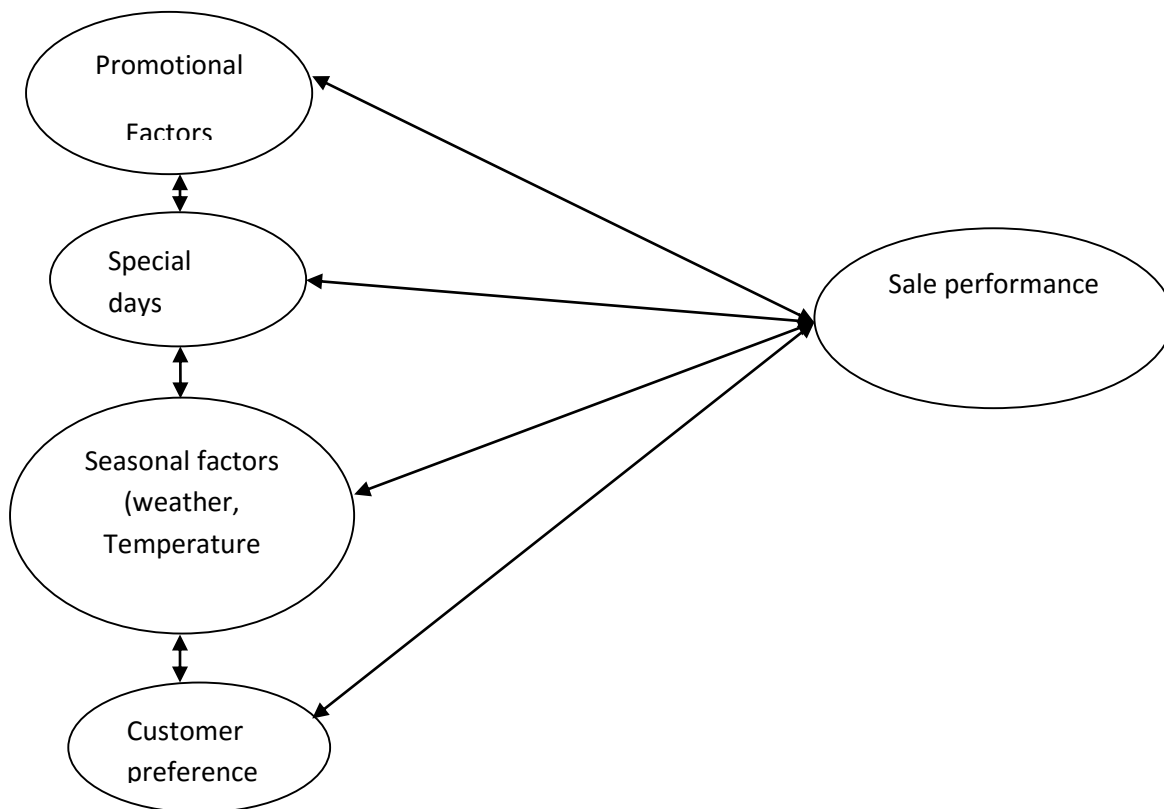


**Figure 2.19** Demand structures of soft drinks during promotions (Ramanathan et al., 2010)

They showed that promotions can distort profits heavily if effective factors impacting demand were not considered. Seasonal fluctuations along with variations in the weather were shown to impact inventory levels in stores and increase the risk of stock-outs during sales promotions. They conclude that weather is significant external factors that can have a significant impact on promotional sales, which they also believe will vary from one category to another.

These studies highlight the importance of weather during the planning and execution of promotions at store level. They also show that an appreciation of consumer demand at the store level is critical for maximising promotional sales.

Borin et al. (1995) showed that retailers have to make difficult decisions about the allocation of stock, as shelf-space is limited and the number of products continues to grow. They argue

that the shelf management models retailers' use suffer from two problems. First, due to the complexities of consumer demand and product attributes, models are simplified and the derived solutions are inaccurate. Secondly, there are significant numbers of parameters which can influence space allocation but their impacts are not estimated separately, resulting in additional estimation errors. They showed current shelf management tools neglect issues around stock outs, especially during promotions. This leads to brand switching that can range from 6 percent to 83 percent depending on the product category. They used ketchup category data from local supermarket and used past management judgement to show that estimation errors in shelf allocation leads to loss of return on investment (ROI) and final shelf arrangements.

Musalem et al. (2010) showed that as the number of out-of stock products increase the percentage of lost purchases also increase (see figure 2.20 below).
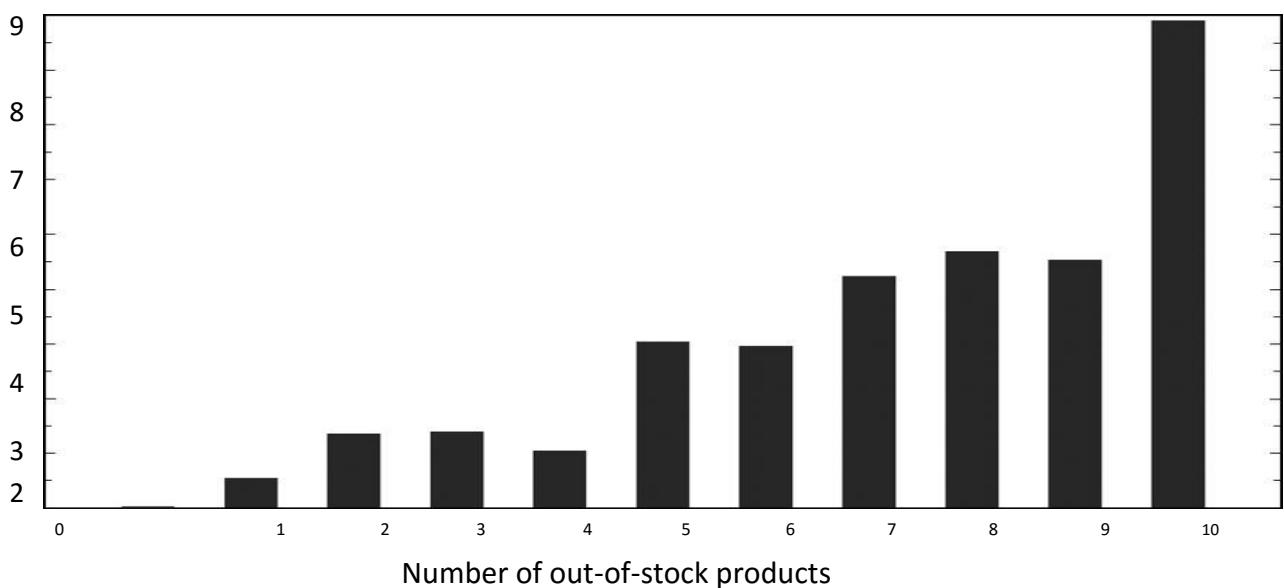


**Figure 2.20** Percentage of lost Purchases Vs. number of out of stock products (Musalem et al., 2010)

Thus, it is evident from these space allocation studies above that there is not enough level of detail in the information used around product categories, customer segment and store formats in the current space management system.

The next section explores how shelf replenishment affects stock allocation and how information is shared among stakeholders during this process.

## 2.3.1.2 Shelf replenishment

Gruen et al. (2002) studied the extent and causes of out of stock situations in the retail environment by examining 32 fast moving consumer goods product categories across 29 countries. They showed that out of stocks on promoted items were higher than non-promoted items in general by a 2:1 ratio (promoted vs. non-promoted out of stock). They isolated five mains causes and showed that shelf replenishment at the store and the distribution centre were the biggest reasons for out of stock items in fast moving consumer goods, as shown in figure 2.21.
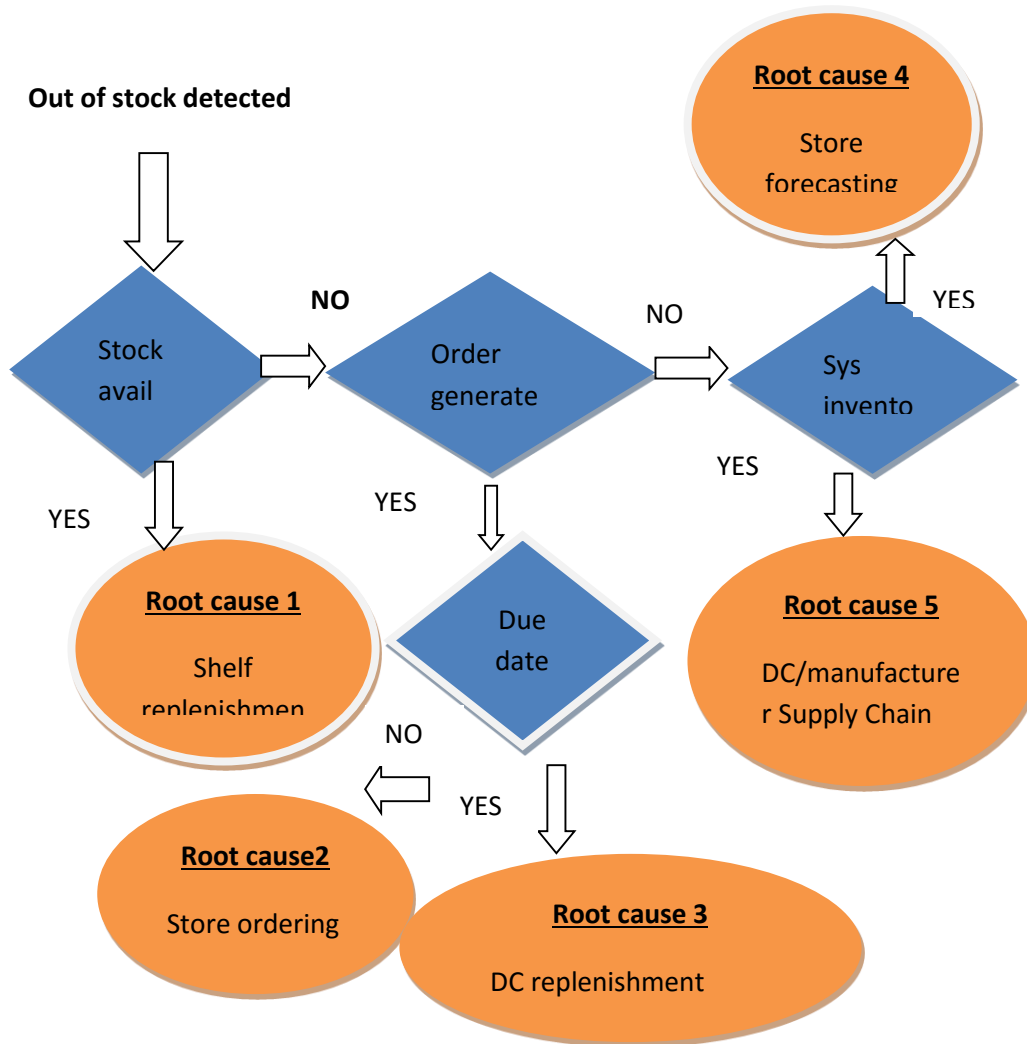


**Figure 2.21** Root cause analysis flow chart of out of stock (Gruen et al., 2002)

Broekmeulen et al. (2004) obtained replenishment and sales data from 50 retail stores to study the assortment policies of retailers. They observed that replenishment is a non-linear cost for retailers and improved coordination mechanism from operations and marketing can reduce excess shelf space significantly. They showed that handling of stock at the back store is the highest contributor of costs to the retailer, as shown in figure 2.22.
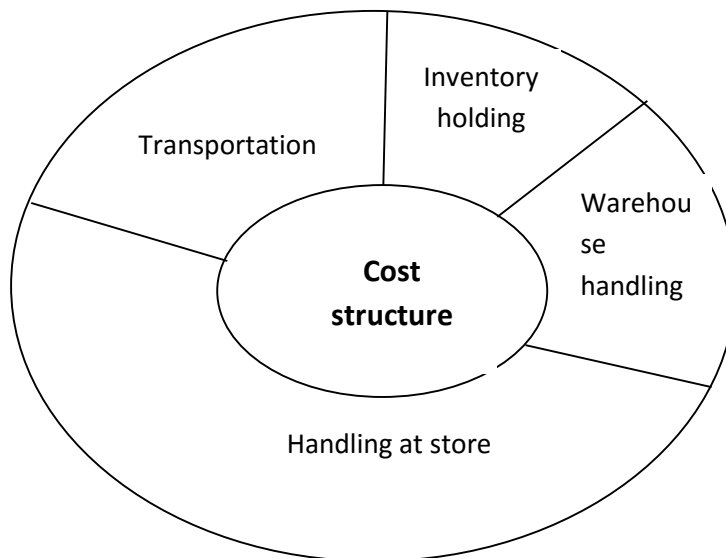


**Figure 2.22** Cost structure at a retail chain (Broekmeulen et al., 2004)

They studied replenishment from marketing and operations perspective and highlighted assortment, location and allocation as key areas in marketing and displayed inventory, demand and pack size as critical factors for production and distribution. They strongly advocated greater co-ordination between marketing and supply chain operations to reduce the costs from central warehouse to store. They suggested that replenishment policies need to be studied in more detail especially during high demand periods, when systems are under greatest stress.

Buzzell and Ortmeyer (1995) studied traditional merchandising and distribution systems between retailers and suppliers (figure 2.23) and measured their business performance. They showed that if suppliers have information about consumer characteristics they can help retailers with product assortment decisions and this will help both retailers and suppliers to improve performance. They advocated the need for joint replenishment efforts in distribution and store management. This joint work is strongly dependent on the merchandising category and the accuracy of forecast, which as already highlighted can be

seriously affected by promotions. They acknowledged that promotions create spikes in demand requiring retailers to hold more safety stock but that this can be minimized through greater collaboration between suppliers and retailers.
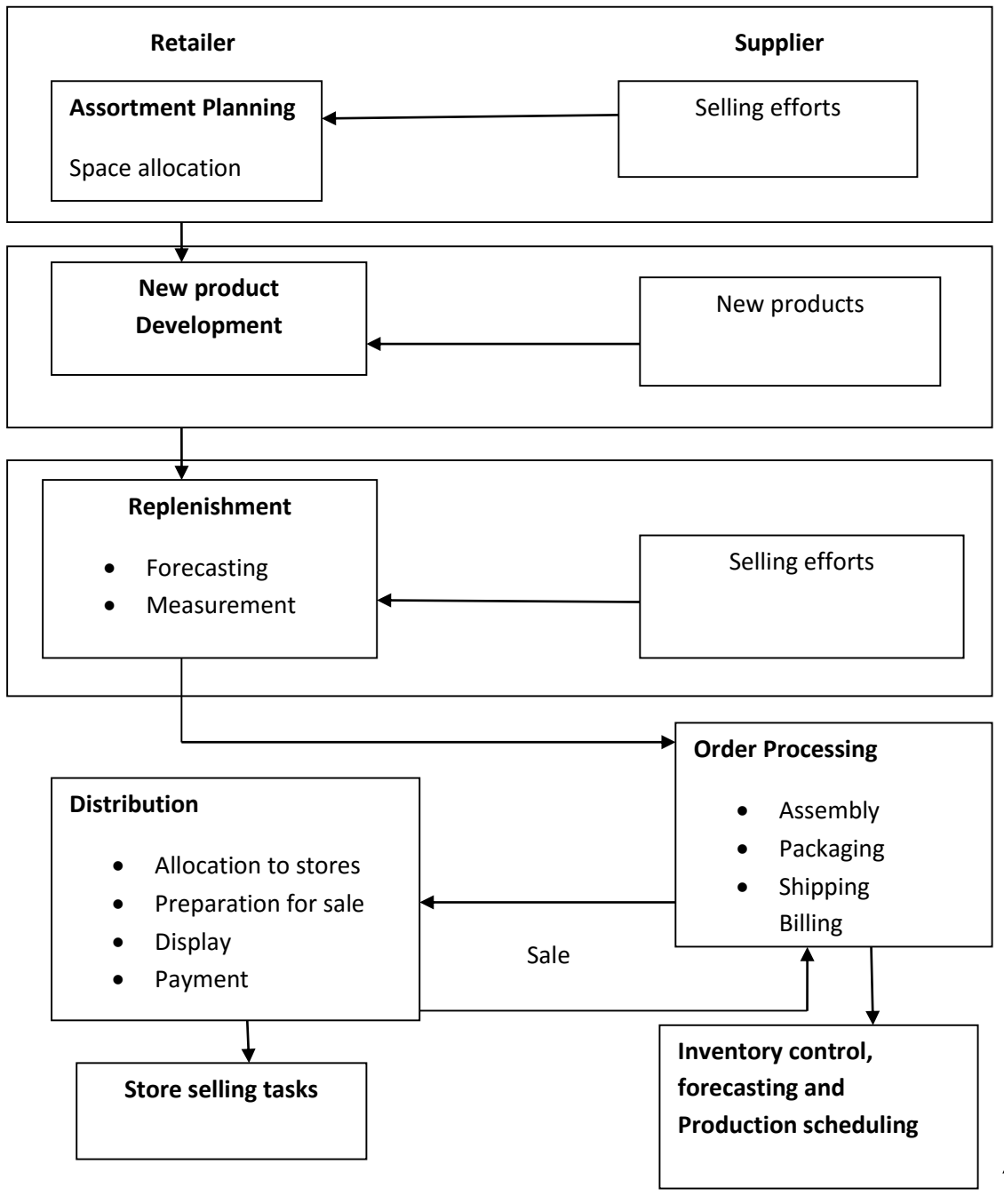


**Figure 2.23** Traditional merchandising-distribution process (Buzzell et al., 1995)

It is clear from the above studies that if suppliers have more information visibility during promotional planning process then they can help retailers to manage inventory more

effectively. However, as already noted the objectives of retailers and suppliers are not always aligned, which often makes effective collaboration difficult to achieve in practice.

The literature on space allocation and replenishment of sales promotions reveals that managing space on shelf becomes an acute challenge for store managers. This is defined as the 'last 50 yards' which is the most critical part of the supply chain.

Stock allocation and replenishment can be improved by better coordination through information sharing between suppliers and retailers. Detailed information about consumer demand at store level has the potential to reduce stock outs as it gives both suppliers and retailers the visibility for making accurate and timely decisions about shelf space and stock allocation. The lack of collaboration results in less information sharing and an increase in inventory levels at every stage of the supply chain. This phenomenon is called the Bullwhip effect which significantly impacts demand and supply interface. The next section will review the literature about this phenomenon and the effect of demand amplification during promotions.

### 2.3.2 Bullwhip effect & Demand amplification

The Bullwhip effect is the distortion of demand information which induces chaos in the market and demand by a thousand times the normal demand (Wilding, 2001). It is caused by poor information flow and interventions that create uncertainty and volatility in demand In order to reduce the level of chaos during the promotional period, both the supply chain and marketing have to work in synchronisation with each other.

As demand information is communicated back through the supply chain, there is a systematic demand distortion as information moves away from the end consumer (Cho and Lee, 2012). This effect may cause backlash by over ordering to take advantage of discounts during promotions (Duc et al., 2008). The failure to measure the inventory level changes during promotions not only results in failure to determine which promotions have been successful but actually make unprofitable promotions appear to be profitable (Alwan, Liu and Yao, 2003).

Cho and Lee (2012) have identified three causes of the bullwhip: forecasting techniques, replenishment lead time and inventory policies, all of which they argue are controllable, especially the forecasting techniques. Figure 2.24 shows the variance in orders from retailers to manufacturers. It is clear that the variance increases as we move from retailers to manufacturers.
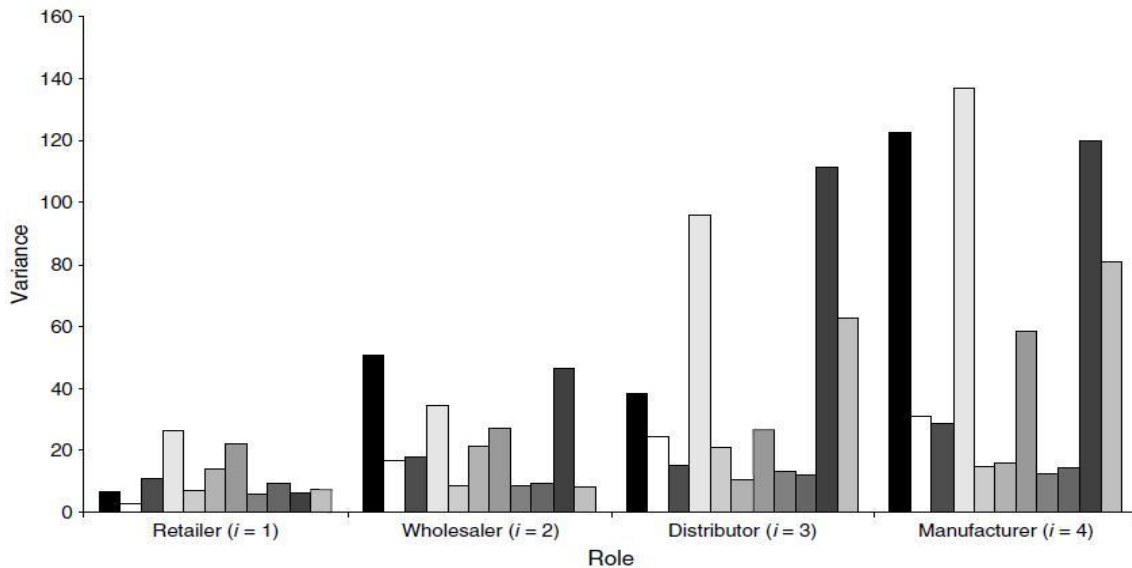


**Figure 2.24** Variance of order from retailer to manufacturer (Croson and Donohue, 2006)

After discussing the information distortion and resulting increase in stock levels, the next section will review the literature relating to the way in which demand is amplified during promotions and the implications for forecasting and inventory management.

Demand amplification is a problem which is usually faced by the manufacturers in the promotions period. In order to manage capacity planning, material requirement planning and production scheduling, the supplier performs product forecasting. It is usually based on the past customer order history. Any past product order will become a future demand signal. This signal processing of demand is a major factor in demand amplification for manufacturers (Luong and Phien, 2007). The retailer usually forward buys the product due to attractive price which results in price fluctuations. The supplier faces an erratic stream of consumer orders. In one month, there is a spike in demand whereas there is no demand in other months. This is shown in Figure 2.25. This has serious implications for manufacturers in terms of costs. They incur excess raw material costs, excess capacity costs, additional

transportation costs and additional warehousing costs (Duc et al., 2008).



**Figure 2.25** Demand amplification in promotional environment (Cachon and Fisher, 2000)

These problems can be mitigated if there is more supply chain coordination between supplier and buyers. Possible solution can be to share the real time disaggregated consumer demand at the store level among both supplier and buyers. This helps in reducing the production costs as only what is required at the store will be produced, inventory carrying costs as it helps in stock allocation during promotions and thus improving promotional performances both for retailers and suppliers. Anderson and Morrice (2000) showed that sharing customer order information greatly reduced the cost and capacity fluctuations. This was also supported by Croson and Donohue (2006) where they controlled demand-signal processing errors by sharing the distribution information to all the participants in the supply chain.

Having identified the fact that there is a mismatch between the demand and supply side (due to limited information sharing at different stages of promotions) which effects stock allocation and shelf replenishment significantly the next section will review studies concerned with promotional execution to see how this demand and supply mismatch effects promotional performance.

## 2.4 Execution of Promotions

The execution of promotions can be very painstaking work as it involves the co-ordination of

multiple components. Promotions tactics are the specialised tools to execute promotion strategy. The best way to identify a specific tactic is to generate and screen the alternatives. Croxton et al. (2002) studied important activities in successful implementation of synchronised demand and supply chain processes as shown in figure 2.26 below. They showed that a good execution requires balancing consumer requirements with a firm's capabilities. They identified that reduced demand variability helps in successful implementation of plans but that firms with increased flexibility can manage interruptions in operational plans more effectively. Smoother execution results in better asset utilization which leads to reduce costs.
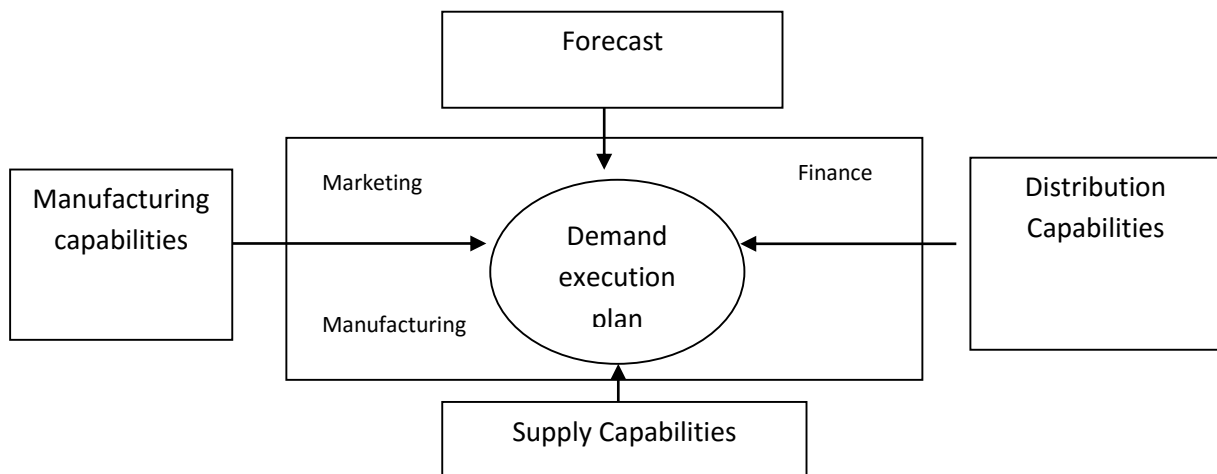


**Figure 2.26** Synchronized demand and supply chain execution plan (Croxton et al., 2002)

One of their important recommendations was that a better understanding of a firm's capacity will help in accurate planning especially in higher demand periods as it highlights key points along the supply chain where flexibility can be achieved. This understanding of capacity will also help in proactively addressing the operational issues before they cause significant problems.

Ciancimino and Cannella (2012) observed that benefits of supply chain collaboration are frequently emphasised in the supply chain literature but synchronisation of the supply chain is not adequately discussed. The key reasons identified by them are incomplete understanding of consumer data. They emphasised the need of understanding 'which' data

to share, '*how*' to share and '*when*' to share for supply chain coordination. Thorough understanding of data and its application will help in creating stability in inventories during volatile consumer demand. This will also help in reducing holding costs, re-ordering costs, lead time and smooth demand forecasting.

Jüttner et al. (2007) observed the level of integration between supply and demand activities and developed a matrix to see where the market winners are present as shown in figure 2.27 below.

| | LOW | Supply chain advantage | HIGH |
|---|---|---|---|
| Marketing advantage | **Market Losers** | | **Supply chain Specialists**<br><br>Problems:<br><br>- Ineffective delivery<br>- Lack of product differentiation |
| High | **Marketing specialists**<br><br>- Under delivery<br>- Excessive supply chain costs | | **Market Winners**<br><br>- Satisfying different customer needs with differential supply chain |

**Figure 2.27** levels of marketing and supply chain integration (Jüttner et al., 2007)

They argued that companies in markets that have diverse consumer needs have to adjust their supply chains to consumer demands in order to survive. This adjustment will result in better customer value supported by robust business systems. They advocate that the end user and not the business function should drive the supply chain as this will ensure the integration of marketing with logistics. They observed that the supply chain is still disconnected from the demand side and supply chain managers have no information about their companies' customer facing operations. This disconnects causes problems on both ends with demand side facing ineffective deliveries and supply side having sub optimal processes. They offered a solution by proposing that firms need to understand customer

expectations and develop responses through deployment of operational process which link supply and demand effectively.

Managing promotions has become a major concern both for retailers and suppliers due to high maintenance costs and lack of profitability (Ailawadi et al., 2009). No benchmark performance indicators are designed on which the success of promotions can be measured. The promotional offers are usually designed where impacts are considered uniform across all customer segments. This one size fits all approach is not supported empirically. Gauri, Sudhir and Talukdar (2008) show that, different profiles of customer have different shopping goals. These goals influence promotional response in their respective stores as well. The steeper the discount, the greater the fluctuations in consumer demand.

Pauler and Dick (2007) showed that the process of adjustment of marketing and production starts with identifying the market segments based on psychographics and demographics. The profitability of a segment is then measured according to sales value and volume. The identified segment will be then analysed and subsequent resources will be allocated (figure 2.28).
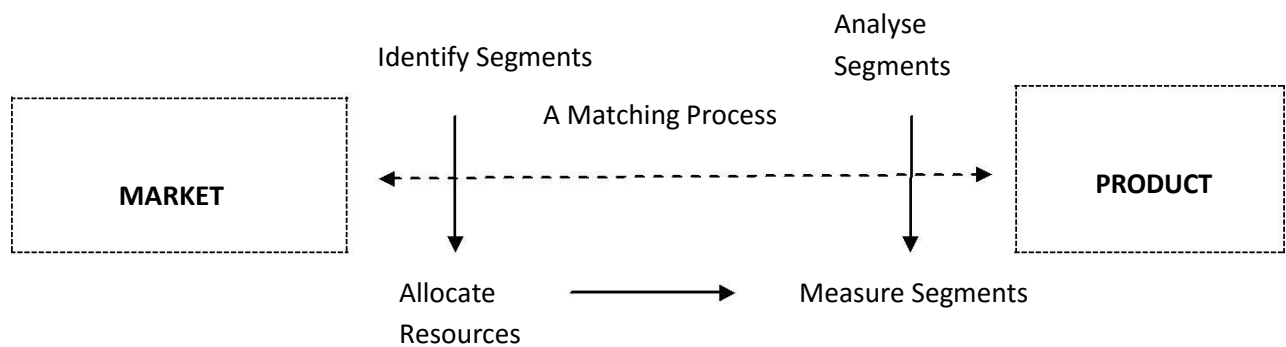


**Figure 2.28** Customer Segmentation Process (Pauler and Dick, 2007)

Zhang et al. (2007) showed that customer segmentation significantly impacts inventory management and distribution along the supply chain. They advocate the allocation of supply chain resources based on customer segmentation.

Without effective consumer information sharing between supply chain partners, the ability of a firm to respond to segmented consumer needs and gain competitive advantage is

reduced. It will also result in increased uncertainty and excess inventory. Collaborative consumer information exchange in forecasting, planning and replenishment phase has shown to decrease demand amplification (Cannella and Ciancimino, 2010).

The lack of accurate data on product availability is a major challenge in estimating the impact of retail demand. Different companies, such as M&S, are introducing new IT systems which will allocate product shelf space as per its sales (Grocer, 2012). But estimation errors are present in these systems. They treat product as available if it is present in the store not on the shelf. This give an imprecise picture but the shelf is often empty for the customer. DeHoratius and Raman (2008) observed large errors in actual and system recorded stock levels. Therefore, it requires careful audits on actual stock levels for an accurate picture of promotional execution to be gained.

Hanns and Gijsbrechts (2011) studied the depth of promotional discount across 103 outlets in four product categories for four supermarket chains. They noticed that promotional effectiveness varies across different sizes of stores with different levels of logistical support. Similarly, the institute of promotional marketing (2011) noted that £3 billion from £14.4 billion of sales promotion costs can be saved if promotions are properly planned and executed with the support of channel partners. Godsell et al. (2011) have observed that many promotions fail despite having exciting offers, superb design but a simple error in the administration system. These include errors in calculating redemption rates, supply chain support and generalisation of consumer behaviours for promotional response.

This review of promotional execution studies has shown that there are significant issues around forecasting accurate consumer demand, distribution of stock and replenishment of inventory during promotional period. These issues are of specific relevance to marketing and operations managers, neither of who appear to be are making full use of information sharing and tend to make decisions in isolation when executing promotions.

Promotion execution seems to be done without consideration of segmented consumer demand at the supply chain or depot level rather than the store level. This can have a

significant on the execution of promotions and their effectiveness for retailers and suppliers. Improving stock allocation and availability in store is a critical success factor, as the presence of the right amount of stock in the right stores will not only improve customer loyalty but it will make promotions more profitable.

## 2.5 Gaps identified in the Literature

The analysis of the interplay between demand and supply has received little attention. Specifically, the literature has highlighted the importance of the relationship between demand and supply side factors and the use of information in the context of promotional planning and execution. In the context of this research, promotional execution is defined as the combination of distribution management (from factory to distribution centre) and shelf replenishment. Moreover, where such studies have been undertaken the context is invariably one involving retailers and large branded manufacturers, the majority of which have formalised processes and resources available to deliver the kind of co-ordination and integration  that is required in order for promotions to be successful. Such systems are unlikely to be found within small food producers and those producing own-label products, which account for a significant share of the products sold by supermarkets. Thus, there is a gap in the literature relating to the management of promotions when the products involved are supplied by SMEs.

The majority of empirical studies found have used either scanner data, which is highly aggregated and therefore fails to capture the differential impacts between products and/or consumer segments, or survey data which relies on claimed/reported behaviour, which is highly unreliable. Thus, the second gap in the literature relates to the impact that the use of disaggregated sales data might have on the efficiency and effectiveness of price promotions.

Understanding the interaction of both demand and supply for SME's is critical for the accurate prediction of promotional impacts due to their limited resources, at the point of purchase as well as upstream – in the distribution system and the manufacturing process. Focusing on one without consideration of the other is likely to result in inaccurate diagnosis and prediction which can result in loss of market share for SME's who are already fighting for

survival against large firms in an extremely competitive business environment.

Not only has the literature review revealed these significant gaps; it has also highlighted the important role that information plays in the decision-making process and the adverse consequences of inadequate consumer insight and inadequate sharing of information along the supply chain especially. This is especially critical for SME's as information sharing during critical stages of promotional planning and execution will help them utilize their resources more effectively, resulting in improved promotional performance. Thus, in seeking to capture both demand and supply side factors in greater detail this research will focus specifically on the use of disaggregated sales data, by store and shopper segment in order to a) generate a more accurate and comprehensive picture of demand and b) identify critical areas on the supply side where the sharing of this data could result in improved promotional performance, especially for SME's.

Given the lack of research in this specific area, it was felt that some exploratory research, in the form of semi-structured expert interviews, should be conducted before proceeding to with any statistical modelling of the perceived problem. The next chapter reports the findings from this research, which will help lay the foundation for the simulation modelling that follows later in the thesis.

# CHAPTER 3- Expert Interviews

## 3.1 Introduction

Having identified significant gaps in the existing literature relating to the use of disaggregated sales data for sales forecasting and stock allocation, and the complete lack of research that relates specifically to the management of promotions involving SMEs, it was deemed appropriate to conduct some exploratory qualitative research before progressing with the simulation modelling. These interviews will inform and validate conceptual framework arising from literature review.

In order to address the issue of product characteristics, identified by several authors as an important factor that influences the impact of promotions on consumer behaviour and one that also has implications for supply chain management, two product sectors were chosen: one representing branded, ambient products – cold pressed rapeseed oil – and one representing fresh, own-label products – root vegetables, mushrooms and top fruit.

The relevant personnel (marketing and/or account managers) from a small number of suppliers from these categories were approached and agreed to be interviewed for the purpose of this research. All of the participants were known to the supervisory team through previous projects.

A semi-structured interview guide (see appendix A) was used, based on the key elements of the literature and focussed on the different stages of the promotional cycle. The primary purpose of the interviews was to establish the extent to which the approach to supermarket promotions, and in particular promotions with Tesco, adopted by these small-scale suppliers in these distinct product categories complied with the conceptual models and empirical evidence identified from the literature.

In the first stage, rapeseed oil was selected as representative of the ambient product category and two small suppliers (Hillfarm Oils and Border fields) were contacted. They are subsequently identified as company 'A' and 'B'. The people interviewed were account managers as they were responsible for marketing, account management with Tesco and the whole sales promotion process.

## 3.2 Case Study 1 (Ambient product category)

Rapeseed is a bright yellow flowering member of the Cabbage or mustard family. It is cultivated mainly for its oil-rich seed and is the third largest source of vegetable oil in the world. The UK produced 2.6 million tons of Rapeseed oil in 2012 (USDA, 2012). This product was selected to represent the ambient category as it has a long shelf life and relatively stable demand. The market share for rapeseed oil is growing compared to olive oil but customer penetration is low and many small rapeseed oil producers are competing fiercely for market share.

### 3.2.1 Company 'A'

Company 'A' are a family run business and they farm outside Halesworth in the surrounding Suffolk countryside with rapeseed as one of the main crops grown. They were created in March 2004, and produce Cold Pressed Extra Virgin Culinary Rapeseed Oil in 500ml bottles for most of the major supermarkets, including Tesco. The account manager has overall responsible for sales promotions. He is subsequently referred to as account manager 'A'.

### 3.2.2 Company 'B'

Company 'B' was established by a group of arable farmers in 2005. They supply two types of rapeseed oil in 500ml and 250ml bottles to most of the major multiples, including Tesco. The account manager has overall responsibility for sales promotion. She is subsequently referred to as account manager 'B'.

### 3.2.3 Promotional objectives

Both of these companies are main suppliers of Rapeseed oil to most of the main UK supermarkets, with company B claiming to be the market leader. Rapeseed oil is a relative new product in the cooking oil category and is used in salad dressing, cooking and frying. Both of these companies have used different types of promotions (price and non-price promotions). They claim to use promotions for both short and long term objectives:

*'We look both ways (short and long term) when thinking about sales promotions' (Account Manager A)*

*'...long term objective is to retain customers' (Account Manager B)*

The short term objective is only to increase volume, with both account managers highly focussed on increasing sales:

'I *need to sell, sell and sell. I am selling 150,000 litres a year. I have to get it 500,000 litres per year'(Account Manager A)*

Despite claiming to have both short and long term promotional objectives they failed to relate these to specific promotional mechanics:

'... not really, w*e are trying different promotions and seeing which one is working out or not' (Account Manager B)*

They identified the deep cut price promotion as the most effective way of increasing sales volume. However, the depth of the cut is determined by what they can afford rather than consumer demand:

*'...we retail at 3.99 and we have learnt that best mechanic is one pound off in retail. From financial point of view we don't want to go any further than that.'  (Account Manager B)*

Supermarket buyers have a very strong influence in the setting of promotional objectives. On many occasions the decision to promote is based on the (perceived) need to fill a gap in the supermarket's promotional calendar or when the opportunity arises:

*'Like Tesco has a clear corporate plan I see where the gaps and fill in with price promotions' (Account Manager A)*

*'... We will just fit them in whenever we get the chance to speak to buyer' (Account Manager B)*

Their experience with non- price promotions does not seems to increase their sales volume so they are less focused on non-price promotions. The only reasons they employ it is to

increase the trial of their product. This is evident from account manager 'B' statement

*'They look very quickly for what they need. So we need to be standing out on shelf. Word win will instantly get the attention'*

### 3.2.3.1 Impact Measures

They measure the success of their promotional campaigns by the change in sales volume. They recognise this is rather a crude measure but still both of them are using it. They talk about using promotions to increase market share and expand the category but these potential impacts are not formally reflected in the setting of promotional objectives:

*'...Change in sales before and after the promotions (3-4 weeks), its very crude but this is the main criteria' (Account Manager A)*

They tended to use historical sales and their personal experience/judgement when setting promotional objectives:

*'There is an element of we know it works, we have done it before. Gut feeling/ Experience of what happens in previous different stores' (Account Manager B)*

Overall, it would appear that little thought goes into the setting of promotional objectives or the design of promotional campaigns. The approach is largely opportunistic and often driven by the promotional calendar of the supermarket rather than specific objective, shot term or term, of the suppliers. Measurement of promotional goals is crude, focusing exclusively on short term volume sales, and goal setting is based primarily on history.

### 3.2.4 Promotional Planning

The planning horizon of the two companies varies from 1 to 2 years. They claim to plan promotions by keeping both the supply and demand side in mind:

*'It's the whole thing that comes into play (supply side, production and demand side). We will only run a promotion we think we can afford to run' (Account Manager B)*

Being dedicated suppliers of supermarket they claim to have robust supply chain systems in place to manage promotions. They were more concerned with the uncertainty of consumer demand when planning the promotions than their ability to supply. They view demand fluctuations as the greatest risk factor in their promotional planning:

*'The production capacity is enormous as compared to our ability to sell. Historically production, packaging or distribution has not caused us any issue. We know we have got systems in place. We are sure that it will not go wrong' (Account Manager B)*

Both of them made errors in estimating consumer demand in the promotional planning phase due to inaccurate demand forecasting:

*'It is because the forecasting is not right. I suspect it's down to me especially when I am done to write it on form' (Account Manager A)*

With an annual crop cycle, crop planting is planned one year in advance to cater for the increased sales resulting from promotional campaigns. The nature of the product helps in this regard, as it can be stored for several months.

*'The life cycle of the oil is as such that you are never going to get to that point where it's a promotional waste' (Account Manager A)*

The two companies have slightly different process for planning sales promotions but in both cases promotional objectives are set solely by the account managers without input from any other employees:

*'Only I do that as we are a very small company' (Account Manager A)*

*'Me and only me' (Account Manager B)*

The small size of the business was the main reason given for this isolated approach to setting promotional objectives.

Company 'A' seems more integrated and organized during promotional planning as they gather all internal stakeholders in a meeting at the start of the year:

*'It's a very integrated process. It can't work if anything is in isolation' (Account Manager A)*

The meetings include the operations manager, production manager, quality control and account manager. Their main concern in the planning phase was stock management, which they viewed as a communication problem with the buyer.

The approach by company 'B' appeared less integrated:

*'No, we don't sit down but we do speak. It's not like that now we have promotional planning meeting' (Account Manager B)*

### 3.2.4.1 Use of Information

Their main information source is historical sales, in aggregate. They claim to know their target customers but give no explicit consideration to these target segments (their size, status, preferences etc) during the planning phase. Surprisingly, both have different target customers, despite producing products that are direct substitutes. For company 'A' it is 45-65 year old affluent people and for company 'B' it is 35-45 years old females. Despite claiming to know their target customers they fail to differentiate their promotions to the specific needs of these market segments.

This lack of consumer behaviour insight is giving them an inaccurate picture of consumer

demand during sales promotions. They have access to disaggregated consumer data (Tesco Loyalty card data), free of charge (through a special arrangement with Kent Business School) but don't have the time or the resources to use it:

*'Maybe we don't do enough of that. We have got the data but it needs another life to study it' (Account Manager B)*

This lack of application is partly due to their lack of marketing expertise and partly their failure to recognise the benefits of gaining a deeper understanding of their customers and the way they behave. Account manager 'A' was seen more willing to experiment with data than account manager 'B' (who claimed to be the market leader).

The lack of consumer insight leaves them exposed to unexpected events, particularly with respect to demand. This reactive approach to managing promotions is far from ideal and far removed from the idealised models reported in the literature:

*'Yes, it is sometime reactive. Not proactive. But we try to manage it' (Account Manager B)*

### 3.2.5 Promotional Execution

Company 'A' works with a consolidator to supply stock to the supermarkets. Due to the timing and space constrains with consolidators they sometimes face difficulties during periods of unexpected demand:

*'We use consolidator to do our distribution. Normally our orders are one or 2 pallets. (During promotions) it can increase from 6 to 8  so there was time and space limitations'(Account Manager A)*

Company 'B' has its own transportation, due to its major activity in the fresh produce sector. They claim to manage the demand surges associated with promotions without any problems:

*'Within the business we have the capacity to ship the oil directly to the depot so no problem with that'*

### 3.2.5.1  What are the main problem areas?

Despite having adequate capacity both account managers accepted that they often find themselves reacting to changes in consumer demand during the execution phase. These changes often catch them unaware. This reactive approach can cause problems, as in order to meet increased demand from one supermarket demand other orders are delayed and additional labour is called on site to meet the demand:

*'We got more people in to help us but the limiting factor on production is the speed which we can press the oil. We are pressing 24 hr a day. It was not much we can do about it' (Account Manager A)*

Most of the problems arise from variable consumer demand side the need for the supply side to react to unforeseen changes. This could be alleviated if the forecasting was based on more accurate information:

*'... It's not close but we manage. We speak on the phone '*

The influence of the retailer is evident in the execution phase. Both of them saw the benefit in taking responsibility for managing stock levels in the stores as the retailers struggle with this critical part of the process:

*'I would do it if I have time and resource. Even if I ask them they can't do that'(Account Manager A)*

*'We can't do it. They won't allow us to do it'*

Another important factor was communication with the buyers. Both of them complained that due to their relative small share in retailer's sales, which is around 1%, communication with them is not ideal:

*'They tend to sit there not listening. The collaboration with the retailers and suppliers are not that ideal' (Account Manager A)*

*'You should come to our sales meeting with retailers. You haven't said that after that...'(Account Manager B)*

They appear to be so focused on filling the gaps in the retailers' promotional calendar that they end up running three promotions in parallel sometimes of the year. This approach was justified as a mechanism for gaining market share:

*'...there is a bit of land grab going on. We want to get the market share. We don't want to do it at a loss but we want to be aggressive' (Account Manager B)*

This aggressive approach to sales promotions with inadequate consideration of consumer demand is unsustainable. Neither account managers gave enough consideration to consumer demand during the execution phase, exposing them to risks associated with stock outs and promotional waste.

### 3.2.6 Evaluation & Feedback

This is the fourth and final stage of the promotional cycle where the expected outcomes are matched with the actual outputs and change is fed back into the promotional objective and planning phase.

Both the account managers were responsible for the evaluation of promotional campaigns, again in isolation:

*'Only I am involved in this process' (Account Manager A)*

*'It is supposed to be me'* (Account Manager B)

Despite (or because of) their small size neither of these firms sit down and evaluate the performance of their sales promotions. Moreover, there is very little formal evaluation of sales promotions:

*'I don't put up here to say such promotions do such and such outcome. I should do' (Account Manager A)*

*'No we don't do that; we are not very good at that. It's an area where we know we need to do more' (Account Manager B)*

They blame a lack of time and resources.

*'I think it's because of time' (*Account manager A)

*'A bit of both, we know it works and we can see it works' (Account Manager B)*

The partial explanation of this attitude is that they attach less importance to evaluation and want to focus only on doing new promotions. They both realize the importance of formal evaluation and feedback for their business and profits. However, this acceptance of the value of evaluation is not reflected in their action. They had access to all types of tools both in terms of previous product sales history and segregated consumer demand to conduct the evaluation, yet they were running same promotions for next promotional cycle based purely

on the most recent change in sales volume. This overly simple view of the promotional cycle keeps them ignoring the complex interplay of demand and supply side factors affecting it.

### 3.2.7. Summary

Observation from these two interviews support the gaps identified in the literature. Both the account managers are overly focused on satisfying the retailers' objectives. They acknowledge the fact that different consumer segments have different needs and sales promotions should be designed around them. However, despite this acknowledgment they are running the promotional cycle without consideration of disaggregated consumer demand and consequently face problems in managing them.

They are confident of their supply chain to deliver even in uneven consumer demand but this confidence stops them from taking additional costs like extra labour, storage and enhanced production capacity into account. This lack of insight was obvious in both their planning and execution phase. They are also not able to link different promotional mechanic with different promotional objectives. This error in the first stage of promotional cycle is amplified in the end when desired promotional outcome is not achieved and a similar promotion is again fed into the next promotional cycle without formal evaluation.

As both the account managers were neither marketing experts nor supply chain professionals they cannot appreciate the advantage of targeted marketing and a more responsive supply chain. The findings from these two interviews support the need to use disaggregated consumer demand data with specific promotional mechanics to plan promotions more effectively.

## 3.3 Case study 2 (Fresh produce category)

### 3.3.1 Introduction

The word 'Produce' is generally used for a group of farm-produced crops & goods, including (but not limited to) vegetables and fruits (i.e. oats, grains, meats etc. are sometimes considered as produce). Specifically, the term "produce" usually implies that the products are fresh and in the same state as where they were harvested (Martin, 1857). For this

research mushrooms, carrots and apples were selected to represent the fresh produce category.

These products have shorter shelf life and greater perishability as compared to the ambient category products and their demand and supply can be seasonal and is often influenced by the weather. These distinct differences present particular challenges for fresh producers when planning promotions. Fresh produce supply chains have to be responsive to manage uneven fluctuations in demand and supply during sales promotions. The account managers of four fresh produce companies representing three products (apples, mushrooms, and carrots) were selected to explore the practical process of sales promotions for fresh produce, from the setting of promotional objectives to evaluation and feedback.

### 3.3.1 Company 'C' (Apple supplier)

The account manager of two apple supplying companies (AC Goatham and Son & Norman Collett Ltd) was interviewed for this research. She will be referred as account manager C. The first company (AC Goatham and Son) is a family run company founded in 1947. It is currently farming apples on 1,650 acres of land. They supply apples to three major UK supermarkets (Sainsbury, Morrisons and Asda).

The second firm (Norman Collett Ltd) is based in Paddock Wood, Kent, operating out of the Transfesa estate alongside much of the produce industry of the South East. They employ around 40 staff who cares for growers and their orchards, manage their relationship with retail partners and work on a 3,500 sq. ft grade 'A' BRC accredited consolidation centre which handles more than three million cartons per year.

### 3.3.2 Company 'D' (Mushroom Supplier)

The second account manager was from a mushroom supplying firm (Fiddleford) and will be referred as account manager D in this research. This firm is located in South-West of England in the heart of the Blackmore Vale. Established in 1988, it is one of Britain's leading growers of fresh, high quality mushrooms. Mushrooms are harvested at different stages of maturity in order to create a wide product range suitable for retailers, caterers and home

cooking. Mushroom growing itself is a virtuous cycle whereby waste products from the agricultural industry are combined to produce mushroom compost, which after growing a crop of healthy food, is then incorporated back into the land. The farm is also able to develop product ranges, packaging and labelling to suit individual needs.

### 3.3.3 Company 'E' (Carrot supplier)

The account manager of Carrot supplier (Huntapac) was interviewed and will be referred as account manager E in this research. Huntapac Produce Ltd is a third generation family-owned business which was established in 1942. Nestled in a small village in the heart of Lancashire, they specialise in growing, packing and distributing a variety of root vegetables, brassicas and salads. Originally, Huntapac supplied the local Fruit & Vegetables markets in Lancashire and Yorkshire. However in 1967 a new pack house was built to cope with the increasing demand for high quality produce on approx. 1'950 acres.

### 3.3.4 Promotional objectives

The majority of the own label fresh produce suppliers interviewed acknowledge the fact that no formal promotional objectives are either set or linked with any specific promotional mechanic with the notable exception of apple supplier C

*'Yes, for example to start driving the sales at the start of the season then you have deep cut promotional mechanic' (Account Manager C)*

*'No it's not written down, it's not that formal as it's an own label so we don't link any formal promotional objectives with mechanics. 'It should be, but it tends not to be.... It's on gut feel'' (Account Manager D)*

This shows that the promotional cycle starts with no set promotional objectives. The only objective for fresh produce suppliers is to generate sales volume at the start of the season. This lack of detail in setting of promotional objective can be explained by different factors. In

carrots retailers influence the suppliers to run a promotion in a very short span of time (two weeks).

*'We get a phone call or an email not more than 2 weeks before the promotions starts'* *(Account Manager D)*

This leaves them with no choice but to follow. The reaction time for mushrooms is a bit more (eight weeks) but not enough to plan.

*'It's the amount of time. We need at least 8 weeks' notice to run a promotion'* *(Account Manager E)*

All the suppliers have a similar short term promotional aim to increase the sales volume.

*'Driving awareness hopefully to increase the sales and driving the volume as you pick up the health plan*.' (Account Manager C)

*'Key bit for us most of the times are the increase in volume'* *(Account Manager E)*

*'It means really the way of driving more volume for our customer and our business as well'* *(Account Manager D)*

The focus on increasing sales volume means they pay little attention to the cost of increasing supply. Also, they claim to have long term objective in their mind while setting the promotional objectives but fail to relate this in terms of their promotional objectives. Their long term promotional objectives differ slightly depending on the appeal of the product, but their common long term goal is to increase the customer base and expand the category.

*'Long term is we trying to get customer to buy more mushroom'* *(Account Manager E)*

*'Then you have long term objective that is to build loyalty and encouraging people to do repeat purchase' (Account Manager C)*

*'It means trying to bring more customers into the category and also as a way of helping our main customer Tesco' (Account Manager E)*

Their current practice of looking into the sales promotion only to increase sales volume is not linked to their stated long term objectives. All of all them are experiencing post promotion dips after the sales promotions which contradict their stated position. Sales promotions are not helping them increase their customer base or category expansion. They expected to achieve their long term promotional objectives but lack expertise, resources or time to achieve that goal.

### 3.3.4.1  Impact Measures

Suppliers state that they measure the success of the sales promotion by customer engagement, return on investment, profit margin and overall category expansion.

*'It's about engagement with the people. It's a very different way. It's not only about aware of buying the apple but to be rewarded to buy an apple' (Account Manager E)*

*'It's about growing category as it's a regular product' (Account Manager D)*

*'Keeping customer happy, they look at market share but the absolute measurement is about profit margins, returns on that promotion..... Am I selling more to more customers? It's about sales volume but it's also about bringing new people to the category' (Account Manager D)*

Despite stating specific measures, sales of all these products are constantly going down meaning they are not able to achieve their stated promotional objectives of category expansion, profits or customer engagement. Share of the apples in fruit category is reduced from first to third:

*'Apple was the most commonly eaten fruit, now they are behind bananas and berries. There is awful lot of drive behind the sales plan now is to increase the volume of apples eaten to retake that lost market share' (Account Manager C)*

Sales of carrots are also towards the downward and retailers are struggling to maintain demand levels

*'Therefore challenge for the Tesco or Waitrose is to get people buys people their carrots' (Account Manager D)*

After noting their promotional success measures they were asked about the involvement of different stakeholders in setting the promotional objectives. It seems retailers were heavily involved in their decision making as shown in the next section.

### 3.3.4.2  Who is involved in the setting of objectives?

Retailers are working closely with the fresh produce suppliers in setting of promotional objectives. This is more significant in own label and this involvement has become a necessity for suppliers. They have to follow the corporate plan of the retailers. This involvement is more of a compulsion then a mutual exercise. This shows the impact of retailers buying power in fresh produce category.

*'If Tesco wants to run promotions they will tell us to contribute, so we have to do it.' (Account Manager D)*

*'What might buyer want to do or likes, or their boss is telling them to do or what the corporate theme is at the time' (Account Manager E)*

This retailers focused promotions are pushing suppliers in a tight corner where they are more concern about keeping their business then satisfying the consumer demand.

Supermarkets are their major customers and they are producing their products in bulk where they expect to save due to economics of scale. But due to retailers induce promotions they have to operate on a very tight profit margin.

*'Yes, its 10 percent. You manage that at a later period' (Account Manager C)*

*'Its 5%, we see our overheads and decide keeping in view that level of margin' (Account Manager D)*

*'Yes, its 10 percent. You manage that at a later period zero or less than zero' (Account Manager E)*

Retailers are heavily involved in setting these promotional objectives. Levels of retailers' involvement in each firm vary slightly depending on the appeal of the product and frequency of the promotions.

*'Only Commercial manager is involved from our side' (Account Manager C)*

*'It's a mixture. 50 percent me and other fifty (production manager+ Tesco procurement)' (Account Manager D)*

In the case of carrots, internal marketing team of the Tesco will only inform suppliers two weeks prior to the promotions so there is no-one else involved in it. These big shifts in relationships are making promotions lose focus of the target customer and thus making it unsustainable. After setting the promotional objectives suppliers then have to make a detail plan to achieve those objectives. Despite having different business dynamics fresh produce are planning promotions on the same line as ambient category suppliers as shown below.

### 3.3.5 Promotional Planning

Sales promotional planning has to be in line with the promotional objectives set in the first stage of promotional cycle. This planning has to be done keeping in view both demand and

supply side. But fresh produce suppliers are confident about the supply side process and consider them robust enough to support them in any promotional demand fluctuations. Some of the suppliers are even running far below their capacity to manage these uneven loads.

*'For additional volumes with capacity spare, we run with probably with 50 percent spare. It sounds ridiculous.'(Account Manager D)*

*'Your grower will tell you how much product they have got. Before you harvest you know roughly what amount or volume of the apples that will be available for the season.' (Account Manager C )*

*'In our planning we hope to have enough stock and try to cover the fluctuations with the help of extra supplier.' (Account Manager E)*

Weather plays a significant part in promotional planning of fresh produce as compare to ambient category of products. All the account managers were of the view that unpredictability of the weather is their biggest concern in the promotional planning phase.

*'You cannot manage at all. We have a huge problem this year because we have a very late harvest in the summer period. The weather has a great deal of effect on the profitability.' (Account Manager C)*

*'But the biggest problem was us is the weather, as this changes the demand level. It's fluctuating'.(Account Manager D)*

*'The other thing with the produce is that because of seasonality and weather effects'.(Account Manger E)*

One of the interesting things came up during the interview was the political dimension of running a promotions. Fresh produce suppliers' view sales promotion as a way of impressing retailers that they are doing something to support their corporate aims.

*'It's very difficult price promotions is engaging with the customer but there is a political side to this. By engaging in media led variety and engaging in the research consumer data. You gain the attention of the team within the retailer' (Account Manager C)*

*'One of the reasons of running a promotion is to tell the retailers that we are doing something for the sake of something. There is also a corporate strategy which says we should be doing some of this. Because, that's what we want to do, and we can make a big story out of that.' (Account Manager D)*

*'So Tesco force us into it by saying we will give you the part of the volume to them if you don't promote' (Account Manager E)*

After discussing the reasons for doing the sales promotions, suppliers were asked about the set of information used in promotional planning. Their answers were similar to the suppliers of the ambient category of products as disused in next section.

### 3.3.5.1   What information is used to inform the planning process for each of these functional   areas?

Previous sales history forms the major part of the promotional planning process. All the suppliers claim to observe how their promotion worked in the previous year and planed next year promotion based on the previous year performance.

*'You have your historical data, sales figure from the previous season. You have the data from grower where they will tell you when they are ready to take the access crop. You know from the previous performance what volume you will have from marketable policy' (Account Manager C)*

*'We go to previous sales history of product both in terms of sales volume and value (Account Manager D )*

*'So you try to look what they did last year. So it's the sales history and we also use very short term forecast.' (Account Manager E)*

They claim to consider host of other factors included with the sales history. That includes the expected weather, time of the year, own managerial judgment and expected crop output. This was evident from their statements like account managers C states

*'You have the figure where you have the actual volume that will be harvested and then the expected volume that will make crop one, the format in which the product is being sold.'*

Similarly from account manager D statement

*'It also depends on the time of the year. For example in summer the volume is lower so we have to run a promotion to push the volumes up at the same times we have to put overhead it over as well.'*

Also, account manager E statement

*'So plan more than the absolute minimum to maintain the sequel fluctuations but you know a particular retailer will promote at particular time'*

All of them claim to use previous aggregate sale history of product but fail to associate that with the disaggregated consumer demand. Basing promotional planning on these set of information will give them inaccurate picture of sales promotion. They are measuring performance purely on increase in sales volume but fail to link promotion appeal with specific customer need. This aggregated view of promotion planning is hindering them from

considering the sales promotion in detail.  Next section will consider what essential planning variables are considered by supplier in promotional planning phase.

### 3.3.5.2 What are the key variables on which planning are focussed?

Fresh produce is a time sensitive category where production to delivery is linked with time. This becomes more critical in promotions period where demand levels are high and supply chain has to be responsive to support it. Due to technological advancements in the field of agriculture and supply chain the suppliers are able to supply their product all year round. For apples, cold storage is managed to distribute only the required quantity to the stores. Similarly, mushroom production is done in a controlled manner so that eight weeks cycle is managed in an optimal manner. Carrots are grown in the field in such a manner where only the required quantity is allowed the right environment to grow. These advancements have given suppliers enough space to manage their demand level in promotions. But this has caused them to lose focus from promotional waste. They claim to have very low level of waste. This was evident from account manager E statement

*'It's between 1-2 percent. From our point of view there is no promotional waste'*

Similarly, from account manager C statement

*'We are hopefully looking at a waste of less than 3 percent'*

Also, from the account manager D statement

*'It can't be more than 5%'*

Partial explanation to this phenomenon is that they have secondary market to dispose of their less profitable product. This is evident from account manager C statement

*'Yes, we have discount lines like you have got basic. Other goes in fruit servicing whole sales processing, for juice for prime mixes'*

Similarly from account manager E statement

*'So the best quality goes into the standard bag then for Tesco they have every day value for a lower quality. We also have customer who will take range of quality'*

Also from account manager D statement

*'We have very less waste. We have 4 sites and we avoid these situations by playing with the production of these sites'*

This mental definition is stopping them to exploit the full potential in promotional planning phase of their promotional cycle. But surprisingly all of them have a large range of inaccurate forecast. Due to this error in demand forecasting, more promotional waste was expected from the stated position. Forecasting errors were observed by all of them as evident from account manager E statement

*'Historically the retailers forecasting is reasonably inaccurate. It's in the range of 50-100%.'*

Also from account manager D statement

*'The weakest bit for us is the forecast ...It varies between 50-100%'*

Weather plays an important part in this process. Although suppliers are able to minimize the impact of weather on their supply chain but they are not able to manage the consumer demand impacted by the weather. Their product demand has a strong link with the weather. Some of them have winter appeal for customer whereas others are more used in the summer. Their concern about weather impact on consumer demand was evident from their statements like that of account manager C

*'So if you have a week of real horrible cold weather so people stop eating strawberries. So there is an issue what will goanna happen and where that product will go. The weather has a great deal of effect on the profitability. '*

Similarly, from account manager E statement

*'So look into another way fresh produce is a very mature category and also it's very susceptible to weather so hot cold wet sunshine'*

Despite having such large variation in forecasting, time criticality of the fresh produce along with the unpredictability of weather on the consumer demand suppliers manage to keep the promotional waste down. They have identified different secondary market to channel their waste. But none of them have linked their planning phase with the targeted consumer information. They have access to detailed consumer information by demographics and life style but have not been able to use it in their promotional planning phase. This gap in information use is evident in promotional execution where different minor and major problems are faced by the suppliers. Next section will report about the process of promotional execution of fresh produce suppliers.

### 3.3.6 Promotional execution

This is the stage in promotional cycle where promotions are actually executed. It is linked to both supply and demand side. There are certain deviations from planning during the actual process of sales promotions. There are different minor and major factors impacting this process. Type of fluctuations also depends on product category and its associated supply chain. Dynamics of consumer demand and operational side of supply side is more visible in promotional execution. Most of the fresh produce products are pick to order expect apples. This makes them less reliant on storage facilities whereas, for apples significant consideration for cold storage is included in promotional execution as evident from account manager C statement

*'In produce you have a crop which has a short shelf life. Once you open the store you have to clear them'*

This is different for carrot and mushrooms which are picking to order and no storage is needed as evident from account manager D statement

*'And I am less concern about the stock management as it's a shorter lead time pick to order product'*

Similarly from account manager E statement

*'Carrots you cannot do that, we store them on ground and open up field when we need them ....Because we are harvesting what we need and packing what we need'*

This dynamics of production cycle makes time management very critical for small suppliers. They only process specific product quantity as required by retailer in promotional period. Despite having flexibility in production cycle they encounter different challenges during promotional execution as discussed in next section.

### 3.3.6.1 What are the main areas in which problems occur and why?

All of them are experiencing different types of challenges in demand and supply side during the promotional execution. These problem areas are generally around managing production and packaging levels from supply side and impacts of consumer demand on order sizes. They have to manage these variations with their available resources and try to communicate that to the retailers as well. This is evident from account manager C statement

*'What volumes you sold through within the period, next come the technical information do you have adequate stocks avail of suitable quality; you make sure you are communicating it... They need to be aware and they should manage the storage, their packaging facilities. So you have your published programme and communication with the buyers. What you have available and at what price. There is reasonable amount of fluidity in the supply'*

Own a label supplier seems to have less control during promotional execution and they link their promotional volume sold with the weather. This strongly impacts their supply side. This was evident from account manager D statement

*'We have very less control over the implementation process so it's not easy to highlight one as Tesco is practically managing that end. We do certain things and then they change it last minute But the biggest problem was us is the weather, as this changes the demand level. It's fluctuating. The supply side issues can be that the size of the mushroom is not right as the mushrooms have to be of certain size to be picked up. If that are of not right size we may have to delay our orders.'*

They have to manage their stock levels and resources keeping in view with the demand patterns and retailers objectives during sales promotions. This was evident from account manager E statement

*'And the real challenge is to convince the retailers to listen as what we are saying ... It's the case of holding on and recalling enough loads from the fields make sure you have ensure the packaging is going on putting the product. Keeping the staff working longer making sure you have got enough packaging'*

All of them seem to be in reactive mode due to unknown consumer demand and retailers influence during the execution stage. They have to react to the changes in consumer demand pattern during the course of promotional cycle. This impact can be reduced by better pro-active planning in the second phase. If they would have observed the consumer demand at disaggregated level and link it with the production and stock levels then they were better placed to manage these demand levels.

### 3.3.3.6.2 How often does the implementation follow the plan, at different stages in the promotion cycle?

Despite acknowledging the fact that they are in reactive mode in managing the consumer demand they seem comfortable with the accuracy of promotional plan during the promotional execution stage. This is evident from account manager D statement

*'We are fairly accurate on our execution. We deliver on time, have a healthy volume boost and work with the depot to achieve our promotional objectives. Occasionally things go wrong on some day but we cover it the next day. It's minor.'*

Some of them acknowledge that they may not be managing the demand levels during promotional execution but have reliable suppliers base to cover that fluctuation. This was evident from account manager C statement

*'If you have issue with the suppliers, suppliers work and help each other to ensure the retailers are not disappointed. If they have challenge meeting the demand of the retailers then suppliers will generally manage within themselves'*

They also accept the fact that additional resources are employed to meet the demand levels. These additional resources come at a cost and have implications for suppliers' profit margins. This was evident from account manager E statement

*'There is a limit for machine to pack. For additional volumes we get more machines. For additional volumes with capacity spare, we run with probably with 50 percent spare... you bring in additional kits bits and bolts. Do you whatever you can to give you additional capacities'*

There are clear indications that not all things are going as per promotional plan. There are certain issues against predicting accurate demand levels, associated supply side problems of production and resources. These additional resource constrains can become a significant inhibitor for small suppliers in promotional cycle. They clearly need better understanding of consumer demand and its linkage to their supply chain. This integration of relevant consumer information on both demand and supply side will help them manage their promotional cycle with available resources. Currently they are engaged in continuous cycle of promoting their product on retailers will without formally evaluating their promotional performance. This is discussed in next section of promotional evaluation and feedback.

### 3.3.7 Promotional evaluation & Feedback

This is the stage where promotional performance is formally evaluated and any variations are incorporated in next promotional cycle for better outcome. Majority of suppliers except account manager of apples accept that they do little or no formal evaluation of promotional performance. This was evident from account manager D statement

*'No, it's not formal. We see the overall volumes. We see if there is an increase, and based on that we judge it and its link to the overall profitability'*

Account manager E was more open to the real process of promotional evaluation. He acknowledges that very less evaluation is done and reasons for a particular promotional performance is not observed properly. This was evident from his statement

*'Only on an ad-hoc basis, the retailers will say look this promotion has worked. We will have a look and say ok. We have tried to do promotional evaluation but it comes back. The sophistication with which were doing is not good... yes promotion has worked but we don't know why and how '*

This was in contrast to the account manager C statement

*'There is weekly evaluation and monthly evaluation and seasonal one as well. Constantly evaluating the position and volume sold at the previous year. How stocks are being managed. Whether there is an emerging sort of pattern on the variety. So there is constant evaluation which mechanics work'*

Despite claiming to done formal promotional evaluation she cannot identify her target customers. This was evident from her response when asked about her target customer she stated

'Weekly shoppers'

Only evaluation criterion that seems to be discussed by account manager C was the change in promotional volume. This overly simple measure is misleading. Change in volume can occur due to variety of reasons i.e. repeat purchase, cannibalization effect, opportunistic

customers. She also acknowledges some of different factors influencing consumer demand levels. This was evident from her statement

*'There will always be a proportional of shoppers who will only shop while on promotion cycle you have to be pragmatic and have to accept that'*

After probing about the formulation of promotional evaluation, respondents were asked about the involvement of different stakeholders in the formal promotional evaluation process. Different levels of involvement with multiple implications were found as discussed in the next section.

### 3.3.7.1   Who is involved in the evaluation process and who receives any feedback generated?

Despite acknowledging the fact that they do very little formal evaluation they claim to have different people in the chain to do promotional evaluation. This was evident from account manager D statement

*'Its 50 percent me and other, 50 percent procurement, production and technical, they sit in the head offices, two of them. They coordinate it with others.'*

Whereas, account manager C claim to have elaborated evaluation team as evident from her statement

*'Buyer and technical manager, retailer and marketing manager'*

They seem to have a fair presentation of all the concern stakeholders in their promotional evaluation but similar promotional cycles are repeated over time. This means either these stakeholders are not using required information for evaluation or they are not feeding effective evaluation in the next promotional cycle. This apparent gap in theory and practice is making promotional cycle less sustainable and lesser profitable over course of time. Partial reason for this gap was suggested by the account manager E as evident from his statement

*'Farming focus retailers haven't driven produce in this way up until now because they have not got the head around... Produce suppliers are farming experts they are not marketing or supply chain experts'*

Previously they were focused more on the farming side of the promotional cycle and have less orientation about right disaggregated consumer information and its impact on supply chain. After persistent decline in sales even with the application of sales promotions they are gradually focusing their attention to consumer demand and its associated supply chain. But this change of attitude about sales promotions in fresh produce is heavily dependent on account managers' personalities. Significant level of doubts exits in their mind about the usefulness of this information for their business benefit.

*'Produce is behind all the other areas. Its very farming, unsophisticated focused... There is lots of cynicism about consumer data within the produce. You spend a huge amount and what we get is one percent uplift in volumes. ROI has not been very good'*

Partial explanation to this attitude is that they don't have the expertise, time or resources due to their size to use this information for their business benefit. But the trend is now changing and they are realising the benefit of using targeted consumer information and its

application in managing the supply chain and managing consumer demand levels. They have started to work more closely to feed outcomes from formal evaluation to next promotional cycle to make their promotions more sustainable and profitable.

### 3.3.8 Summary

The nature of the product has a direct effect on the dynamics of doing business in the FMCG sector. Fresh produce has a short shelf life and high perishability as the lead time from production to the end user is much shorter. This is very different from ambient product category where a product has significant large shelf life and low perishability. This makes every process in the fresh produce business time critical. This time criticality plays an important role in promotional cycle. From setting of promotional objectives to evaluating the promotional performance, every stage has to be linked with certain timeline.

These time sensitive processes increases the chances of error at every stage, which can result into high promotional waste. But surprisingly this was not supported by the account managers' view on promotional waste. They only consider product as 'promotional waste' when either it's thrown away or carry no significant business interests. This shows the account managers have different views of defining promotional waste. They can dispose of their product in secondary markets if it fails to sell it in supermarkets. This view of promotional waste is stopping account managers from exploiting the full potential of their core business processes. They can improve current promotional practices and consequently reduce waste by using right type of information at appropriate stage of promotional cycle i.e. segmented consumer demand information in promotional objective and planning phase.

They have not been able to identify their targeted customer and consequently failed to design promotions around it. They blame this lack of focus to the high customer penetration of product and farming orientation in the past. This gap in the use of disaggregated consumer demand information and its intended use in promotional cycle can potentially reduce promotional effectiveness and increases promotional waste.

Own label suppliers are significantly seen more under the influence of retailers as compared to their branded counterparts. Retailers dictate their terms of business to an extent that a representative of them is involved in the every planning process as well. This is also true in promotional cycle and this relationship is heavily skewed towards the retailers due to their buying power. This asymmetry is more pronounced in small suppliers who are forced to perform different types of promotions on the whim of retailers. Mostly they oblige, but sometimes they are unable to do it due to resource constrains. This lack of collaboration from retailers end is sometimes forcing suppliers to engage in a promotional cycle which is not sustainable. They fear loss of business volume from them if they don't oblige and consequently, engage in promotional activity on tight profit margins.

Despite having different business dynamics small suppliers are surprisingly doing the sales promotions in similar fashion to that of ambient category suppliers. In the price promotions they focus more on price discounting as compare to bundle promotions. They don't link objectives with specific promotional mechanic in both promotional objective and planning stages. They don't use targeted customer demand information in the promotional cycle. Sometimes they lack will and most of the time technical expertise and time to design their promotional cycle around target customer. They are not significantly engaged in promotional evaluation and feedback. This causes similar promotions to run every year without perception of its actual value expect increase in sales volume.

This apparent lack of detail in promotional cycle can be partially blamed to the level of expertise and consumer knowledge of account managers. They are experience company employees who have been promoted from within the company without the formal knowledge of marketing and supply chain management. They tend to attach less importance to targeted marketing efforts and responsive supply chain during promotional cycle. They seem satisfied with the only fact that their sales volume grows for a shorter promotional period despite being offset again after promotions. This overly simple view of promotions is causing neglect by account managers to a clearly complex demand and supply process. This is causing increase in number of price promotions which are unsustainable and carry less value for both target customer and retailers.

Sales promotions is a complex interplay of demand and supply side factors which requires detail understanding of customer and its associated processes. Over emphasis on increase in sales volume without taking into account all other associated process may cause unprofitable sales promotions appears profitable. Suppliers seem partially justified to focus on increasing sales volume as price is already dictated by retailers. This leaves very less room for suppliers to make their promotions more profitable. But targeting right customer and designing effective supply chain around it will reduce their total cost and consequently increase profitability.

## 3.4 Cross case comparison

This section will compare and discuss promotional cycle of both case studies, its relevance from literature and validity of proposed research framework. Two distinct types of product categories (ambient and fresh produce) were selected for this research. These categories were selected based on differences in doing businesses, nature of these products, volatility in consumer demand and impact of weather variation on their supply and demand. These differences significantly impacts running of sales promotions in both these product categories. For example, better time management is critical for success of sales promotions in fresh produce business. This is due to the perishable nature of fresh produce and shorter shelf life. Whereas, promotions in ambient products are not time critical and this can be attributed to their relatively longer shelf life. Similarly, consumer demand changes considerably in fresh produce and weather play an important part in it. This impact is significant both in demand and supply side. On the other hand, consumer demand is fairly fixed in ambient category products and impact of weather on its supply side is also relatively less.

Despite having significant differences in all of these above aspects, suppliers of both these categories are doing sales promotions in a similar fashion. They are influenced by retailers at every stage of promotional cycle but level of retailers influence varies with type of brand (own label vs. brand label). Own label fresh produce suppliers are relatively more under the influence of retailers during sales promotions. This was also observed by Garretson, Fisher &

Burton (2002) who reported significant variation in strength and direction of relationship of retailers during sales promotions with the own label as compared to national brands. They observe retailers are pushing own label suppliers for frequent promotions so that better price can be negotiated with brand label suppliers due to competition. They also reported erosion of brand loyalty due to excessive promotions by both national and own label suppliers. This difference in the level of retailers influence due to ownership of brand ( own label Vs Brand label) was not captured in the proposed research framework.

Similarly, majority of food suppliers are employing more price promotions as compared to non-price promotions. They are choosing price promotions without taking into consideration the impact of discount levels on costs and differentiated consumer response due to sales promotions. Their over reliance on price promotions are not supported in literature. Hardesty & Bearden (2003) showed that if low or medium benefit levels are present consumer does not value price or non-price promotions any differently. Also, the effects of promotions vary with the product category, target market and type of promotional activities (Sigué, 2008). Majority of the suppliers did not consider these important factors while deciding about the type of promotion.

After a brief introduction about the overview of overall suppliers' promotional practices, next section will discuss specific suppliers' practices at every stage of promotional cycle relevant to literature and framework.

### 3.4.1 Setting of promotional objectives

Majority of fresh produce suppliers were own label as compared to ambient category supplier who were brand label rapeseed oil producers. This difference in branding was influential in setting of promotional objectives. No formal promotional objectives were observed in fresh produce suppliers as compared to ambient category suppliers. Ambient category suppliers were less under the influence of retailers while deciding about the promotional objectives. Despite having differences in retailers influence both of them are setting similar promotional objectives. Their main short term promotional objective was to increase product volume in a shorter period of time. This was in line with finding of Nguyen et al., (2013) where promotions has shown to increase product sales volume and market

share in promotional period. Despite positive impact of promotions on product volume, there are varieties of demand and supply factors affecting promotional outcome (Brito & Hammond, 2007). But despite suppliers claims for consideration of different supply and demand factors (i.e. production costs, replenishment cycle, increased customer demand) they practically measure sales promotions only by increase in sales volume.

Their long term promotional objective ranges from increasing the customer base to expanding the product category. These long term promotional objectives are supported by Sigué (2008). But he also showed that long term promotional objectives are affected by target market, product category and type of promotion. Only apple supplier showed better orientation of these long term promotional effects. All other suppliers were only interested in increasing promotional volume with little knowledge of its impact on their customer base and supply chain cost. This current practice of planning promotions keeping in view only promotional volume is captured in research framework derived from literature review. The framework also measures the promotional uplift by increase in promotional sales as observed from both type of suppliers.

None of the suppliers are linking their promotional objectives with specific promotional mechanics and/or customer segment. This practice is not supported in literature, where Thackeray et al. (2008) showed that sales promotions can be more cost effective for suppliers if specific customer needs are considered early in the sales promotions process. These customer specific promotions are more successful as its 'created for the people by the people'. They advocated the use of customer segment data as a building block for designing effective sales promotions. This gap is also highlighted in research framework which proposes that segmented consumer demand at the promotional planning will improve promotional sales.

Goodwin (2002) showed that managerial judgments are used to directly forecast sales in sales promotions environment. This practice strongly depends on the nature and attitude of the personnel involved. A similar phenomenon was observed in promotional objective stage of both types of suppliers. They mostly rely on their judgement to predict the promotional sales and this judgment was more on a gut feeling then any statistical method as shown by

Goodwin (2002).This attitude was more common in fresh produce suppliers as compared to ambient counterparts.

After discussing promotional objective stage of suppliers and its relevance in literature and research framework, next section will compare promotional planning of both types of suppliers.

### 3.4.2 Promotional planning

Ailawadi et al. (2009) highlighted three key challenging areas in promotional planning. They are whom to target, what promotions to use and how to design effective promotions. These key areas also set the future direction of sales promotions and plays vital part in promotional strategy. These three important factors influence both supply and demand side in promotional planning. Suppliers claim to manage supply side of the promotional planning by maintaining dependable systems to manage the extra load of sales promotions. But they were less confident about planning consumer demand in planning stage. Ambient suppliers claim to have better knowledge of target customer as compared to vegetable suppliers. Apple suppliers on the other hand claim to have explicit knowledge of target customer. But all of them fail to associate this knowledge in designing customised promotional planning. This gap is shown in research framework where use of disaggregated consumer information in promotional planning is shown to impact production and distribution planning of promotions.

Weather plays an important part in the decision making of promotional planning stage of fresh produce suppliers. This practice was also observed by Caliskan (2013) where seasonal suppliers were significantly more under the influence of weather in promotional planning. They plan to give weather linked price discounts for their seasonal product to induce consumers to make early purchase. This impact of weather on the promotional planning of fresh produce suppliers was not highlighted separately in the planning stage of research framework. This was due to the fact that weather is taken as an inherent planning consideration by fresh produce suppliers as shown by Caliskan (2013).

Time to plan promotions and level of integration in different departments also plays an important part in the promotional planning process and these factors are depend on the type of product and consumer demand (O'Leary-Kelly & Flores, 2002). Ambient suppliers are more integrated and had more time to plan promotions as compare to fresh produce suppliers. Whereas, product with more demand uncertainty like fresh produce benefit more with better integration in sales promotions (O'Leary-Kelly & Flores, 2002).

Park (2004) showed that retailers have different level of cooperation with suppliers depending on their promotional support, product offering and targeted customer segment. Similar phenomena were observed with ambient suppliers. Their product was relatively new and have small market share so they experience less retailer support in promotion planning stage.

Despite having different factors like weather, level of integration and retailers cooperation affecting suppliers promotional planning, their promotional waste was very less. This seems more surprising given the stated inaccuracy of consumer demand forecast in sales promotion. Fresh produce suppliers reported consumer demand accuracy in the range of 50-100 percent whereas, demand inaccuracy was significantly less for ambient suppliers (10-20 percent). These ranges of stated demand inaccuracies was in contrast with stank (1999) who reports an average of 90 percent demand accuracy in food industry during sales promotions. Despite having such wide range of demand inaccuracies both type of suppliers reported very less promotional waste (1-2 percent). This figure was also not supported in literature where promotional waste of food suppliers ranges from 10-30 percent (Mena & whitehead, 2008). This difference in promotional waste can be due to the fact that suppliers channel their low quality by product in secondary markets.

After discussing different aspects of promotional planning of suppliers, next section will highlight current practices of suppliers in promotional execution stage and its relevance in literature.

### 3.4.3 Promotional execution

This was the third stage of promotional cycle where promotional plan is practically executed. Transportation management was one of the key challenges observed in the promotional execution of rapeseed oil supplier. They have to manage extra promotional load by increasing responsiveness of transportation fleet. Due to the use of consolidators they were restricted in capacity and flexibility to respond to extra promotional load especially during weekends. Croxton et al. (2001) also advocated the synchronization of sourcing and distribution as per the company's capacity and flexibility during uncertain demand. They proved that better demand management and compatible firm's resources helps in managing extra promotional load. This phenomenon was not important in the vegetable suppliers as its pick to order product so they supply directly from the field to the depot. But storage was an important factor in promotional execution for apple suppliers. They have to execute promotion keeping in view in season fruit production. They have to maintain cold storage of apples in off season to provide all year supply of fruits.

Own label fresh produce suppliers have less control during promotional execution as retailers own the brand and control complete execution process. This lack of control puts them in reactive mode during extra promotional load. They have to adjust to the needs of retailers and employ additional resources during the promotional period. This puts pressure on production and distribution. This extra load on production and distribution was also captured in research framework which shows promotional impact is significant on firms ability to produce and replenish.  Nature of the product also plays an important part in this process. As fresh produce has shorter shelf life and greater perishability so management of additional load during sales promotion has to be time critical. Srinivasan et al. (2004) has shown in figure 1 that different product even in the same product category with similar promotion can have different effect on retailers and suppliers revenue.

Fig. 1:    Impulse-Response functions

A: Impulse response function of a price promotion of one cent per ounce on manufacturer revenue
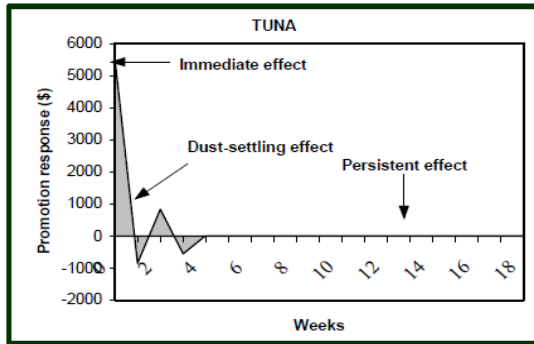
B: Impulse response function of a price promotion of one cent per ounce on retailer revenue
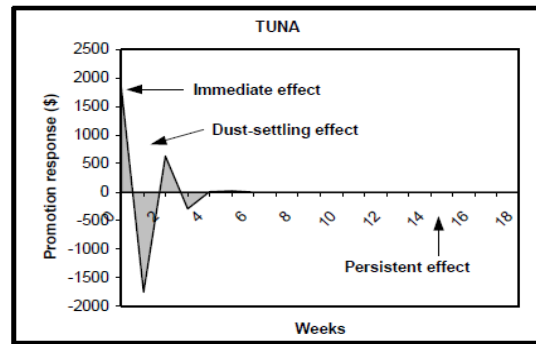
C: Impulse response function of a price promotion of one cent per ounce on manufacturer revenue
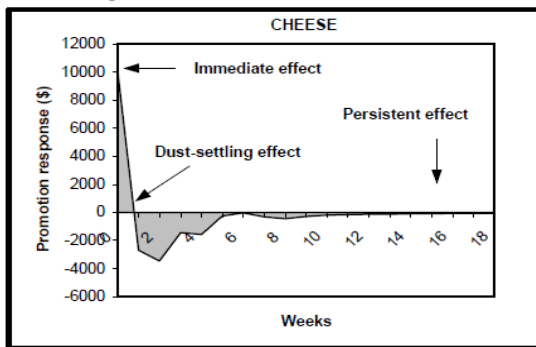
D: Impulse response function of a price promotion of one cent per ounce on retailer revenue
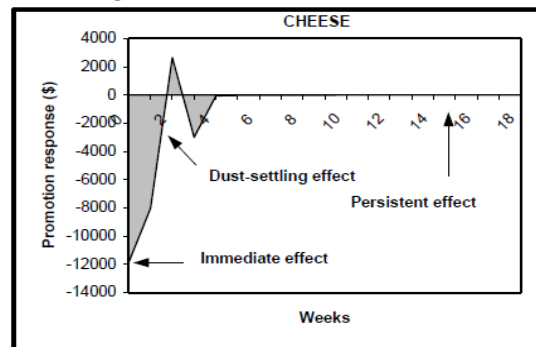
**Figure 5.1** incremental effect over time of a price promotion to suppliers and retailers revenue

After reporting the practical promotional execution issues and its relation in literature, next section will report about the comparison of promotional evaluation and feedback in both categories of suppliers.

### 3.4.4 Promotional evaluation and feedback

Graeff (1995) has shown that promotional feedback is an important step in promotional strategy of manufacturers and retailers. Promotional feedback will help in designing consumer specific products. He suggested understanding target customer market and communicating desirable product attributes in promotional messages. Customer feedback should be the last step in the promotional cycle where consumer behaviour should be

observed and communicated back into next promotional cycle. This strategy will also improve the purchase intention of target customer in next promotions. For this research both type of suppliers expect apple suppliers are either doing very little or no promotional evaluation and feedback. On the other hand apple suppliers claim to evaluate promotions quiet frequently and mutually with retailers. But they are also evaluating promotions on change in volume and do not consider target consumer demand as advocated by Graeff (1995). Similar gap is captured in research framework where promotional feedback from targeted consumer is feed back into next promotional planning and execution stage

Vegetable suppliers are defending lack of promotional evaluation and feedback due to their past practices. They were earlier more focused on the farming side and less on the marketing dimension of sales promotions. Similarly, ambient suppliers blame time and resources for the absence of promotional evaluation.

After comparing different stages of promotional cycle, next section will summarize the cross case comparison.

### 3.4.5 Summary

There are significant differences in doing business in ambient and fresh produce categories. These differences are due to the nature of product, difference in consumer demands and associated supply chain issues. These differences impact running of promotional cycle as well. Despite these significant differences majority of these suppliers are surprisingly doing sales promotion in a similar fashion. They are mostly employing price promotion with various discount levels and their main promotional aim is to increase their product volume in short term. Pervious sales performance of product and managerial judgment informs their promotional planning and consumer demand information is not included into their promotional cycle at any stage.  Whereas, their key challenge during promotional cycle is to manage uneven consumer demand. They are not linking any promotional objective with specific promotional mechanic. They are strongly influenced by retailers in all of the stages of promotional cycle. This strong influence compel them to design retailers specific promotions not consumer focused sales promotions. They are not using any type of

customer segmentation information in their promotional cycle despite having access to their consumer demand data. They are not performing any significant promotional evaluation and feedback and consequently running similar sales promotions again. Suppliers are managing promotional cycle which is influenced by complex interplay of demand and supply factors in an overly simplistic manner.

After discussing the results of small food suppliers from both product categories, a retail buyer and a store manager were also interviewed in order to gain the retailer's perspective on the promotional cycle.

## 3.5 Retailer's perspective

### 3.5.1 Introduction

Based on the observations from the suppliers' interview and the literature review a modified semi-structured interview guide was used (see annex B)

There were some interesting observations some of which validated and others contradicted the views of the suppliers.

### 3.5.1 Setting of promotional objectives:

Retailers treated national and local suppliers differently due to different business interests and amount of time available with the buyers. They highlighted two types of promotions namely WIGIG (when its gone it's gone) and national promotions. First type is usually seasonal and based on fixed amount produced so if the product is sold out there is no replenishment. In both the types there is no set process of setting the promotional objectives for each product as evident from buyer's statement


*'Theoretically the buyer and supplier should agree what uplift goanna be..... There is no one way or set way of doing it'*

As this process is strongly depend on the type of product promoted and share of promoted product in the buyers business so setting of promotional objectives does not seems to be formal for small food suppliers as reported earlier from their interviews in above sections of both case studies.

Their setting of promotional plan is also depend on the amount of time and number of suppliers they have to deal with as evident from this statement below

*'Because of the time, for a local product we have 106 supplier we sit with them and do it in half an hour but for national brands we have only four, so we use forecasting system'*

Despite having similarity in views about setting the promotional objectives retailers use only one criterion for measuring promotional performance as discussed in next section.

### 3.5.2 How promotional objectives are measured?

Suppliers reported different measures for calculating the success of promotions but retailers seems to be interested in one measure 'promotional uplift' measured in percentage. This conflicting view supports the findings of literature where Dawes (2012) showed that retailers are more interested in category expansion as compared to suppliers who wants volume gains during promotions. Measuring promotions by percentage uplift was evident from the statements of retailers

*'So like you and l negotiate that this promotions is coming up so in terms of how much will be sold will depend on the uplift two three times or five?'*

This measure is different from small food suppliers, who see promotions to achieve more long term impacts like new product development, customer engagement and increasing return on investments. This reason for this measure can be justified by the retailers as the scale of different customers they are dealing weekly as evident from this statement below

*'We have 20 million customers shopping with us every week'*

After highlighting the differences between the suppliers and buyer about setting of promotions, next section will discuss the source of information while planning sales promotions.

### 3.5.3 What information is used to inform the planning process?

From suppliers interview it looks like promotions are planned by keeping previous sales history so when retailer was asked about the source of planning sales promotions it they partially agreed about using previous sales history as evident from statement below

*'Probably, I think it will be negotiated differently with different categories'*

They claim to have a sophisticated forecasting system who takes into account all the complex demand and supply factors for estimating sales during promotions but at the same time they accepted the fact that personal judgment based on their experience also comes into play while taking these decisions as evident from their statement below.

*'It's based on the store profile, customer types along with the uplift. It more sophisticated... Also we sometimes use our own experience to forecast the demand and ask for it from supplier'*

Similar findings were observed from literature review done earlier where (cooper et al., 1999) showed that historical sales data is used to plan promotions and can aid in corrective actions during promotional cycle.

Clearly having the choice of using either the forecasting system or previous experience for deciding about the promotions makes its less sophisticated in estimating accurate sales uplift. They seems to use forecasting system mostly on national fast moving product lines and use more experience in local suppliers as evident from the statement below when asked about the reason for not using the forecasting system for local lines

*'It is probably used by the seventy percent for national buyers. If it goes wrong then I get twenty shelves complaining. Local lines go unnoticed'*

After discussing the source of information for planning sales promotions and its relevance with literature and small supplier interviews, next section will discuss the key consideration while allocating the stock during the sales promotions.

### 3.5.4 What are the key variables on which planning are focussed?

Another important factor arising from retailer's interview was the importance of featured space in the store. They give priority for stock allocation to those products that are allocated prominent space in the stores. These products were mostly from national brands and so prioritized by retailers on local brands. Use of feature space for allocating stock is evident from the retailer's statements below

*'So products that have featured space like gondola ends or additional space will be better accommodated in terms of promotions stock... its more about getting enough stock in the depot that go quickly enough'*

This clear distinction for stock allocation to national brands also supports the main argument of this research which says that small food suppliers are low on priority and therefore requires better understanding of their customers to defend their market share in competitive grocery sector.

Another interesting observation from the retailer's interview revealed the concept of reserve during promotional cycle. This was the minimum stock levels on top of normal stock maintained by the retailers during the promotional cycle in anticipation of consumer demand. It is one of the important variables built in the system where a minimum cover is maintained before re-ordering is triggered as shown from the statement below

*'Yes till the time it will not use your reserve. So this is the minimum you must hold and if you are having a promotions then there is a cap on top of it. So the stock is two case instead of eight cases so theoretically we have x number of cases and we keep replenishing that until that has gone'*

Despite having reserve as minimum stock, no formal input of store manager was observed during the promotional planning or stock allocation process. Retailer internal system is designed as such which discourages the influence of store managers on the stock allocation. This is evident from their statement below

*'I can only speak for convenience but no. I can see the forecasted and have reasons for concern but I can only send an email and cannot influence the stock cover'*

This lack of flexibility due to the reduced store managers input can potentially increase stock-outs in one store and waste in other. Similar observations were recorded by the suppliers about the stock visibility and ability to manage it in the stores.

After discussing different aspects of the promotional planning process of retailer's next section will report about the stock allocation during promotional execution.

### 3.5.5 Promotional execution

This section will discuss what retailers practically do to allocate stock during promotions. Despite recognizing the fact that consumer demand varies from store to store they give blanket cover to all the stores based on the percentage uplift. When retailer was asked why can't a store demands more from depot if the stock has run out and statement below shows the level of cover they allocate to counter it

*'No it cannot. But as it's a blanket cover it should cover generally it does. As our stores aren't running out of stock everyday so the system is not broke'*

They are providing a blanket cover to all stores universally but this practice can have the potential to increase mismatch between supply and demand. They accept that consumer demand is heterogeneous at the stores and so should not be treated equally. But they employ gap scan to access the level of stocks in the stores and adjusts the stock ordering as per the store level demand. This practice is also supported by the fact that they replenish the stock twice in one day as shown from their statement below

*'Yeah, it adjusts to it almost immediately. As sales based ordering system will knows that'*

They claim to have a robust system in place which manages the stock at the store level with 95 percent accuracy but at the same time accept the fact that a significant stock is present in back store which is unsold. Therefore, if we consider the fact that local suppliers have limited resources and their ability to do business can be impacted significantly if either stock-out or unsold stock occurs in store. Retailers were asked about the penalty costs of un-sold stock and its consequences for suppliers and their statement was

*'Previously it used to be the suppliers responsibility. But due to new regulation this is more of a collaborative thing and we don't penalize them'*

It is evident from the statement above that retailers are working more collaboratively with the suppliers and it was also reported in literature by Gajanan, Basuroy and Beldona (2007) as category management. This practice helps grocery industry to share information and do more informed decisions about stock allocation and so better resource management. Next section will summarize the observations from retailer's interview about the promotional cycle.

### 3.5.6 Summary

It is clear from the above sections that retailers hold a peculiar view of promotional cycle keeping in view the needs and wants of their own organization. They are dealing with 30,000 products daily with each having a particular promotional plan as per product category. Therefore, each buyer is supported by its in-house team of experts who helps in managing the complete promotional cycle from setting of promotional objectives to its execution. Despite having dedicated teams to support retailers stock allocation seems too universal and aggregated. They have blanket stock cover policies which can leads to unwanted stock or stock-out conditions.

Similarly, having the choice to either use forecasting system or own judgment can potentially leads to practices which are not sophisticated enough to represent the complex ground realities of demand and supply factors. Although they have a robust system of gap scan which can adjust to the irregularities of stock based on actual sales scenarios but even that system is operated by humans who may guide the system based their experience.

Most of their stock allocation decisions and execution plans are guided by the product market share and its impact on their business interests. This makes national brands on preferential positions as compared to the local small brands. Therefore, small food suppliers have to understand their customer better and consequently produce matching supplies to remain in the competitive grocery business. Although retailers has systems in-place which can help them make more informed decisions about the promotional stock of small food suppliers but due to amount of time and competing priorities they prefer to rely more on their gut feeling and experience.

The system design of stock allocation where store managers has limited influence in the stock of their stores can potentially reduce the flexibility to match unexpected demand with the supply at store level. Similarly, absence of local suppliers format contact with the local store manager also reduces the level of collaboration which can improve the demand management at the store levels.

They clearly have better contingency space management systems in place which can manage the capacity constrain in the event of high demand. But these plans are heavily tilted in favour of national brands as their products are fast moving and occupy featured space in the store. Pre-loading national brand in stores can also reduce the promotional space for the small suppliers leaving them at a position of disadvantage. Therefore, it is absolutely vital for small food suppliers to understand the consumer demand well so that he can use his limited resource to the best of his advantage in highly competitive market dominated by national brands.

The links between the findings from the interviews and the results of the literature are summarised in Table 3.

| Promotional objectives | | Promotional Planning | | Promotional Execution | |
|---|---|---|---|---|---|
| *Interviews* | *Literature review* | *Interviews* | *Literature review* | *Interviews* | *Literature review* |
| '*There is an element of we know it works, we have done it before. Gut feeling/ Experience of what happens in previous different stores*' | Managers integrate their own judgment with known empirical relationships between variables (i.e. historical sales) during promotions (Neslin et al., 1983) | '*I need to sell, sell and sell. I am selling 150,000 litres a year. I have to get it 500,000 litres per year*' | Demand information is an important part in the planning process of promotions. It has direct effects on production, inventory control & delivery plans (Lummus et al., 2003). | '*The production capacity is enormous as compared to our ability to sell. Historically production, packaging or distribution has not caused us any issue*' | Allocation of shelf space in the stores is influences by multiple external factors, including promotions, seasonality and variation in category demand for different products( Desmet et al., 1998) |
| '*The weakest bit for us is the forecast ...It varies between 50-100%*' | Both retailers and suppliers express concerns about high demand fluctuations during promotions and the accuracy of forecasts for inventory management (Ettouzani et | '*You have your historical data, sales figure from the previous season. You have the data from grower where they will tell you when they* | Linking consumer demand data with upstream processes can reduce the impact of variable demand. The lack of information sharing can result in higher | *But the biggest problem was us is the weather, as this changes the demand level. It's fluctuating.* | Seasonal fluctuations along with variations in the weather were shown to impact inventory levels in stores and increase the risk of stock-outs during sales promotions (Ramanathan et al., 2010) |

| | | | | | |
|---|---|---|---|---|---|
| | al., 2012) | *are ready to take the access crop'* | productions costs, inventory levels and wastage rates (Taylor and Fearne, 2009) | | |
| *'It's between 1-2 percent. From our point of view there is no promotional waste'* | Out of stocks on promoted items were higher than non- promoted items in general by a 2:1 ratio (promoted vs. non-promoted out of stock) (Gruen et al., 2002) | *'No, we don't sit down but we do speak. It's not like that now we have promotional planning meeting'* | Sales promotions are implemented with inadequate planning & poor information management, resulting in the continued erosion of profits & brand loyalty (Felgate et al., 2012) | *'We have very less control over the implementation process so it's not easy to highlight one as Tesco is practically managing that end'* | A balance promotional execution plan is about balancing manufacturing requirements with distribution capabilities of firm (Croxton et al., 2002) |

**Table 3** The links between the key findings from the interviews and the results of the

literature review

Looking at Table 3, it is clear that there are contrasting perspectives on the way in which retail promotions are planned and executed. Suppliers plan promotions taking into account previous sales volumes, whereas retailers measure promotions on percentage uplift. Both these measures are done at the higher level of aggregation reported in the literature (Ramanathan et al., 2011; Thomassey et al., 2006). This aggregation masks the underlying relationships of different demand variables (i.e. customer preferences, seasonality) with promotional sales. On the other hand, both agree that the level of collaboration is not high between them. Retailers blame it on bigger business interests and time, whereas suppliers consider it a challenge to convince retailers to listen to them. This was also observed by Garretson, Fisher, and Burton (2002), who reported significant variation in strength and direction of relationship of retailers during sales promotions with the own label as compared to national brands. For suppliers, demand accuracy is a problem but the retailer treats its forecasting system as sophisticated. The literature is divided on the range of demand inaccuracy in the food industry, with some authors reporting it at 10 percent (Stank, 1999) and others claiming it to be nearer 30 percent (Mena & whitehead, 2008). During promotional execution, retailers prioritise national brands over small local brands due to the rate of sales, whereas suppliers try to manage increased demand through additional resources. This disparity around information use, demand forecasting, and stock allocation creates hurdles for a profitable and sustainable promotional cycle for both suppliers and retailers.

# CHAPTER 4- CONCEPTUAL FRAMEWORK & RESEARCH PROPOSITIONS

## 4.1 Introduction

From the literature review and the expert interviews, the promotional cycle can be divided into four important stages (Little, 1975: Neslin et al., 1983: Cooper et al., 1999). First stage is setting of promotional objectives in which retailers and suppliers collectively decide about the aims of promotion (in terms of promotional uplift, category expansion, trail of new product or increase in customer base) as shown by Sigue (2008). These objectives are also dependent on conflicting interests of both retailers and suppliers (Park, 2004). This is followed by a detail promotional plan to achieve it which forms the second stage of promotional cycle. This stage can be made more effective with the use of consumer purchasing data at the stores as shown by Andrews et al. (2011). This has shown to reduce the costs of promotions and helped in designing effective promotions (Ailawadi et al., 2009). These two important stages are shown in a single box in research framework (figure 3.1) as inputs to third stage (promotional execution). It was observed from the stakeholder's interview that they don't treat setting of promotional objectives as a formal process rather a part of promotional planning process. Therefore, setting of promotional objectives as a distinct stage in collaborative information sharing (Anderson et al. 2000: Croson et al., 2006) was not supported by the stakeholders. Possible explanation can be less amount of time available with retailers and multiple roles adopted by small food suppliers due to the size of the firm.
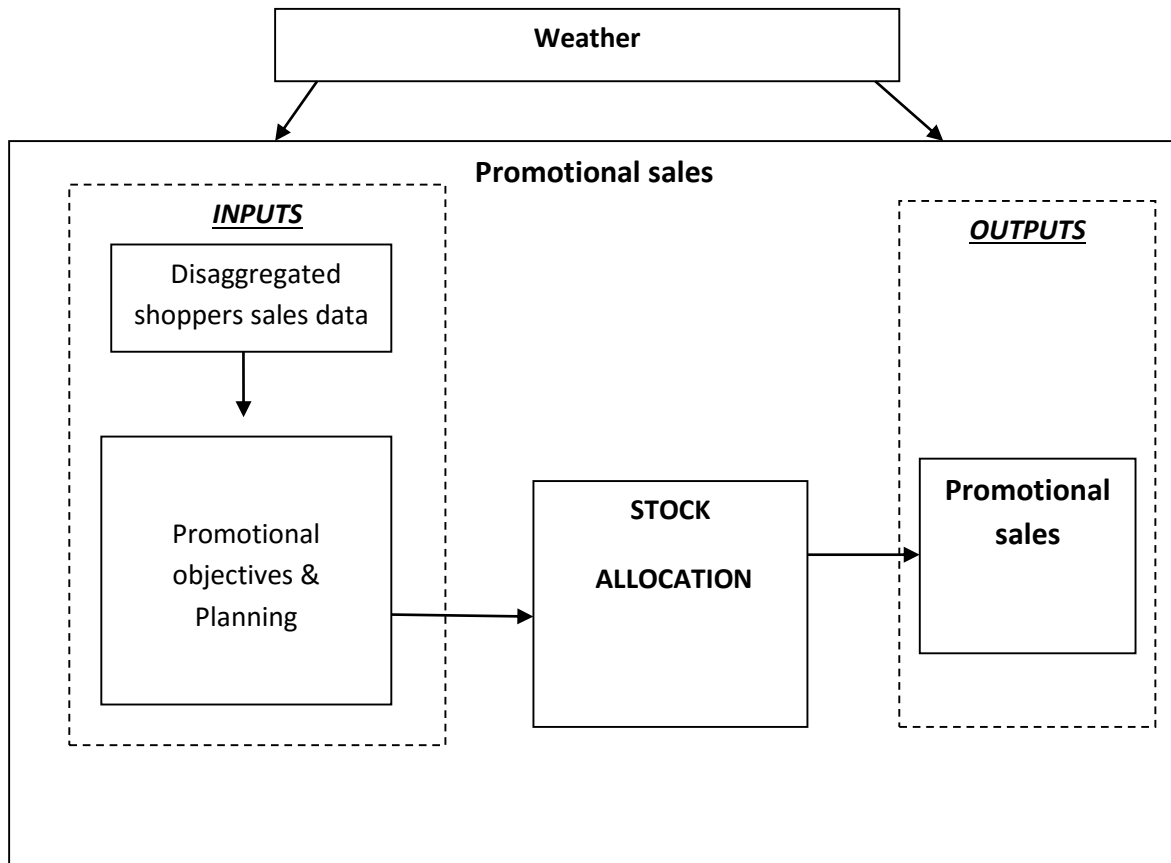
**Figure 4.1:** Research framework

Promotional execution is the third stage where the objectives agreed earlier and consequently formulated plan is practically executed. This is strongly dependent on product category, targeted market and type of promotional mechanic applied as shown by Thackeray et al. (2008). It also significantly impacts the inventory management during promotions at the store level (Zhang et al., 2007). In this research we are measuring the promotional execution by looking into the stock allocation at store levels. This is done by linking consumer demand observed at store level through loyalty card data with the stock allocation at similar stores. This type of information sharing with the supply chain during promotions is strongly supported by Quinn et al. (2007).

Another important exogenous factor (weather) affecting promotion is also taken into account as it affects both shoppers demand and promotional outcome. Literature has looked into impact of weather on promotions by observing its effect on store performance, consumer demand structure and as an important planning variable in promotional

forecasting methods (Lam et al., 2001: Ramanathan et al., 2010: Copper et al., 1999). But its impact on stock allocation and disaggregated consumer demand at store level is still unknown, therefore it is included as an important variable impacting both demand and supply side as shown in figure 5.1 above.

This is the research framework of a promotional cycle of fast moving consumer goods (FMCG's) particularly in the context of small food suppliers. Shopper's sales data shown in figure 4.1 will be disaggregated at three levels (types of shoppers, type of store format and level of customer penetration) as shown in table 5.1 below.

| Type of shoppers | UP market | | | Price sensitive | | |
|---|---|---|---|---|---|---|
| Type of store format | Extra | Supermarket | Metro | Extra | Supermarket | Metro |
| Level of customer penetration | High customer penetration | Low customer penetration | | High customer penetration | Low customer penetration | |

**Table 4.1:** Three levels of disaggregated demand

As evident from the table above, first level of disaggregation is done at socio-economic level. Shoppers demand from two types of segments is observed. These shoppers are identified in this research as upmarket and price sensitive. This classification is done by the retailers based on the socio-economic factors of shoppers. Upmarket customer stores are those categories of stores where majority of shoppers belong to affluent segment of the society. Similarly, price sensitive stores are those stores where majority of shoppers comes from less affluent segment of society. These classifications are also supported by literature where Kucera (2014) has shown that consumer behaviours are strongly impacted by the social factors during the sales promotions and use of this information by the retailer helped him in making informed decisions which resulted in increased revenue during promotions.

After differentiating the stores on shopper segments it is further disaggregated to store size. For this research three different store sizes (extra, supermarket, metro) are used. Different store sizes have different stock allocation requirements. This has to be linked with the

shopper segments as proposed in this research. This is supported by the Andrew et al. (2011) which has shown that consumer demand models will produce more accurate results if consumers are segmented in homogenous groups based on store level data. They also showed that store level data can be used for understanding the impact of marketing variables on the stock allocation of individual stores.

Customer penetration is another important factor while considering promotional outcome. High customer penetration stores requirements for stock can be significantly different as compared to low penetration stores of same size. These three levels of desegregations help in observing promotional scenarios with homogeneity of demand. Therefore for each promoted product twelve promotional scenarios will be created.

These scenarios are as follows 1)upmarket extra high customer penetration 2)upmarket extra low customer penetration 3) upmarket supermarket high customer penetration 4)upmarket supermarket low customer penetration 5)upmarket metro high customer penetration 6)upmarket metro low customer penetration 7)price sensitive extra high penetration 8)price sensitive extra low penetration 9)price sensitive supermarket high penetration 10)price sensitive supermarket low penetration 11)price sensitive metro high penetration 12)price sensitive metro low penetration.

After discussing the research objectives and research framework, next section will discuss the research propositions arising from them.

## 4.2 Research Propositions

The over-arching proposition which this research seeks to explore is that a more effective use of disaggregated sales data, for specific products, specific promotional mechanics at specific times of the year will lead to greater co-ordination of supply and demand and result in higher levels of promotional revenues.

Specifically, in the fast moving consumer goods (FMCG) sector, co-ordination of supply and demand is critical. This is due to capacity and perishability constraints on the supply side and the proliferation of competing products and heterogeneous consumer preferences on the demand side, making it difficult to forecast how much to make, where and when to move it

and who to target. This research will determine the benefits of using dis-aggregated sales data in improved planning decisions (promotion, production, distribution) and the execution of the planning process (production management, distribution management and shelf replenishment) at critical stages within the supermarket supply chain.

Different factors like life style, life stage and demographics from loyalty card data has shown to affect the individual shopper significantly during sales promotions (Felgate et al., 2012). These factors have implications for supply chain management in promotional planning and execution. Production planning, distribution management and shelf replenishment are very crucial at supply and demand interface as identified by Arshinder et al. (2008). Production, distribution and replenishment were identified as three of the significant supply chain causes during promotional execution by Ettouzani et al. (2012). This has significant implications both for retailers and suppliers in increasing sales. This is in line with the conclusions drawn by Mantrala et al. (2009) and results in the following three research propositions arise from this research framework. First propositions relates to actual shopper behaviour and stock allocation. The other two relate to the methodological contribution to the promotional cycle.

### *Proposition No.1*

A stock allocation informed by **disaggregated shopper sales data** will result in increased promotional uplift

### *Proposition No.2*

- **Real** promotional scenarios can be **simulated** &

### *Proposition No.3*

- The promotional 'problem' can be **optimized**

Therefore, the use of disaggregated sales data will lead to better decision making about consumer demand and stock allocation during different stages of the promotional cycle (setting of promotional objectives, promotional planning and feedback). This improved decision making can be done if the real promotional scenarios can be generated. This

simulation of reality will result into accurate prediction of consumer demand and consequently stock allocation to stores can be optimized. This will result into improved promotional performance (increased promotional revenues).

In order to validate the research framework and explore the research propositions further, the promotional cycle of four different types of products (own label 1 kg carrot, own label mango, brand label rapeseed oil & sunflower oil) were selected based on their differences in shoppers appeal, product characteristics (fresh Vs ambient), brand ownership (own label Vs brand label), differences due to the weather & seasonality on their demand & stock allocation.

Having explained the conceptual framework and the research propositions, the next section will discuss the research methodologies adopted.

# CHAPTER 5- RESEARCH METHODOLOGY

## 5.1 Introduction

This section aims to review the research philosophy for this research, different methodologies for measuring factors affecting short term promotional impacts and then justify the chosen approach. Initially, alternative approaches will be explored to observe the promotional impact due to consumer behaviours and associated supply chain.

## 5.2 Research Philosophy

This research lends itself to the epistemology of the positivist paradigm which uses an ontological assumption that reality is external and objective. It is assumed that knowledge is only of significance if it is based on observations of this external reality (Easterby-Smith et al., 2008: p57). SME marketing and operation management are at the heart of this research, both of which are external and objective realities the analysis of which requires unbiased data collection. In this context the researcher is separate from the reality they are studying and the data being collected are less open to subjective bias (Saunders, Lewis and Thornhill, 2009: p113). Positivist research favours the use of a more structured methodology in order to facilitate replication (Gill and Johnson, 2002). In the context of this study, the aim is to establish if a more structured approach to promotional planning and execution can be generalizable to all (food) SMEs and, if adopted, will result in improved promotional performance., as measured, objectively, by the associated increase in (net) revenue.

**Approaches for analysing promotional impacts**

Researchers have adopted different methodologies to observe the impacts of consumer behaviour on sales promotions. The choice of the method depends on

- The data availability
- Nature of promotional response
- Specific objectives of the study

However, some common methodologies that have been identified in marketing and promotional literature will be discussed in the subsequent sections.

## 5.3 Regression Analysis

Simple and multiple linear regression modelling have been used to study different types of promotional response. Bolton (1989) was the first to use a linear regression modelling to observe different product and brand elasticises. In his approach, sales of a brand were considered as a function of display activity, price and advertising. However, he considered one variable at a time and ignored the impacts of other situational variables.

Van Heerde et al. (2004) studied store level sales models and observed the impact of cross brand effects on each store during promotions using individual regressions. They showed that as the depth of discount increases, the effect of cross category demand also increases in stores.  In contrast, Martinez -Ruiz et al., (2006b) looked at a number of factors, including the day of the week and relationship between the sales of promoted and non-promoted products in the same category. They showed that weekends were the most effective days for promotions and that sales of promoted products had a significant impact on the sales of non-promoted products (cannibalisation) which significantly reduced the promotional impact at the category level. Thus, the use of multiple linear regressions is appropriate when the objective is to understand and measure the impact(s) of different variables on promotional sales.

Log linear regression has also been used to estimate the market response of sales promotions as it has the advantages of multiple and linear regression. It is especially beneficial for studying the interaction effects of different independent variables during promotions. Mace and Neslin (2004) have used Log linear regression to study the change in the market share of ten product categories before and after the promotions. They were able to link the effects of consumer characteristics on product sales along with the coupon and seasonality with the help of log linear regression.

Regression modelling is particularly suitable for working with large data sets and measuring relationships between specific variables. However, this technique is not suitable for analysing different promotional scenarios, where the objective is to maximise the sales

uplift (or minimise waste, stock-outs) subject to a number of constraints or distinguishing features – product, promotion, store type, shopper segment. Rather, it is proposed that regression may form part of a simulation model that seeks to explore the impact of changes to specific variables/factors under different scenarios, by establishing the relationships that exist between them. Thus, the results of regression analysis may form an input to a multi-dimensional simulation model that takes account of relationships between a variety of variables and is designed to measure the impact of several input variables on a variety of output variables under a range of circumstances (scenarios).

## 5.4 Time Series Analysis

This method is well suited to the analysis of promotional impacts over an extended period of time - the establishment of baseline sales in the absence of promotions and the prediction of sales uplifts over time. This prediction of sales based upon time series analysis is referred to as 'bump analyses' in the marketing literature (Haans and Gijsbrechts, 2011).

Multiple marketing studies (Dekimpe et al., 1999: Bronnenberg et al 2000: Pauwels et al 2002) have used VAR (vector auto regression) to study different aspects of sales promotions. Advantage of using this multiple time series method is that it helps to capture evolution of different relationships between multiple variables during a specific time period. Lim et al (2005) used VAR to study the permanent and adjustment effects of promotions on usage rates within a certain product category and its effect on brand loyalty. They showed that segmenting customer will improve the forecasting of accurate consumer demand over long term.

Pauwels et al. (2002) used VAR to estimate the long term impact of sales promotions on purchase quantities of both perishable and storable products. They showed that promotions impact negatively on incidence but positively on choice especially on long term. One of the advantages of this method was that it shows evolution of data generating process and helps to establish if there is equilibrium between dependent and independent variables.

This is particularly useful for managers as it helps with the planning of promotions and forecasting of manufacturing and distribution requirements, in advance, based on historical performance. The advantage of using time series techniques is that they are capable of generating robust forecasts of patterns that recur over time. However, the robustness of the forecasts is contingent upon the length of the time series. Moreover, in dynamic contexts, where the time series is subject to structural breaks ('shocks') the reliability of forecasts derived from time series analysis is reduced.

However, time series analysis is not appropriate for this study given: a) the dynamic characteristics of the fast moving consumer goods sector, b) the limited time series available (104 weeks), and c) the interest in scenario analysis as opposed to forecasting.

## 5.5 Simulation Modelling

Use of the word 'simulation' can be traced back to 1697 when it was used in linguistics. But Turing (1948) was the first man who used the word 'simulation' in computer sciences. Simulation modelling is defined by Naylor, Balintfy, Burdick and Chu (1966) as 'the numerical technique of conducting experiments on a digital computer, which involves certain types of mathematical and logical models that describe the behaviour of a business system over an extended period of time'. This can act as a decision support tool to predict and imitate the behaviour of a complex systems operating in real environments. It builds a systematic view and presents the holistic picture to aid in problem solving. It also helps to identify important aspects, factors and their relationship with the system along with its interaction with the environment. Figure 5.1 shows the broader scope of activities done in simulation study.

**INPUT**   **OUTPUT**

Quantitative   Output Data ⟹ Quantitative

information

**Data**

statistics)

(Model Parameters)   (Numbers)   (output

**SIMULATION**

*Input Analysis*

*Statistical Output*

*Data Collection*   Field Data   *analysis)*

Observation   *Verification*

Theory   *Validation*

Structural   Observation   *Reflection*
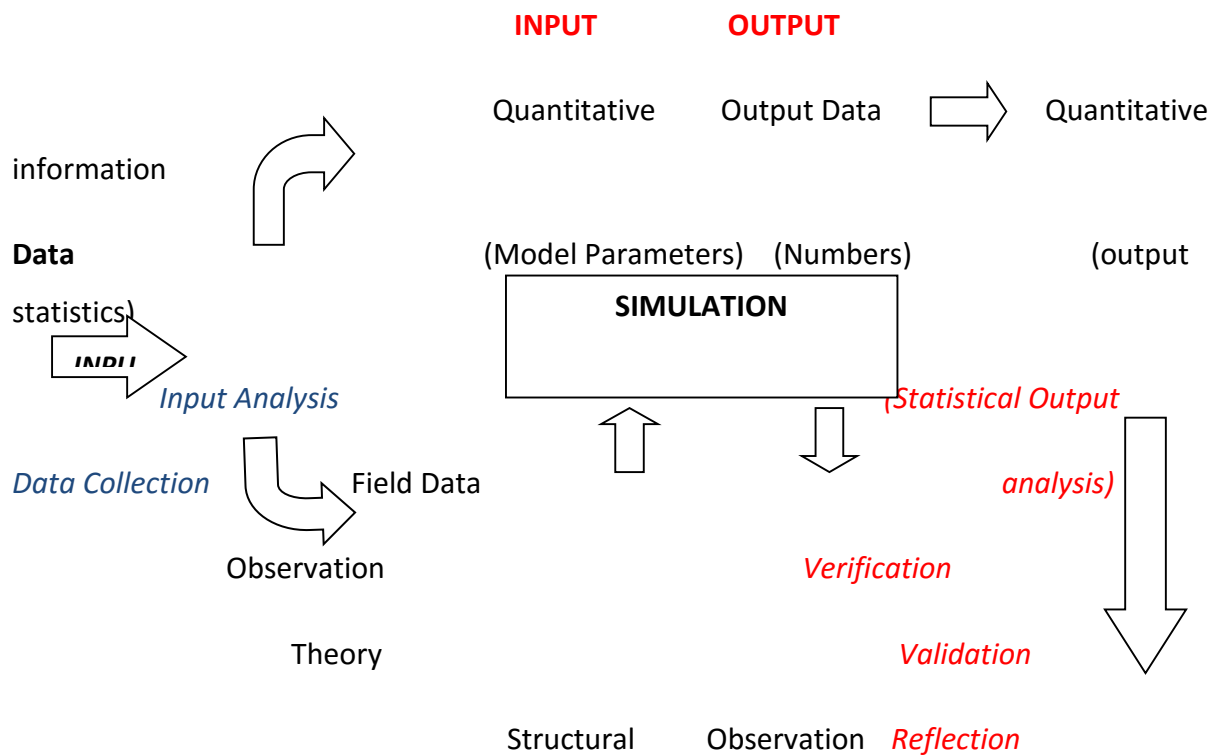
**Figure 5.1** Activities in the simulation study (White and Ingalls, 2009)

Promotional impacts are influenced by numerous environmental factors like seasonal demand, consumer behaviour, supply chain management and the characteristics of particular products and markets. Not only can these complexities can create difficulties in making the right decisions about the production, distribution and merchandising of fast moving consumer goods, they can also cause problems in measuring relationships between the different factors (inputs) and the specific outputs of interest. Analytical models are not effective in analysing and evaluating complex and intractable systems. The flexibility of simulation modelling in analysing different policies under different sets of operational conditions makes it more appropriate than analytical models, in the context of this research. Its less restrictive nature is well suited for the context of promotional impacts where estimation of various performance measures is important in decision making. Its emphasis on 'what if' helps in choosing from a list of alternative options (Ingalls, 2011).

The proposed research model in figure 5.2 will use Monte Carlo simulation modelling to study the promotional demand side factors and its associated supply chain factors under

different scenarios. Uncertainty will be added as a probability density function showing the range of values that can occur and the probability associated with each one. The flexibility of simulation modelling will allow inputting values which can be truncated to minimum and maximum with the help of domain experts. This is especially useful when studying a complex system with incomplete information.

### 5.5.1 Simulation model

For the purpose of validating conceptual framework derived from literature review and semi structured interviews, a simulation model based on disaggregated consumer demand was designed as shown in figure 5.2 below.

**Deterministic**

- Sales price
- Delivery amount
- Promotional mechanic
- Lost sales
- Target ending stock

**SIMULATION MODEL**

**Outputs**

- Total sales
- Excess Stock
- Stock outs
- Lost sales

**Stochastic**

- Weather(Bernoulli)
- Demand/Rainy(Probability density function) at three store format(extra, supermarket, metro) for upmarket & price sensitive shoppers
- Demand/Dry(Probability density function) at three store format(extra, supermarket, metro) for upmarket & price sensitive shoppers

**Figure 5.2**: Simulation model based on disaggregated shopper information

As shown in the simulation models there are two types of input to the model, deterministic & stochastic. Deterministic values used in the model were based on inputs from all stakeholders in the promotional cycle (suppliers, industry experts, retailers). These values represent important decision making information like type of product, type of promotion, delivery amount, pricing, stock cover & its associated costs and perishability. Although product positioning was identified as an important factor during promotional planning by some of the suppliers interviewed, information was not available to determine (or estimate) the impact this might have on promotional uplifts. Therefore, it was not included as a factor within the simulation model.

Stochastic values include probability density functions of two types of shoppers (upmarket, price sensitive) demand impacted by weather (rainy, dry) at three different store formats (extra, supermarket, metro). For this purpose software @ Risk was used as an add-on in Microsoft Excel. Shoppers were disaggregated based on their penetration. Higher penetration shoppers were grouped into high penetration category and low penetration shoppers were grouped into low penetration category. Customer penetration was defined as the percentage of customer buying the product at least once in last 52 weeks (one year) accessed via Dunnhumby database.

The proposed research model in figure 5.2 will use Monte Carlo simulation modelling to study the promotional cycle keeping in view both deterministic and stochastic values. The flexibility of simulation modelling will allow inputting values from different ranges with the help of domain experts. This is especially useful when studying a complex system like sales promotions where consumer demand can vary quiet significantly.

After calculating total sales, waste and net revenue at three different store formats with two types of shoppers(up market, price sensitive) with two different weather conditions(rainy, dry), an optimization model was designed for stock allocation. Therefore, for simulating shopper demand for two types of shoppers (upmarket, price sensitive) of four types of products (own label carrot, own label mango, brand label rapeseed oil, brand label

sunflower oil) and three types of store formats (extra, supermarket, metro) will result into different sets of simulation models to be fed into optimization model for each product.

For the purpose of this research, a comprehensive Monte Carlo simulation model based on the conceptual framework and the available data sources was designed. Demands of four different types of products were observed during their promotional cycle. In order to illustrate the design and model assumptions 1 kg own label carrot is taken as an example. 1 kg Tesco carrot for two types of Tesco customers (up market & price sensitive) across three types of store formats (express, supermarket and extra) were observed in six different promotional scenarios. It was observed for 6 weeks promotional period from 16th Dec 2013 to 26 Jan 2014. These scenarios were created to see differences in demand due to weather, type of customer, store format and its impact on inventory levels and revenues. Inputs to each scenario consist of different type relating to consumer demand, weather information, stock information and sales price. Below is a screen shot of one of the promotional scenario (price sensitive customers in metro stores).

Figure 5.3 spreadsheet:

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Area: | UK | no of stores= | 17 | store format= | metro | | | type of promotion= | £1.50 to £1.00 | |
| 2 | Store Type: | price sensitive | min= | 10 | target ending= | 40% of average sales during promotions | | | | | |
| 3 | Store Size: | 2.99-0.66 % customer peneteration | max= | 200 | average sales= | 57 | | | | | |
| 4 | Prob of Rain: | 0.7 | | | | | | | Delivery amount | Net revenue | |
| 5 | Demand | Rainy | Dry | | | | | | 10 | -£223.59 | |
| 6 | Distribution: | Weibull | Normal | | | | | | 20 | -£109.31 | |
| 7 | shape parameter | 1.349 | 62.667 mean | | | | | | 30 | -£5.74 | |
| 8 | scale parameter | 51.492 | 27.637 std dev | | | | | | 40 | £84.42 | |
| 9 | shift factor | 7.9456 | | | | | | | 50 | £159.66 | |
| 10 | Delivery Amount | 10 | units per week | | | | | | 60 | £219.03 | |
| 11 | Sales Price: | £1.00 | per unit | | Results | | | | 70 | £262.73 | |
| 12 | Lost Sales penalty: | £1.00 | per unit | | Stock Out: | TRUE | | | 80 | £292.53 | |
| 13 | Target Ending Stock: | 23 | units | | Total Sales: | 51 | | | 90 | £311.39 | |
| 14 | Excess Stock Cost: | £1.00 | per unit | | Lost Sales: | 268 | | | 100 | £322.39 | |
| 15 | Carry Over: | 0.3 | | | Excess Stock: | 0 | | | 110 | £327.78 | |
| 16 | | | | | Net Revenue: | £292.53 | | | 120 | £329.52 | |
| 17 | Week | 1 | 2 | 3 | 4 | 5 | 6 | Total | 130 | £329.00 | |
| 18 | Weather | 0 | 0 | 1 | 0 | 1 | 1 | | 140 | £326.98 | |
| 19 | Demand | 75 | 39 | 43 | 124 | 58 | 19 | 356 | 150 | £324.04 | |
| 20 | Sales | 10 | 10 | 10 | 10 | 10 | 10 | 60 | 160 | £320.58 | |
| 21 | Delivery | 10 | 10 | 10 | 10 | 10 | 10 | 60 | 170 | £316.75 | |
| 22 | Starting Stock | 10 | 10 | 10 | 10 | 10 | 10 | | 180 | £312.74 | |
| 23 | Ending Stock | 0 | 0 | 0 | 0 | 0 | 0 | | 190 | £308.61 | |
| 24 | Stock Out | TRUE | TRUE | TRUE | TRUE | TRUE | TRUE | | 200 | £304.41 | |

**Figure 5.3:** Screen shot of a typical simulation model- Price sensitive customer in metro store

As shown in the screen shot input figures of the model are in the blue colour. A typical simulation model consists of one of six types of promotional scenarios (price sensitive metro, price sensitive supermarket, price sensitive extra, upmarket metro, upmarket supermarket, upmarket extra). Numbers of stores in each category are based on customer penetration in that shopper segments for that store format. In case of price sensitive customers in metro store format category, there are seventeen stores as shown in the screen shot.

For each scenario, weekly consumer demand based on high or low customer penetration is accessed via Dunnhumby database and they are further classified as upmarket or price sensitive shoppers. As figure 5.3 is the scenario of price sensitive customer in low penetration category so, low penetration (2.99-0.66%) shoppers were selected. Then, this demand is further observed at a certain store format (metro, supermarket, extra). This disaggregated weekly demand is observed with two types (rainy vs. dry) of weekly weather during six week promotional period via met office website. Demand patterns during both rainy and dry weather are fitted to see which probability density function is suitable for a certain type of customer in either dry or rainy weather. During six weeks of promotional period (16th Dec 2013 to 26 Jan 2014) the probability of rain was 70 percent. Therefore, weather each week was defined by Bernoulli probability density function with the p value of 0.7(as shown in cell B4 of figure 6.3).

Delivery amount is inputted based on minimum and maximum of historical demand in that scenario. For example in this scenario (price sensitive customer in metro store format) historical demand varies from 10 units to 200 units of 1 kg carrots bags. Therefore, delivery amount will start from 10 units in the steps of 10 till 200 units to see when is maximum net revenue is generated. In this case maximum revenue of £329.52 will be generated by 120 units as shown in yellow in screen shot.

Sales price is the promotional price of that product which for 1 kg own label carrot was £1 which was reduced from £1.50. Lost sales penalty is assigned based on the assumption that if the product is not sold during the weekly promotional period it will incur a penalty equal to the promotional price of the product (£1). Target ending stock is the stock level expected at the end of the promotional period. This is based on average sales achieved during promotional period minus the uplift achieved during the promotional period. In this case an uplift of forty percent is expected as seen from historical demand. Excess stock cost is the cost of product being wasted if not sold. Therefore, it's assigned the value equal to the promoted price. Carry over is the remaining stock level at the end of each promoted week. It is calculated based on the shelf life of the promoted product. In case of carrots it's ten days of shelf life, so only 30 percent of weekly stock is carried over to the next week.

Three important data sources were used for this model. This data relates to disaggregated shoppers demand at individual stores, promotional information about products and information about weather during promotional period as discussed in next section.

**5.5.2 Demand Data**

The demand data will be sourced from Dunnhumby Ltd. This database consists of retail sales data from a panel of 1.7 million UK supermarket shoppers and covers about 80% of total sales in Tesco stores across the UK. The Dunnhumby database provides two years of weekly supermarket transactions. Dunnhumby (2010) cites the Citigroup's independent research that stated that: 'As Tesco operates across all store formats, appeals to all consumer demographics, and reaches 40% of UK households, Club card data is representative of the UK shopper'.

Apart from the Dunnhumby data being representative of the UK shopper, it captures purchasing behaviour at a high level of disaggregation – individual products sold at individual stores and a variety of shopper groups (segmented by life stage, lifestyle, geo-demographics and TV advertising region). For the purpose of this research, weekly store sales will be analysed by customer penetration. Customer penetration is defined as the percentage of shoppers buying the product at least once in last 52 weeks (one year). Higher penetration stores will be grouped into third level of disaggregation (high penetration customer stores) whereas; lower penetration stores will fall into low penetration segment of stores. This segmentation will help us identify how price sensitive and upmarket stores react to different kinds of promotions on different kinds of products.

After accessing store level sales of two types of product (fresh vs. ambient), details about promotions for these products were also needed. Therefore another database of promotional history of these products was accessed as discussed in next section.

**5.5.3 Promotional Data**

In order to find promotional details of a product like type of promotional mechanic, date of promotion and depth of cut Brand View was used. This database tracks the promotional history of all products sold at major retailers by recording promotional mechanic, its product

category, promotional dates and retailer at which promotion was done. This greatly helped in selecting similar promotional mechanics among different product categories (fresh Vs ambient) at the same retailer (Tesco). Clarity in product and brand name in this database helped in relating it to similar products in Dunnhumby database. This comprehensive promotional database has huge potential for both suppliers & retailers during promotional cycle if used in synchronization with Dunnhumby database.

After obtaining both store level sales and promotional details, weekly weather detail was needed during promotional period. For this Met office website was consulted as discussed below.

### 5.5.4 Weather data

Information about the weather during that promotional period was collected from the Met office website. Minimum and maximum temperatures were noted for each day and overall conditions (dry or rainy) were also collected. In order to declare each week either dry or rainy, weather of majority of days in that week were considered. If more than 3 days of the week were rainy days, then that week was declared as rainy week. Same was true for the dry week.

These simulated outputs in the form of net revenue and delivery levels for each store will be fed into one of the four optimization models as discussed below.

## 5.6 Optimization model

In order to allocate optimum stock during promotional cycle based on simulated model, an optimization model was designed. This aim of this model was to maximize the net revenue during the promotional cycle by optimizing the stock allocation to different types of stores (extra, superstore, metro) keeping in view simulated demand of two types of shoppers (upmarket, price sensitive) in two types of weather conditions (rainy, dry). It was done with mix integer linear programming (MILP) using Knapsack problem technique. For this a solver (CPLEX) was added into the Excel as an add one. Optimization Model specifications are as follows.

$$X_{ij} = \begin{cases} 1 & \text{if deliver at level } \mathbf{i} \text{ to store type } \mathbf{j} \\ 0 & \text{other wise} \end{cases}$$

$V_{ij}$: Value (net revenue) of delivering at level $i$ to store type $j$

$n_j$:  Number of stores with type $j$ in the distribution network

$b$: Total stock level in the distribution centre

$d_{ij}$: Delivery amount for the delivery level $i$ for store type $j$

**Maximize**   $\sum_j \sum_i n_j V_{ij} X_{ij}$

Subject to:

$\sum_i X_{ij} = 1$ for any $j$

$$\sum_j \sum_i n_i \; d_{ij} X_{ij} \leq b$$

$X_{ij} \in \{0,1\}$

Optimization model seeks to maximize the total net revenue of the all store types j in that distribution network such that total delivery to the distribution network is less then total stock level (b) and delivery must be done to each store type j.

For the purpose of this research a total of four optimization models will be designed based on differences in type of product (Fresh Vs Ambient) and brand ownership(own label vs. brand label). Four optimizations and different sets of simulations (based on varying level of disaggregation) are designed to validate the research framework and propositions as shown in screen shot below.

Excel window title: oliveoiloptimization - Microsoft Excel

Formula bar: E12 =E11*E8

|  | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Stock level (b): | 1,900 | | | | | | | | | | | | |
| 2 | Total delivery: | 1,894 | | | | | | | | | | | | |
| 3 | Objective: | £10,564.73 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | |
| 5 | Type (j): | 1 | | | 2 | | | 3 | | | 4 | | | |
| 6 | Market: | Upmarket | | | Upmarket | | | Price Sens | | | Price Sens | | | |
| 7 | Store: | Extra | | | Super | | | Extra | | | Super | | | |
| 8 | Stores (n): | 31 | | | 40 | | | 31 | | | 42 | | | |
| 9 | Delivery per store: | 15 | | | 12 | | | 13 | | | 13 | | | |
| 10 | Total delivery: | 465 | | | 480 | | | 403 | | | 546 | | | |
| 11 | Revenue per store: | £84.64 | | | £59.67 | | | £77.89 | | | £74.75 | | | |
| 12 | Total revenue: | £2,623.84 | | | £2,386.80 | | | £2,414.59 | | | £3,139.50 | | | |
| 13 | | | | | | | | | | | | | | |
| 14 | | | level (d) | value (v) | order (x) | level (d) | value (v) | order (x) | level (d) | value (v) | order (x) | level (d) | value (v) | order (x) |
| 15 | | | 1 | -£112.68 | 0 | 1 | -£103.71 | 0 | 1 | -£96.07 | 0 | 1 | -£100.32 | 0 |
| 16 | | | 2 | -£97.68 | 0 | 2 | -£88.71 | 0 | 2 | -£81.07 | 0 | 2 | -£85.32 | 0 |
| 17 | | | 3 | -£82.68 | 0 | 3 | -£73.71 | 0 | 3 | -£66.07 | 0 | 3 | -£70.32 | 0 |
| 18 | | | 4 | -£67.68 | 0 | 4 | -£58.71 | 0 | 4 | -£51.07 | 0 | 4 | -£55.32 | 0 |
| 19 | | | 5 | -£52.68 | 0 | 5 | -£43.71 | 0 | 5 | -£36.07 | 0 | 5 | -£40.32 | 0 |
| 20 | | | 6 | -£37.68 | 0 | 6 | -£28.71 | 0 | 6 | -£21.07 | 0 | 6 | -£25.32 | 0 |
| 21 | | | 7 | -£22.68 | 0 | 7 | -£13.71 | 0 | 7 | -£6.07 | 0 | 7 | -£10.32 | 0 |
| 22 | | | 8 | -£7.68 | 0 | 8 | £1.29 | 0 | 8 | £8.93 | 0 | 8 | £4.68 | 0 |
| 23 | | | 9 | £7.32 | 0 | 9 | £16.29 | 0 | 9 | £23.93 | 0 | 9 | £19.68 | 0 |
| 24 | | | 10 | £22.32 | 0 | 10 | £31.29 | 0 | 10 | £38.93 | 0 | 10 | £34.68 | 0 |
| 25 | | | 11 | £37.04 | 0 | 11 | £45.92 | 0 | 11 | £53.48 | 0 | 11 | £49.30 | 0 |

**Figure 5.4:** Screen shot of a typical optimization model of olive oil

As shown in the figure 5.4 four different simulation scenarios (upmarket extra, upmarket supermarket, price sensitive extra, price sensitive supermarket) from olive oil are fed into the optimization model. Aim of the optimization model is to maximize total net revenue keeping in view certain stock level. Figure 5.4 also shows the individual delivery amount to each type of store for example, extra store in upmarket area will receive 15 units of olive oil and there are 31 stores in that category making a total of 465 units to that category of stores. These 465 units of olive oil will result into total revenue for that category of £2,623. Similarly, all these revenues will summed into total net revenue of £10,564 for a total delivery amount of 1,894 units against a stock level of 1,900 for that promoted product (olive oil).

After reporting about the revised research framework based on insights from literature review and stakeholder's interview, next section will present the results of simulation and optimization model to show that customising sales promotions will greatly improve the promotional performance.

# Chapter 6-Results

## 6.1 Introduction

Focus of the analysis will be to show that allocating right amount of stock based on accurate consumer demand will increase the total net revenues for the promoted product. Promotions from four different products (carrots, mango, olive oil, sunflower oil) were selected to represent two product categories (fresh produce & ambient) which belong to two types of brands (own label & brand label). This section is divided into four sub-sections each presenting results from one product.

## 6.2 Fresh produce category

Fresh produce category is represented by carrots and mango in this research. Fresh produce products are distinct from ambient due to their shorter shelf life, impact of weather on demand and supply and so more responsive promotional planning and execution. Next section will discuss results of carrots.

### 6.2.1 Carrots

One kg own label carrot was selected along with the mango to represent own label fresh produce category. It was promoted for six weeks (16/12/13 to 26/1/14) for 20 percent off across most of the Tesco stores. As this is an everyday high penetration product, therefore consumer demand was observed at three distinct level of disaggregation as shown in the table below. Table 6.11 also shows breakdown of total number of stores (by shopper type, store format, level of customer penetration) where 1 kg carrot is sold.

| Type of shoppers | UP market (56) | | | | | | Price sensitive (56) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of store format | Extra (22) | | Supermarket (23) | | Metro (11) | | Extra (17) | | Supermarket (27) | | Metro (12) | |
| Level of customer penetration | High (17) | Low (5) | High (18) | Low (5) | High (6) | Low (5) | High (7) | Low (10) | High (6) | Low (21) | High (7) | Low (5) |

**Table 6.1:** Three levels of disaggregated demand

Three level of disaggregation (by shopper type, store type & penetration level) shown in table above will result into twelve promotional scenarios for analysis. These scenarios are as follows 1)upmarket extra high customer penetration 2)upmarket extra low customer penetration 3) upmarket supermarket high customer penetration 4)upmarket supermarket low customer penetration 5)upmarket metro high customer penetration 6)upmarket metro low customer penetration 7)price sensitive extra high penetration 8)price sensitive extra low penetration 9)price sensitive supermarket high penetration 10)price sensitive supermarket low penetration 11)price sensitive metro high penetration 12)price sensitive metro low penetration.

It is also evident from table 6.1 that total numbers of stores for each category of customers (upmarket vs. price sensitive) are same (56). These stores numbers vary slightly as they are further subdivided into different store formats. For example, out of 56 stores in upmarket customer section majority are in supermarket format (23). Similar trend is observed in price sensitive stores but total number of stores in supermarket formats here is comparatively greater (27).

In order to validate the propositions of using different levels of disaggregation, non-parametric tests will be performed at each level. Non-parametric tests are particularly useful in these promotional scenarios as no prior assumption about the probability density function of demand can be made (Anderson et al., 2009). The rationale for using different types of customers for twelve promotional scenarios was checked by a Wilcoxon signed rank test. This is the non-parametric test which is used for paired or matched sample

observations. The significance of using stores with different types of customers based on their socio-economic factors was checked by this test.

Keeping weather (rainy), store format and customer penetration (high) constants and changing the customer type (price sensitive vs. upmarket) for 1 kg own label(Tesco) carrot on 20 percent off promotion resulted in following(table 7.2). It shows significance levels along with the test statistics of the non-parametric test (Wilcoxon signed test).

|  |  | Price sensitive | | |
|---|---|---|---|---|
|  |  | Extra | Supermarket | Metro |
| Upmarket | Extra | Z= -4.112[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .000 |  |  |
|  | Supermarket |  | Z= -2.756[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .006 |  |
|  | Metro |  |  | Z= -1.863[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .062 |

b. Based on positive ranks

**Table 6.2:** Wilcoxon signed test two different types of customers with similar format & weather

It is evident from the table above that consumer demand of upmarket and price sensitive customers are statistically significant despite having similar store sizes, customer penetration levels and weather conditions.

After validating the use of different customer segments based on socio-economic conditions, another non-parametric test was performed to verify the propositions that

observing consumer demands at three different store formats are statistically significant. For this purpose consumer demand of an upmarket customer of 1 kg own label carrot on 20 percent off promotion in rainy weather with high customer penetration was compared at three different store formats (extra, supermarket, metro) as shown in table 6.3.

| | Extra | Supermarket | Metro |
|---|---|---|---|
| **Extra** | | Z= -6.996[b] <br><br> Asymp. Sig <br><br> (2-tailed) = .000 | |
| **Supermarket** | | | Z= -4.711[b] <br><br> Asymp. Sig <br><br> (2-tailed) = .000 |
| **Metro** | Z= -4.762[b] <br><br> Asymp. Sig <br><br> (2-tailed) = .000 | | |

b. Based on positive ranks

**Table 6.3:** Wilcoxon signed test demand of 1 kg carrot in different store formats

As shown in the table 3 that consumer demand at three different types of store formats are statistically significant if we keep other factors constant (type of customer, penetration levels and weather conditions). This validate the use of second level of disaggregation (different store formats) for this research to observe the promotional cycle of a one kg own label carrot.

The third level of disaggregation was at customer penetration level (high vs. low customer penetration). In order to validate the use of two different type of customer penetration, a non-parametric test was applied on an upmarket consumer of 1 kg carrot in a rainy weather across three different store formats (extra, supermarket, metro)with two different levels of

customer penetrations (high vs. low). The results are shown along with the test statistics in table 6.4 below.

| Store format | **Extra** | **Supermarket** | **Metro** |
|---|---|---|---|
| Customer penetration | **High vs. Low** | | |
| | Z=-4.206[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .000 | Z=-3.894[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .000 | Z=-4.373[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .000 |

b. Based on positive ranks

**Table 6.4:** Wilcoxon signed test two types of customer penetration levels with similar store format.

It is evident from the table 6.4 that using different levels of customer penetration with similar customer type, weather condition and store format is statistically significant. This validates the use of two different types of customer penetrations levels for this research.

Weather was identified as an important factor affecting the promotional cycle during suppliers interviews and literature review especially for fresh produce products. In order to see the significance of weather on promotional cycle, two types of weekly weather conditions (dry vs. rainy) were taken into account. A non-parametric test was performed to test the significance of considering weather for these promotional scenarios. Results along with the test statistics are shown in table 6.5 below.

| Customer type | Price sensitive | | | Upmarket | | |
|---|---|---|---|---|---|---|
| Store format | *Metro* | *Supermarket* | *Extra* | *Metro* | *Supermarket* | *Extra* |
| Weather | *Dry Vs. Rainy* | | | *Dry Vs. Rainy* | | |
| | Z=-1.886[b] Asymp. Sig (2-tailed) = .000 | Z=-3.715[b] Asymp. Sig (2-tailed) = .000 | Z=-3.479[b] Asymp. Sig (2-tailed) = .000 | Z=-2.629[b] Asymp. Sig (2-tailed) = .000 | Z=-3.803[b] Asymp. Sig (2-tailed) = .000 | Z=-4.010[b] Asymp. Sig (2-tailed) = .000 |

**Table 6.5:** Wilcoxon signed test two types of weather conditions (dry vs. rainy) for twelve promotional scenarios.

As the results of a non-parametric test in table 6.5 shows that weather has a significant impact on the demand of carrots in three different store formats (extra, supermarket, metro) with two different types of customers(price sensitive vs. upmarket).

After testing all the simulation model inputs like type of customers, type of store format, level of customer penetration and weather conditions for significance table 6.6 shows the probability distribution functions of all twelve promotional scenarios. These functions were selected based on AIC (akaike information criteria) ranking. This gives the estimate of the information loss of a model that represents certain process. These are those processes which generates the data. It is considered as a trade-off between goodness of fit process and complexity of model (Burnham & Anderson, 2002).

| Type of customer | | Up market | | | | | | Price sensitive | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Store format | | *Metro* | | *Supermarket* | | *Extra* | | *Metro* | | *Supermarket* | | *Extra* | |
| Customer penetration | | *High* | *low* | *high* | *low* | *high* | *low* | *high* | *low* | *high* | *low* | *high* | *low* |
| weather | **Rainy** | Normal μ=171 σ=70 | Uniform min=17 max=72 | Triang min=300 mode=300 max= 1403 | Triang min=-11 mode=130 max=659 | Uniform min=394 max=1915 | Weibull α=1.3 β=493 | Triang min=-1 mode=110 max=703 | Normal μ=50 σ=22 | Gamma α=2 β=183 | Normal μ=492 σ=231 | Normal μ=1349, β=415 | Uniform min=541 max=1418 |
| | **Dry** | Uniform min=50 max=290 | Expon β=26 | Expon β=320 | Gamma α=3 β=85 | Normal μ=867 σ=326 | Uniform min= 121 max= 768 | Expon β= 70 | Uniform min=0 max=60 | Triang min= 480 mode =480 max= 1523 | Normal μ=342 σ=90 | Triang min=452 mode= 1410 max= 1410 | Uniform min=610 max= 1090 |

**Table 6.6:** Probability density functions of twelve promotional scenarios

It is clear from the table above that consumer demand at each of the twelve promotional scenarios follows a different probability density function due to variation in customer type, store type, penetration levels and weather conditions. Even if the demand follows a similar probability density function for two different promotional scenarios the value of that function varies. For example as shown in table 6.6, price sensitive customers shopping at supermarket with high and low customer penetration levels in rainy weather have similar probability function (triangular) but values of these functions for these two scenarios vary significantly.

After inputting different probability density functions of demand for all twelve promotional scenarios, outputs in the form of range of net revenues were calculated from simulation models. These net revenues were fed into optimization model to find the total net revenues for a product against a range of delivery amounts.

We will compare the optimized outputs with different stock allocation scenarios as shown in figure 6.3 below. It is evident that total net revenue generated from optimized model based on disaggregated demand is higher than stock allocation scenario based on historical demand as plan by either retailers or suppliers. This graph proves the basic principal of this research that stock allocation based on disaggregated demand will result into improved promotional performance measured in net revenue as compared to stock allocation based only on previous historical demand.
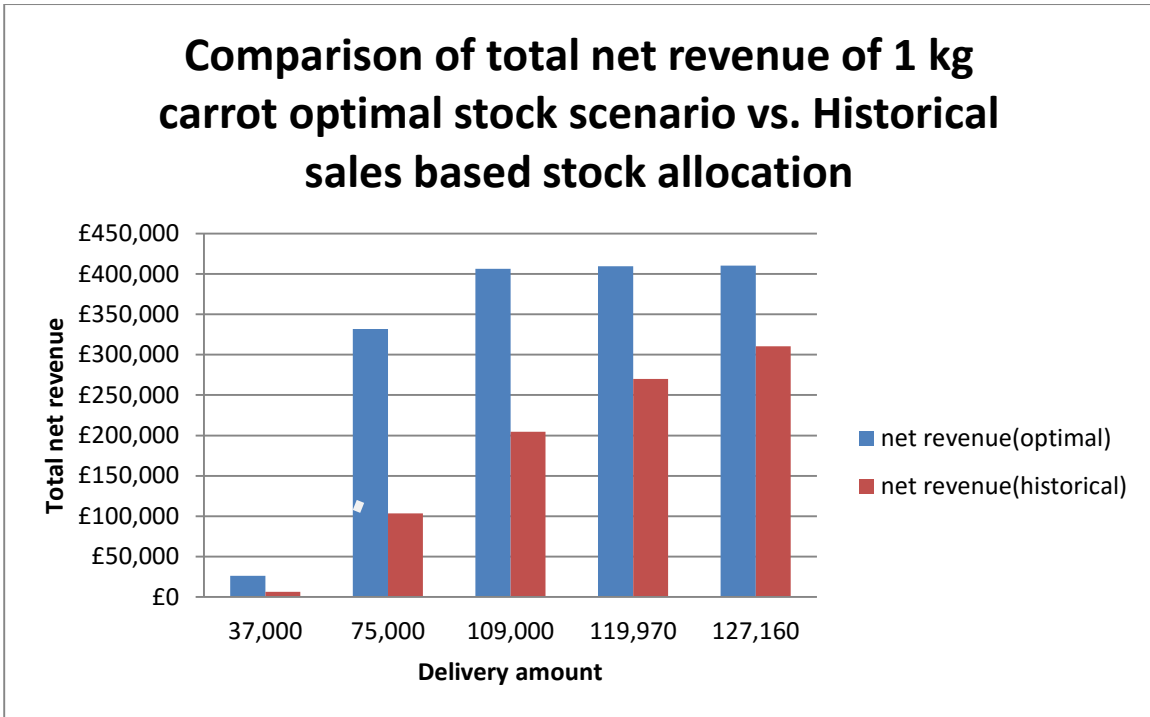
**Figure 6.3:** Comparison of total net revenue of optimized stock allocation based on disaggregated demand with stock allocation based on previous historical demand.

It is clear from the above graph that customising sales promotions will improve the total net revenue. This should act as an incentive for all the stakeholders in the promotional cycle to incorporate detail consumer information in their planning process so that they can earn more and waste less.

After discussing the results of one of fresh produce product with three levels of disaggregation, I will discuss the results of another own label fresh produce product (mango) which was promoted for four weeks (3/6/13 to 30/6/13) with a similar promotional mechanic (50p off).

### 6.2.2 Mango

This promoted product belongs to the fruit category of the fresh produce and selected due to its distinct variation in demand from carrot and ambient category products. It was low penetration product so consumer demand was observed at two levels of disaggregation instead of three as done earlier in carrots as shown below in table 6.7. It also shows total number of stores at each level of disaggregation.

| Type of shoppers | UP market (83) | | | Price sensitive (96) | | |
|---|---|---|---|---|---|---|
| Type of store format | Extra (30) | Supermarket (31) | Metro (22) | Extra (43) | Supermarket (41) | Metro (12) |

**Table 6.7:** Two levels of disaggregated demand for own label mango

These two levels of disaggregation (by shopper type, store type) will result into six promotional scenarios. These six promotional scenarios are 1)upmarket extra 2) upmarket supermarket 3)upmarket metro 4)price sensitive extra 5)price sensitive supermarket 6)price sensitive metro. Total numbers of stores in each category (upmarket vs. price sensitive) are comparable with majority of stores in extra (30+43) and supermarket (31+41) store formats as shown in table 6.7.

Interestingly weather has shown to have no impact on the consumer demand for any of these six promotional scenarios (as shown below in table 8 along with the test statistics). As shown from table 6.8 below weather was non-significant across all three store formats (extra, supermarket, metro) and two customer types (price sensitive, upmarket).

| Customer type | Price sensitive | | | Upmarket | | |
|---|---|---|---|---|---|---|
| Store format | *Metro* | *Supermarket* | *Extra* | *Metro* | *Supermarket* | *Extra* |
| Weather | *Dry Vs. Rainy* | | | *Dry Vs. Rainy* | | |
| | Z=-.949[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .343 | Z=.343<br><br>Asymp. Sig<br><br>(2-tailed) =<br>.162 | Z=-.789[b]<br><br>Asymp. Sig<br><br>(2-tailed) =<br>.430 | Z=-.430[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .66 | Z=-.505[b]<br><br>Asymp. Sig<br><br>(2-tailed) =<br>.614 | Z=-.505[b]<br><br>Asymp. Sig<br><br>(2-tailed) =<br>.614 |

b. Based on positive ranks

**Table 6.8:** Wilcoxon signed test two types of weather conditions (dry vs. rainy) for six promotional scenarios.

This shows that even in fresh produce category (carrot vs. mango) weather impacts demand differently at all levels of disaggregation. Therefore, promotional planning and execution has to take into account these situational factors along with weather to decide about stock allocation during promotional cycle.

Wilcoxon signed rank test was used to validate the first level of disaggregation that is to show that consumer demand disaggregated by socio-economical factor are statistically significant. For this purpose consumer demand was tested across both customer types (price sensitive vs. upmarket) as shown in table 6.9 below.

|  |  | Price sensitive | | |
| --- | --- | --- | --- | --- |
|  |  | **Extra** | **Supermarket** | **Metro** |
| **Upmarket** | **Extra** | Z= -6.473[b] Asymp. Sig (2-tailed) = .000 |  |  |
|  | **Supermarket** |  | Z= -4.001[b] Asymp. Sig (2-tailed) = .000 |  |
|  | **Metro** |  |  | Z= -3.759[b] Asymp. Sig (2-tailed) = .000 |

b. Based on positive ranks

**Table 6.9:** Wilcoxon signed test consumer demand for own label mango in different store formats.

As shown in table 6.9 consumer demand at all three store formats (extra, supermarket, metro) for two different types of customers is statistically different. This validates the use of two different types of consumers.

After validating the first level of disaggregation by type of customer, another non parametric test is performed to check the significance of using consumer demand at three different store formats. Wilcoxcon signed test was applied on upmarket customers across three different store formats as shown in table 6.10 below.

| Upmarket | Extra | Supermarket | Metro |
|---|---|---|---|
| Extra | | Z= -4.223[b] <br><br> Asymp. Sig <br><br> (2-tailed) = .000 | |
| Supermarket | | | Z= -6.513[b] <br><br> Asymp. Sig <br><br> (2-tailed) = .000 |
| Metro | Z= -7.753[b] <br><br> Asymp. Sig <br><br> (2-tailed) = .000 | | |

b. Based on positive ranks

**Table 6.10:** Wilcoxon signed test consumer demand for own label mango at different store formats keeping similar customer type.

It is evident from table above that disaggregating consumer demand by these three store format levels is statistically significant. This validates the use of second level of disaggregation for this fresh produce product in this research.

After validating the inputs for the simulation model of own label mango during four week promotional cycle total net revenues from optimization model were compared to see the difference from total net revenues based on promotional planning of historical sales demand as currently practiced by retailers and suppliers.
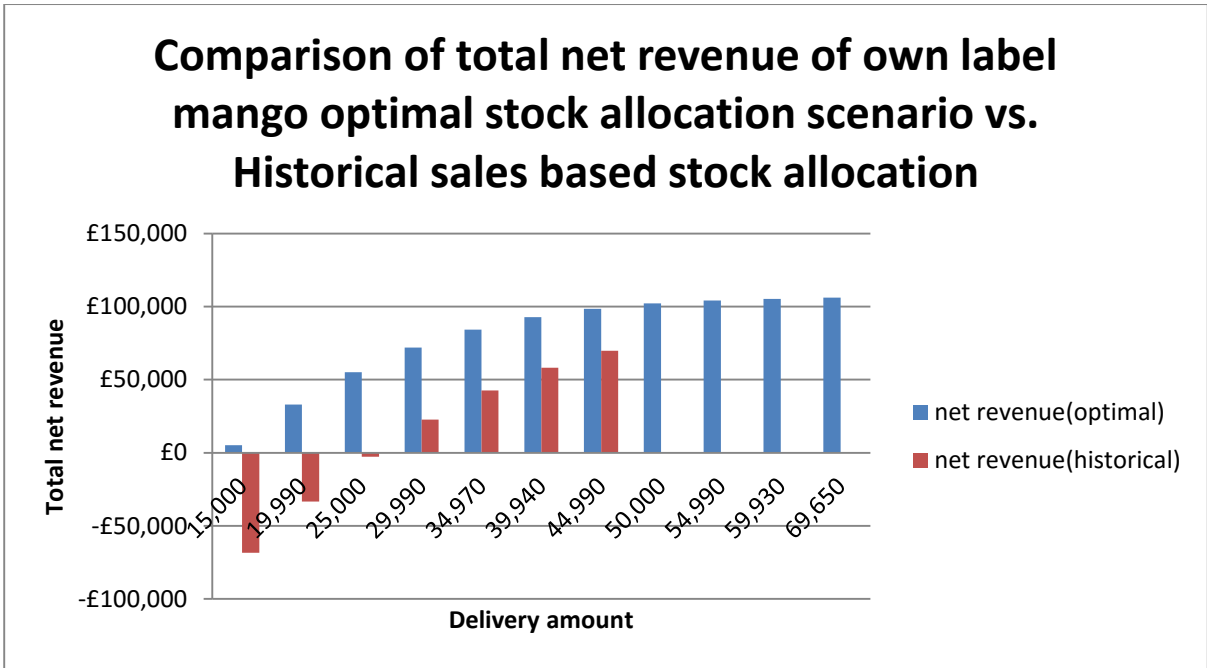
**Figure 6.4:** Comparison of total net revenue of optimized stock allocation of own label mango based on disaggregated demand with stock allocation based on previous historical demand.

It is evident from the figure above that allocating stock based on disaggregated consumer demand will improve the total net revenue of an own label mango as compared to stock allocation decisions based on historical demand of promoted product.

After discussing the results of fresh produce category, next section will present the results of ambient category of promoted product (olive oil & sunflower oil).

## 6.3 Ambient category

Two types of brand label cooking oils (olive oil & sunflower oil) were selected from this category to show the differences in demand from fresh produce and also to compare brand label ambient products with own label fresh produce. First in ambient category is sunflower oil whose results are shown below.

### 6.3.1 Sunflower oil

Sunflower is an ambient product with longer shelf life and as it was a brand label product therefore it has a low customer penetration. Therefore, one litre brand label (Flora)

sunflower oil demand for four weeks (30/1/13 to 26/2/13) was observed at two levels of disaggregation as shown in table 6.11 below. Total number of stores at each level of disaggregation is also shown in table 6.11.

| Type of shoppers | UP market (149) | | | Price sensitive (160) | | |
|---|---|---|---|---|---|---|
| Type of store format | Extra (70) | Supermarket (51) | Metro (28) | Extra (64) | Supermarket (66) | Metro (30) |

**Table 6.11:** Two levels of disaggregated demand for 1L sunflower oil during promotions

These two levels of disaggregation (by shopper type, store type) will result into six promotional scenarios. These six promotional scenarios are 1)upmarket extra 2) upmarket supermarket 3)upmarket metro 4)price sensitive extra 5)price sensitive supermarket 6)price sensitive metro. As seen from table 11 majority of stores are in extra and supermarket formats from both types of customers (upmarket & price sensitive).

In order to validate the first level of demand disaggregation (by customer type) we will apply non-parametric test on both types of customer. Therefore wilcoxon signed test was applied on the demands of all three store formats of these two types of customers in rainy weather. The results are shown in table 6.12 below.

|  |  | Price sensitive | | |
|  |  | Extra | Supermarket | Metro |
| **Upmarket** | **Extra** | Z= -4.298[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .012 |  |  |
|  | **Supermarket** |  | Z= -2.500[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .000 |  |
|  | **Metro** |  |  | Z= -2.500[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .916 |

**Table 6.12:** Wilcoxon signed test to show comparison of consumer demand of brand label 1L sunflower oil at three different store formats.

It is clear from table above that consumer demand of 1 litre of brand label sunflower oil is significantly different for upmarket and price sensitive customers in two larger store formats (extra, supermarket) but not significant at lower store formats (metro).

After validating the use of two types of customers for sunflower oil, another non-parametric test was applied to check the significance of using three different types of store formats. For this purpose Wilcoxon signed ranked test was applied on an upmarket customer during the rainy weather across all three store formats as shown in table 6.13 below.

| Up market | Extra | Supermarket | Metro |
|---|---|---|---|
| Extra | | | Z= -4.366[b] Asymp. Sig (2-tailed) = .000 |
| Supermarket | Z= -3.259[b] Asymp. Sig (2-tailed) = .001 | | |
| Metro | | Z= -3.620[b] Asymp. Sig (2-tailed) = .000 | |

b. Based on positive ranks

**Table 6.13:** Wilcoxon signed rank test consumer demand of brand label sunflower oil at different store formats amongst supermarket shoppers

Results in table 6.13 validate the use of second level of customer disaggregation (by store type). In order to check the significance of using two different weather conditions (dry vs. rainy) for 1 litre sunflower oil another non parametric test was applied. Results along with the test statistics are shown in table 6.14 below.

| Customer type | Price sensitive | | | Upmarket | | |
|---|---|---|---|---|---|---|
| Store format | *Metro* | *Supermarket* | *Extra* | *Metro* | *Supermarket* | *Extra* |
| Weather | Dry Vs. Rainy | | | Dry Vs. Rainy | | |
| | $Z= -2.352^b$ Asymp. Sig (2-tailed) = .019 | $Z= -3.402^b$ Asymp. Sig (2-tailed)= .001 | $Z= -5.084^b$ Asymp. Sig (2-tailed)= .000 | $Z= -1.617^b$ Asymp. Sig (2-tailed) = .106 | $Z= -3.425^b$ Asymp. Sig (2-tailed)= .001 | $Z= -2.351^b$ Asymp. Sig (2-tailed)= .019 |

b= Based on positive ranks

**Table 6.14:** Wilcoxon signed rank test two types of weather conditions (dry vs. rainy) for six promotional scenarios

It is clear that weather has a significant impact on the demand at most of store formats across both customer types with the exception of upmarket customers in metro store formats.

After validating all inputs to the simulation model a line graph was plotted based on outputs of simulation model into optimization model to see the optimal net revenues. These optimal revenues were compared with the net revenues of stock allocation based on historical demands as currently practiced in figure 6.5 below.
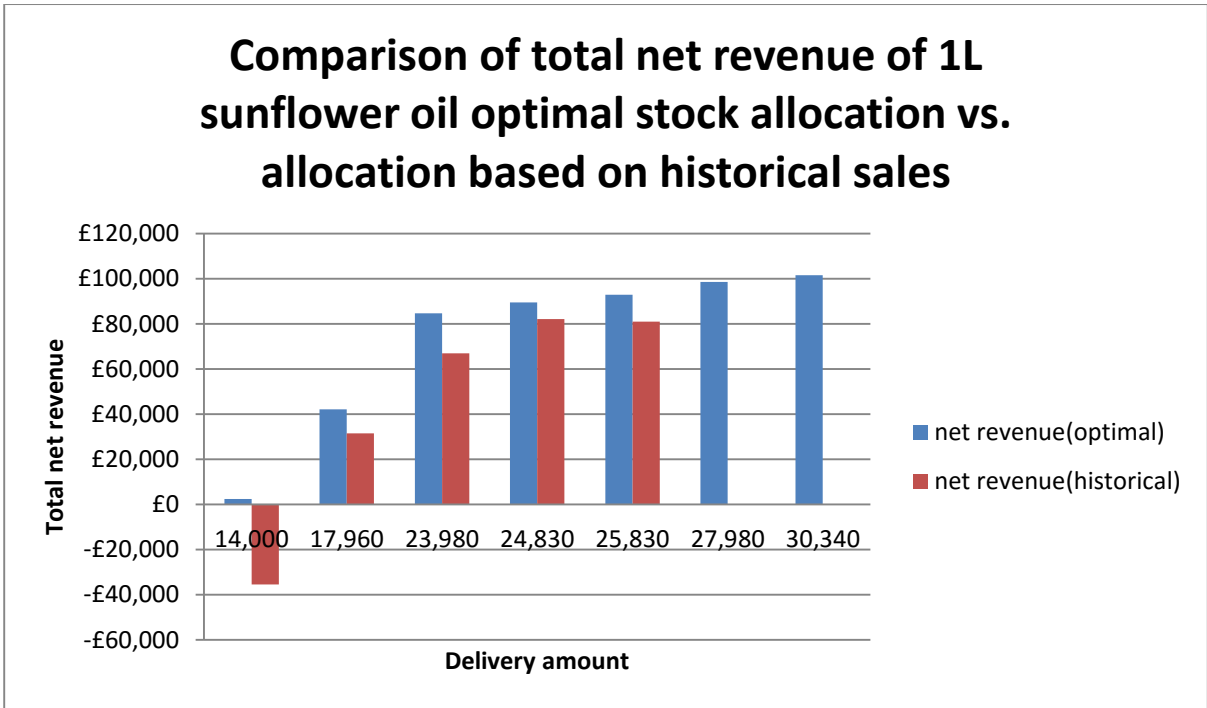
**Figure 6.5:** Comparison of total net revenue of optimized stock allocation of 1 litre brand label sunflower oil based on disaggregated demand with stock allocation based on previous historical demand.

It is evident from graph above that total net revenue is greater if we allocate stock based on disaggregated consumer demand instead of historical demand from previous years.

After discussing the results of sunflower oil of ambient product category, next section will discuss the results of the 250 ml olive oil from brand label which was on promotion for five weeks (21/8/12 to 25/9/12) for 49p off.

**6.3.2 Olive oil**

Market share of olive oil category is highly competitive and many brands are trying to increase their customer base. This brand label 250 ml olive oil promoted product was found to be sold only on extra and supermarket store formats. It also enjoys the lowest customer penetration as compared to other three promoted products (carrots, mango & sunflower oil) discussed earlier. Therefore, consumer demand was observed at two levels of disaggregation with only two store formats along with the number of stores as shown in table 7.15 below.

| Type of shoppers | UP market (71) | | Price sensitive (73) | |
|---|---|---|---|---|
| Type of store format | Extra (31) | Supermarket (40) | Extra (31) | Supermarket (42) |

**Table 6.15:** Two levels of disaggregated demand for 250 ml olive oil across two types of store formats

It is evident from table 6.15 that the numbers of stores in each store format from two different customer types (price sensitive vs. upmarket) are same. This will result into only four promotional scenarios. These are as 1) upmarket extra 2) upmarket supermarket 3) price sensitive extra 4) price sensitive supermarket.

With very low level of customer penetration, this product was also not influenced by weather as shown in table 6.16 below.

| Customer type | *Price sensitive* | | *Upmarket* | |
|---|---|---|---|---|
| Store format | *Supermarket* | *Extra* | *Supermarket* | *Extra* |
| Weather | *Dry Vs. Rainy* | | *Dry Vs. Rainy* | |
| | Z=-1.634[b] Asymp. Sig (2-tailed) = .102 | Z=-.389[b] Asymp. Sig (2-tailed) = .697 | Z=-.620[b] Asymp. Sig (2-tailed) = .535 | Z=-1.170[b] Asymp. Sig (2-tailed) = .242 |

b. Based on positive ranks

**Table 6.16:** Wilcoxon signed rank test two types of weather conditions (dry vs. rainy) for six promotional scenarios.

It is evident from the results of the non parametric test above that weather has a non significant effect on the demand of 250 ml of brand label olive oil. Similarly, disaggregating by customer type was also non-significant as shown below in table 6.17.

| | Price sensitive | | |
|---|---|---|---|
| | | Extra | Supermarket |
| **Upmarket** | **Extra** | Z=-1.949[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .051 | |
| | **Supermarket** | | Z=-1.143[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .253 |

b. Based on positive ranks

**Table 6.17:** Wilcoxon signed rank test demand for brand label 250 ml olive oil in different store formats amongst upmarket shoppers

Similarly, disaggregating only by two store format is also non-significance as shown in table 7.18 below.

| *Up market* | Extra |
|---|---|
| **Supermarket** | Z= -1.949[b]<br><br>Asymp. Sig<br><br>(2-tailed) = .051 |

**Table 6.18:** Wilcoxon signed rank test to demand for branded 250ml olive oil in different store formats amongst upmarket shoppers

Despite having non-significance levels of customer types and store type, total net revenue is greater if we allocate stock based on disaggregated consumer demand instead of historical demand from previous years as shown in figure 6.6.
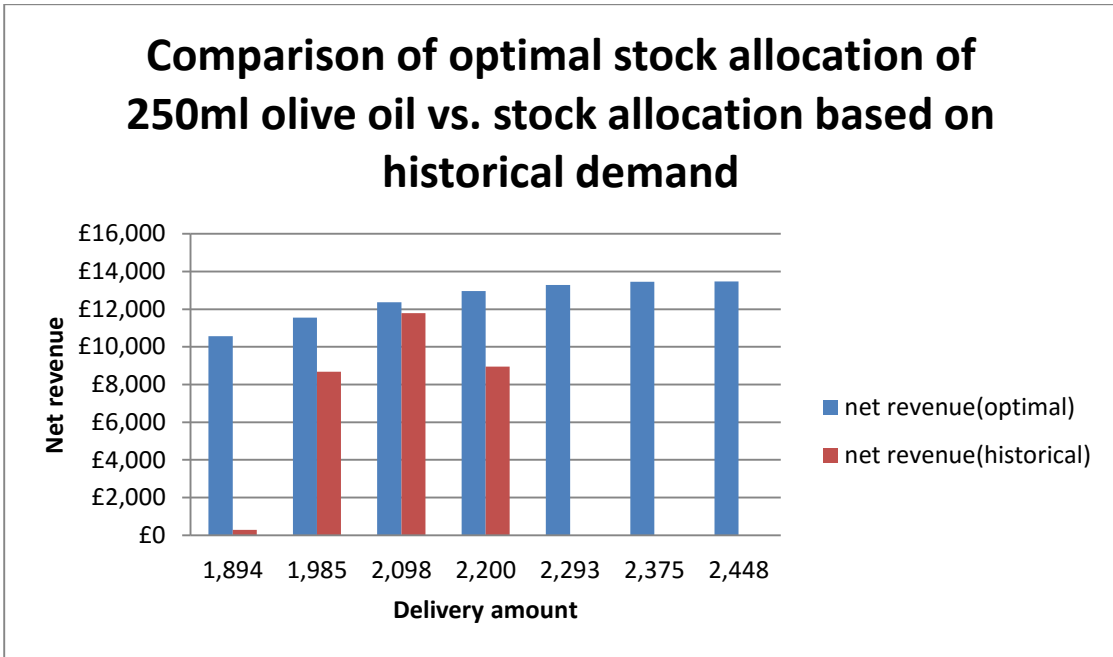
**Figure 6.6:** Comparison of total net revenue of optimized stock allocation of 250 ml brand label olive oil based on disaggregated demand with stock allocation based on previous historical demand.

## 6.4 Summary

The results obtained from the simulation modelling and optimsation provide support for the propositons that a) the impact of promotions vary according to the characteristics of the product, store and shopper segment, strength of demand and the weather conditions, and b) net sales revenue from promotional activity  can be increased through more effective demand foreacsting and stock allocations resulting from the use of dis-aggregated sales data. However, the extent to which these factors influence promotional outcomes also varies significantly, as shown in table 6.19.

| Type of Product | | Type of customer | | | Type of store format | | | Level of customer penetration | | | weather | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Upmarket Vs. Price sensitive | | | Extra Vs. Supermarket | Supermarket Vs. Metro | Metro Vs. Extra | High Vs. Low | | | Dry Vs. Rainy | | |
| | | Extra | Supermarket | Metro | | | | Extra | Supermarket | Metro | Extra | Supermarket | Metro |
| **Fresh produce** | Carrot | Z=-4.112$^{b**}$ | Z= -2.756$^{b*}$ | Z=-1.863$^{b}$ | Z= -6.996$^{b**}$ | Z= -4.711$^{b**}$ | Z= -4.762$^{b**}$ | Z=-4.206$^{b**}$ | Z=-3.894$^{b**}$ | Z=-4.373$^{b**}$ | Z=-1.886$^{b**}$ | Z=-3.715$^{b**}$ | Z=-3.479$^{b**}$ |
| | Mango | Z=-6.473$^{b**}$ | Z= -4.001$^{b**}$ | Z= -3.759$^{b**}$ | Z= -4.223$^{b**}$ | Z= -6.513$^{b**}$ | Z= -7.753$^{b**}$ | | | | Z=-789$^{b}$ | Z=.343 | Z=-.949$^{b}$ |
| **Ambient** | Sunflower oil | Z=-4.298$^{b}$ | Z= -2.500$^{b**}$ | Z= -2.500$^{b}$ | Z= -3.259$^{b**}$ | Z= -3.620$^{b**}$ | Z=-4.366$^{b**}$ | | | | Z=-5.084$^{b**}$ | Z= -3.402$^{b**}$ | Z= -2.352$^{b}$ |
| | Olive oil | Z=-1.949$^{b}$ | Z=-1.143$^{b}$ | | Z= -1.949$^{b}$ | | | | | | Z=-389$^{b}$ | Z=-1.634$^{b}$ | |

b. Based on positive ranks

**Significant at 1% level, * Significant at 5% level

**Table 6.19** Wilcoxon signed ranked test results along with test statistics for different levels of disaggregation

In the majority of cases, store format, customer type and penetration are important determinants of demand irrespective of product category with the certain exceptions like carrots in smaller store format (metro). Similarly, customer type is generally significant for fresh but not in ambient products (olive oil & sunflower oil). Store format is significant regardless of product class, the exception being olive oil. Weather is important for some products (carrots and sunflower oil) but not for others (mango and olive oil).

Results clearly make the case of observing the consumer demand at different types of customers, store formats and penetration levels but this has to be linked with the type of product being promoted along with its customer appeal and market share. Results also shows that impact of weather changes with the type of product promoted irrespective of which product category they belong.

The optimisation model generated consist results in terms of increased promotional uplifts using the dis-aggregated demand data for the store-level forecasts, as opposed to the historical (aggregate) sales data, which is the current practice. These impacts are illustrated in figure 6.7, which also highlights the heterogeneity of performance improvement across the different product categories. In particular, in case of fresh produce (carrot & mango) as the delivery amount increases so does the difference between the historical net revenue and optimal revenue.
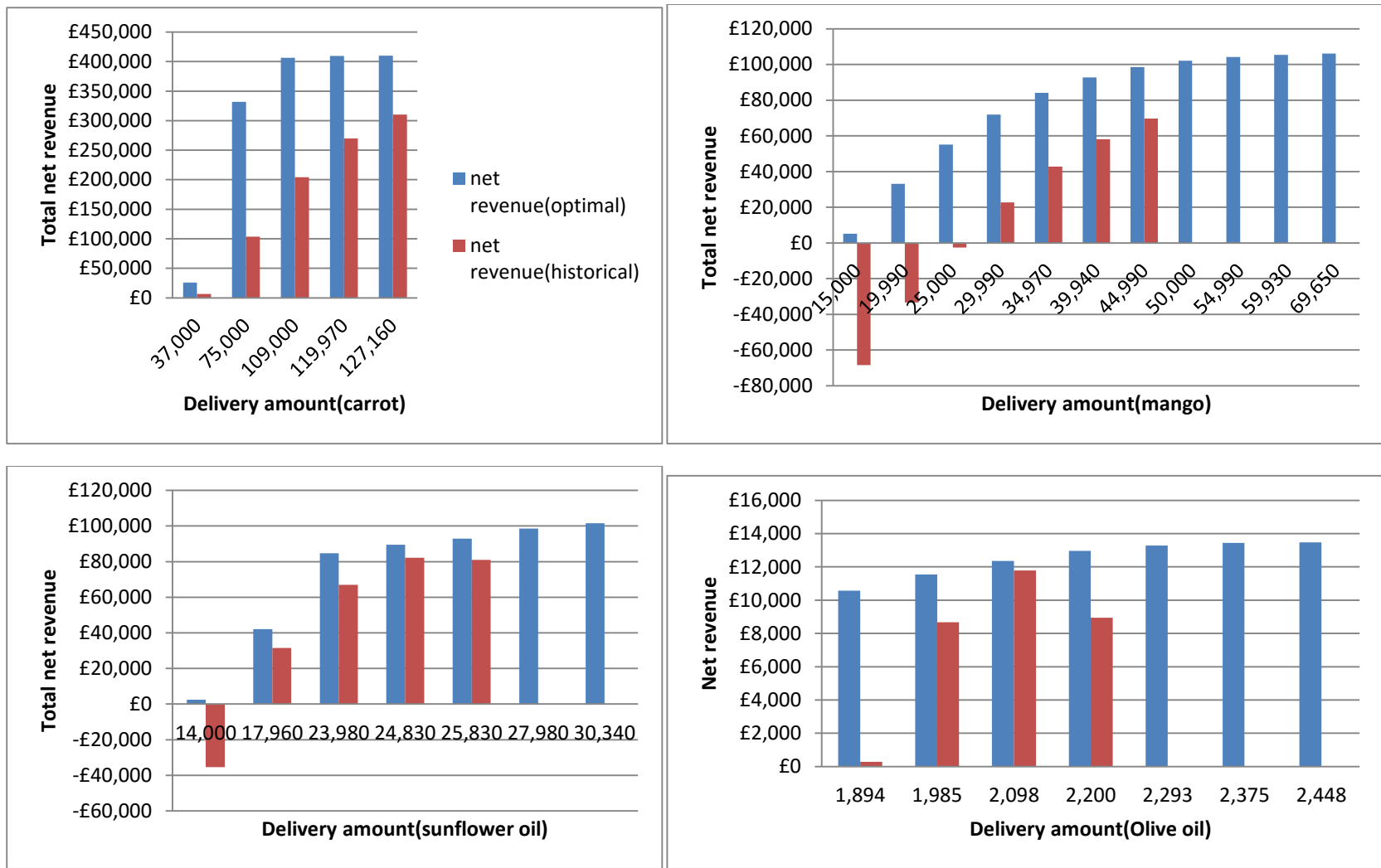
**Figure 6.7:** Comparison of total net revenue of optimized stock allocation of both fresh and ambient product categories based on disaggregated demand with stock allocation based on previous historical demand.

After presenting simulation and optimization results of both product categories (ambient vs. fresh produce), next chapter will discuss these results in detail and relate it with the research objectives.

# CHAPTER 7- DISCUSSION

## 7.1 Introduction

The aim of this research was to improve our understanding of promotional impacts and identify the (potential) benefits from using disaggregated sales data in demand forecasting and stock allocation decisions. Improving our understanding of the interaction between supply (stock allocation) and demand (store level sales forecasts) is important as inaccurate forecasts generated from aggregated sales data is believed to result in sub-optimal (Hawkes, 2009) and un-sustainable (Mantrala et al., 2009) promotional planning and execution.

The following discussion focuses on the two key elements of the research undertaken, namely:

1. The estimation of the impact of different factors on promotional effectiveness, as measured by the change in net revenues, for different products and a range of market scenarios; and

2. The development of a simulation and optimisation model to determine the potential benefit (increased net revenue) as a result of using dis-aggregated demand data for store-level demand forecasts and stock allocation/replenishment decisions.

The key findings from these two distinct elements of the research are discussed below.

## 7.2 Factors affecting promotional performance

The literature identified a number of factors that influence promotional impacts. These were explored in the executive interviews, resulting in four factors being explored in the context of this research: the weather, the type of customer, the type of product and the store format. In the following sub-sections the key findings for these four factors are discussed.

**7.2.1 Weather**

Weather was identified as an important factor influencing consumer behaviour, particularly during sales promotions for products with seasonal demand (Caliskan, 2013). The importance of the weather was also highlighted in the executive interviews, yet the literature review revealed a lack of attention given to this factor in research focussed on short term (weekly/daily) sales uplifts associated with promotional activity (Nikolopoulos and Fildes, 2013).

The estimated impacts of the weather on promotional uplifts were mixed. The impact on demand for carrots was identified as highly significant (as shown in table 6.5) but the demand for mangos was largely unaffected by the weather (as shown in table 6.8). Similarly, the impact on the two cooking oil brands was inconsistent. The sales of 1ltr sunflower oil were significantly impacted by the weather for most shopper segments and store formats (as shown in table 6.14). However, the demand for 250ml branded olive oil was unaffected by the weather (as shown in table 6.16).

These results indicate that weather can have a significant impact on demand but that this is dependent on the product characteristics. These results are consistent with the findings of Srinivasan et al. (1998), who identified the limitations of assessing promotional impacts for highly aggregated product categories – carrots and mangoes are both from the fresh produce category but the impact of promotions and the moderating role of the weather are distinctly different.

**7.2.2 Customer Segments**

Previous researchers have highlighted the importance of targeting distinct customer segments when designing promotional strategies (Hsu et al. (2012). The results of this study provide further evidence to support this view. For both product categories (fresh & ambient) the promotional impacts were significantly different for the different socio-economic segments (Up-market and price sensitive) and the results for fresh carrots show that consumers who are more interested in the product (high product penetration) are

much more likely to respond to promotions than consumers who have limited interest (low product penetration).

These results are important in their own right, as they provide empirical evidence of the heterogeneity of consumer demand and promotional impacts across different consumer segments. In addition, they constitute a distinguishing feature of the simulation and optimisation models, enabling the modelling to reflect more accurately the dynamics of the promotional cycle as it happens, as opposed to what we assume. This is a weakness in the extant literature that has been highlighted by previous researchers. For example, the over-simplification of theoretical models was identified by Raju (1995). Using customer segmentations that are consistent with commercial practice facilitates more accurate forecasts of promotional uplifts at store level and establish the scope for improvement based on disaggregated sales data that is available to the retail buyer and the supply base.

The improvement in forecast accuracy resulting from the use of dis-aggregate sales data is especially important for small food suppliers, for whom small improvements in promotional uplifts can have a significant impact on the profitability of promotional activities.

As with the weather, the results from this study clearly show that promotional impacts on distinct customer segments are not consistent across all segments, store formats or product types. Sales uplifts by shopper segment were significantly different for the fresh produce category but not for all of the ambient products. For example, the promotional impacts were distinctly different for sunflower oil but not for olive oil. There could be several reasons for this, including higher levels of brand loyalty in the olive oil category, which is a more mature category than sunflower.

Angell et al. (2012) highlighted the limited evidence of promotional impacts across different shopper segments, particularly in the UK, as most of the published segmentation studies are based on US data. The results of this study go some way to addressing this gap in the empirical literature, using one of the richest data sources in the UK.

**7.2.3 Type of Product**

Significant differences were observed in the response of consumers to promotions within and between the different product categories. The importance of product characteristics was highlighted in the literature. Mac et al (2004) showed that promotion-induced purchase acceleration is dependent on the characteristics of the product and shoppers' perception of value.

Putis and Dhar (2001) identified that brand ownership and store size can impact on the extent to which promotions expand category sales as well as the sales of the promoted products. The results of this study are in line with these findings, with significant differences in promotional uplifts identified for own label and branded products (table 7.6 & 6.13).

These findings address gaps in the literature identified by previous studies. For example, Baron et al (1995) highlighted the lack of comparative analysis across product categories and between branded and own-label products. Significant variation in the fitted probability density functions for demand by product category (Fresh vs. ambient) and brand ownership (own label vs. brand label) provide evidence to support claims that promotional impacts are highly heterogeneous and significantly affected by product characteristics.

The next section explores the fourth factor that is believed to influence promotional impacts – store format.

**7.2.3 Store Format**

One of the research questions addressed in this research is the extent to which promotional impacts vary according to the characteristics of the store, and in particular the size of the store, as reflected in the retail format (Extra, Super, Express). This is a gap in the literature highlighted by Bucklin and Gupta(1999), who advocated that use of store level data in promotional planning, to reflect the heterogeneity of store performance and shopping missions – family shopping missions in extra stores versus top-up shopping in convenience stores. The results of this study provide evidence of the need to account for different store

characteristics when forecasting promotional uplifts (which impact stock levels and replenishment decisions), with significant differences in sales uplifts between the largest (extra) stores and the smallest (express) stores (see tables 6.3, 6.10 & 6.13).

Haupt and kagerer (2012) concluded that traditional estimates of the impact of promotions are misleading if consumer demand is not observed at the highest level of dis-aggregation. The results of this study supports this view.

### 7.2.5 Supply chain power

In addition to the four factors discussed above, one of the key observations from the executive interviews was the impact that asymmetrical power in relationships with retailers can have on the promotional cycle. Gómez and Rao, V. R. (2009) argued that suppliers have more control on manufacturing decisions and retailers on allocation decisions but this is not the case with small suppliers, whose voice is often not heard with regard to the design or execution of promotions. The point was repeatedly made that suppliers often feel obliged to promote their products but have little say in the design or execution. This is particularly the case with the suppliers own label products.

The exploitation of market power is particularly problematic when there are conflicting promotional objectives, which some of the suppliers indicated during the interviews. Retailers are often more interested in building store traffic, increasing the customer base and improving margins whereas suppliers are more interested in improving brand visibility and disposing excess inventory (Dreze and Bell, 2003). These conflicting objectives can result in reduced levels of collaboration and co-ordination during the promotional cycle, resulting in sub-optimal outcomes.

More effective use of information at different stage of the promotional cycle along the supply chain would reduce the impact of the power imbalance, as it improves visibility and reduces uncertainty.

The final section of this chapter considers the results of the simulation and optimization model.

## 7.3 Optimization results discussion

Third objective of this research is to improve the promotional performance by linking the disaggregated consumer demand with the stock allocation. Simulated output has given us clear picture about the relationship of stock allocation with the net revenue for a given promotional scenarios. These simulated outcomes for each product is then feed into the optimization model so that the best net revenue for that product can be achieved for a given delivery amount.

These optimized outcomes are then compared with the stock allocation scenarios where historical demand from previous years was used to make decisions about the stocks during promotional execution stage. Comparison of all the four products (belonging to the ambient and fresh produce category) has shown that executing sales promotions (by taking into account the disaggregated consumer demand by customer type and store type) is better than executing promotions based on historical demand.

Linking stock allocation with consumer purchasing behaviour at store level also validated Taylor and Fearne (2009) observation that linking upstream data with demand will improve revenues, inventory levels and reduces waste. It also shows that information sharing and order coordination can improve supply chain performance measured in better stock allocation. This improved performance directly impacts delivery plans and production scheduling as highlighted earlier in literature (Lummus et al., 2003; Kogan et al., 2008). Another important aspect of accurate stock allocation is better management of demand and capacity constraints of small food suppliers as highlighted by Zhao et al. (2002)

Using historical demand for estimating the stock during promotions was used by cooper et al. (1999) in their PromoCast model. Purpose of this design was to reduce stock-outs and minimize the cost of inventory. This was especially designed for sales promotions and uses retailer's historical records of sales and promotions. It was heavily dependent on finding meaningful patterns from consumer demand. These patterns then acted as decision rules for allocating stocks optimally during promotions. This research which simulates reality by

segmenting homogenous consumer demand into one category and then treating that category as single entity for the purpose of stock allocation can be a possible extension of this forecast system. Next paragraphs will discuss the results of this optimal stock allocation for each product category below.

As seen from graph 6.1, the difference between the optimized and historical outcome was narrower at low delivery amounts. But as the delivery amounts increases the difference between the optimized and historical demand grows. Trend in graph 6.1 shows that as the level of stock allocation increase, the difference between the optimized and historical output also increases. For example, at an approximate 34,000 units the difference is £4,000. Therefore, 1 kg own label carrot (belonging to fresh produce category) benefits more from optimized stock allocation at higher stock levels.

Trend in graph 6.2 (showing total net revenue comparison) of own label mango was interesting. At an approximate delivery amount of 34,000 units' difference in the net revenue is £15,000 and it increases significantly at higher delivery amount but difference is very narrow at low delivery amount. Therefore, both products from fresh produce will earn greater revenues if the stock allocation is done by simulating demand at the highest level of detail. However, for a similar delivery amount, promotional mechanic and price; net revenue generated by both these products is very different (revenues are higher for carrot then mango).

Trends in the ambient category products were very different in terms of shape of graphs and difference in revenues for a given delivery amount. Optimization results of sunflower oil (graph 6.4) showed a significant increase in revenue with optimal stock allocation for low delivery amounts. For example, at a very low delivery amount of 14,000 units the difference in the revenue was approx £35,000. But as the delivery amount increased the difference between the optimal and historical stock allocation scenarios were reduced. This was exactly the opposite trend from fresh produce where the difference of revenues increases with increase in delivery amounts.

Results section clearly answers the research questions identified earlier. Discussion with reference to the results explains the answers in more detail. Next section will highlight the key findings from these results and discussion. Based on these findings, recommendations will be given along with the research limitations.

# CHAPTER 8- CONCLUSIONS & LIMITATIONS

## 8.1 Introduction

This research clearly shows that sales promotions is a complex interplay of demand and supply side factors. It also shows that the use of highly aggregated demand data at critical decision making stages in the  promotional cycle has the potential to improve the promotional effectiveness. This finding is particularly important for small food supplier who have limited resources and therefore cannot afford to waste scarce resources on non-profitable or sub-optimal promotions.

This research fills important gaps in the theory, methodology and practice of sales promotions. Each of these contributions are discussed in this concluding chapter.

## 8.2 Theoretical Contribution

The primary theoretical contribution that this study makes relates to the co-ordination of supply and demand in the specific context of promotional planning and execution. Previous studies have focussed primarily on consumer response and those that have considered supply chain issues have focussed primarily on replenishment operations. This study is the first to explore the relationship between supply and demand through the promotional cycle, the role that (disaggregated demand) information plays in the generation of forecasts and the allocation of stock and the moderating role of market power. This builds on the work of Haupt and kagerer (2012) and Angell et al (2012) on the use of information in promotional planning and execution and the work of Gómez and Rao, V. R. (2009) on the role of power, in the specific context of relationships between supermarkets and small suppliers.

The findings are consistent with the conclusions of Blattberg and Neslin (1990), that promotions are a complex nexus of factors that involve interactions between many variables which cannot be adequately explained by a single theory. The interaction of supply and demand factors and operations from different parts of the supply chain, within and between organisations, requires the integration of theories drawn from marketing and operations management.

Howard and Sheth (1969) showed that inhibitors in the form of environmental forces limit the consumption choices of buyer. These can be in the form limited financial resources and they significantly influence buyers' decision to buy a product. Significant differences in consumer demand observed from price sensitive customers to upmarket customers at store level during sales promotions and its impact on promotional performance of product categories validates these exogenous variables of social status and financial resources of theory of buying behaviour. Price sensitive customers (classified by the retailer based on consumer's socio-economic factors) clearly behaved differently from affluent customers across all the store formats (extra, supermarket and express).

Another theoretical contribution lies in the empirical validity of individual differences (attitude) on consumption as shown in consumer decision model (Blackwell et al. 2001). They showed that individual differences of attitude and personality affect the decision making of consumers. For example, a price sensitive consumer will attach more importance to price and value as compared to an up market customer. This research clearly shows that consumer decisions shown in the form of historical demand is strongly impacted by how much value they attach to price. Price sensitive customers from both product categories were distinctly different from up market customers in all types of store formats which also resulted in different stock requirements for these customers.

## 8.3 Methodological Contribution

This research draws its strength from the scale and quality of consumer purchasing data and its use for simulating reality by practically understanding the process from the stakeholders and then applying it to optimize the stock allocation decisions. Therefore, its methodological contribution is around these dimensions as discussed below.

The use of dis-aggregated demand data from 1.9 million shoppers at store level from the biggest UK retailer provides a more objective and comprehensive understanding of customer purchasing behaviour. This study has identified, unequivocally, the benefits of using such rich information in simulation and optimisation modelling, for both demand forecasting and stock allocation decisions. The reliability and validity of previous studies (Ailawadi et al., 2007, Martínez-Ruiz et al., 2006b) have been compromised by their reliance

on scanner data. This study clearly demonstrates the advantages of using sales data dis-aggregated to the highest possible level – by shopper characteristics and at individual store level. The availability of supermarket loyalty card data makes this possible and this study is the first to apply this data in the context of promotional analysis.

Use of simulation modelling to understand the impact of different factors like weather, type of product and promotional mechanic is novel and has not been previously attempted by marketing or operations management researchers or the in the context of small food suppliers. Simulation models provide flexibility in analysing the impact of different scenarios to improve promotional execution. The use of this method has been recommended by previous researchers (Srinivasan et al. 1998) but has been applied with limited success (Andrews et al., 2011), due to a reliance on panel data, which does not contain the richness necessary for simulation methods to be used to greatest effect.

Another important methodological contribution of this research is the use of stakeholder perspectives in the design of the simulation and optimization model. All parameters and assumptions of simulation and optimization model were developed in consultation with stakeholders. This input has made the results of this research more robust and relevant to the specific context of small food businesses, whose decision-making processes are often distinctly different from large-scale manufacturers, on whom previous studies have been based.

Linking simulation with optimization to improve promotional stock allocation is also unique. There are no published studies in the marketing or operations management literature that have combined both methods to estimate (and optimise) the impact of promotions for different promotional scenarios – product types and promotional mechanics. The results show that the combination of these two methods significantly improves our understanding of the dynamics of the promotional cycle and the scope for improved promotional performance.

## 8.4 Practical Contribution to Industry

The explosion of retail promotions in the UK retail sector over the last decade has been the subject of considerable debate and the subject of considerable concern for brand managers

who have seen the value of their brands eroded and small-scale food producers, whose indiscriminate use of promotions has exposed many of them to an intolerable level of risk. In this context, any improvement in the understanding of the dynamics of retail promotions and any improvement in the methodologies used to predict and evaluate promotional performance will be welcomed by practitioners and, in particular, small food producers, whose specific circumstances have been largely ignored by previous researchers.

This thesis highlights the importance of information sharing at critical stages of promotional cycle both on the demand and supply side of decision-making. On the demand side it shows the benefit of using dis-aggregated demand data for the purpose of forecasting store level uplifts. On the supply side it shows the need to break down stock allocation decisions beyond the regional distribution centres to ensure replenishment takes account of the significant variation that exists in the impact of promotions across the different retail formats. Quite simply, this research demonstrates that the use of dis-aggregated sales data in the decision-making process will increase the probability that stock allocation will be optimized and consequently promotional revenues will be maximised.

Implications for this research go well beyond the scope of this thesis. Connecting demand and supply side through effective and relevant information sharing can change the way small business engage with their larger (and more powerful) retail customers. This can improve the balance of power between big retailers and give smaller suppliers an effective voice at key stages in the promotional cycle. The stakeholder interviews revealed that small suppliers make little or no use of information in the design of promotional strategies and little effort is made to evaluate the impact of promotions, beyond the aggregate increase in short-term sales. This research shows the importance of using information and the potential benefit thereof and provides evidence of the need to give small suppliers a voice in the decision-making process, to ensure that promotions are based on an objective assessment of consumer demand that is shared and understood by both suppliers and retailers. This will also make promotional activities more profitable and relationships more sustainable.

## 8.5 Limitations

The major imitation of this research relates to the synchronisation of the data available with operational decision-making. Specifically, stock replenishment decisions are made on a daily basis, resulting in deliveries being made on a daily basis and, in some cases twice a day. Thus, the actual replenishment process is more responsive than the simulation and optimisation model developed for this study. This is due to the availability of the supermarket loyalty card data and the weather data that was used to derive the demand forecasts and determine the stock allocation. Future studies should seek to break the data down further still and integrate different data sources, to improve the applicability of the model to the 'real world' context of daily adjustments to demand forecasts and stock replenishment decisions.

Another limitation of this research is the number of products used. The data requirements for the simulation and optimisation process are considerable and the generation of the necessary data is extremely time-consuming, given the permutations of product type, shopper type and store format. However, in order for the findings to be generalizable, further studies should seek to include a much broader (more product categories) and deeper (more products within each category) set of products.

## 8.6 Future recommendations

This research has focussed exclusively on the short-term impacts of sales promotions, yet the literature acknowledges the need to take a longer term view, to assess the impact of promotions on other variables – brand loyalty – and supply efficiency (primary production manufacturing and distribution). Future research should give consideration to the these other variables and combine the benefits of richer insights of short-term demand impacts with broader insights of the longer term impact of promotions on other parts of the business/supply chain.

This study was based exclusively on supermarket loyalty card data. Future studies should explore the integration of data from a variety of sources to increase the granularity of

insight at all stages of the supply chain and improve the level of process integration. This will require broader organisational input, which is often challenging, but is necessary if our simulation and optimisation models are to get closer to reality and make full advantage of the data that is available but at best under-utilised and at worst ignored.

Stock allocation model in this study considers allocation of stock from one central HQ. An interesting extension of this research would be to explore the impact of moving the stock allocation decisions closer to stores, starting with the allocation of stock to regional depots during the promotional cycle. This would improve our understanding of the impact that stock allocations at different points in the supply chain make on promotional performance and provide invaluable evidence to practitioners about where and how these decisions should be made, by whom and using what information.

This study generates forecasts of store level sales uplifts using dis-aggregated data for the promoted product alone. In reality, promotions are not applied in isolation and the impact of promotions will be significantly affected by the behaviour of competitors and other factors in-store – shelf positioning, point of sale material etc. Adding data that relates to the sales and promotional activity of competing brands and changes to the ranging and merchandising of products in-store would improve the accuracy of the demand forecasts and the applicability of the model to the real world.

Promotional evaluation and feedback is a critical stage of promotional cycle which improves the overall effectiveness by highlighting weakness and areas of improvement. Future research should try to incorporate this important step while designing sales promotions so that information sharing can be more effectively traced and accurate consumer insights can be achieved. This will also improve the collaboration between retailers and suppliers as they will have a chance to sit together and analyse promotional cycle in more detail.

## 8.7 Concluding statement

This thesis offers an in-depth and comprehensive understanding of interplay of demand and supply side factors in the promotional cycle. It clearly made the point that relevant and effective information at key stages of sales promotions will increase promotional performance and in doing so will make promotions more sustainable for environment,

suppliers and retailers. It also highlighted the importance of clustering consumers by their socio-economic factors at the store level as this will help in designing promotions closer to their needs and making stock allocation decisions influence by these factors to improve stock availability and increase revenues. Connecting disaggregated demand and stock allocation will also improve visibility across the chain for all stakeholders. This will help in optimum utilization of resources in terms of production, transportation and shelf space. Considering essential and relevant factors during promotional planning will help in executing promotions with less waste and more uplift as desired by both retailers and suppliers. Using actual purchasing data of such scale and quality to estimate reality and then improving net revenues makes this research applied in current business scenario of excessive promotions. It points both retailers and suppliers to an opportunity (in the form of actual purchasing data) to their full advantage especially in promotional environment where, chances of waste or missed opportunities are very high.

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**Appendices**

## Interview guide

**Aim & Objectives:**

The purpose of this interview is to identify potential impacts of effective use of disaggregated consumer information on promotional planning and execution. Information

gained in these interviews will inform the design of my simulation modelling. The model (see attach) breaks down sales promotions process into four key stages of decision making and execution which the interview will cover. These key processes are as follows

**1.** Objectives **2.** Planning process **3.** Implementation/ Execution **4.** Evaluation & Feedback

## Introduction (15- 20 min)

The interview will start with generic and open questions about interviewer's overall business strategy and role of promotions in it (i.e. increase sales, relationship building with Tesco). First, asking open questions about promotions and then specific promotional mechanic and their use. Why they apply specific promotional mechanic and its source of information. Afterwards questions relating to formal promotional strategy and its explanation (detail probe for context building). This will help design promotional management model for a specific mechanic of specific type of product for specific segment of customer.

## 1. Objectives (10-15 min)

In theory first stage of promotional cycle is establishment of specific promotional objective. This part of discussion is thus focused on the way and extend to which specific promotional objectives are set. How objectives are measured (i.e. increase in market share, sales increase) and who all are involved in it. Important questions to gain understanding of this key stage are

1. Do you set formal promotional objectives?
2. What are your key promotional objectives?
3. Which specific measures (i.e. increase in sales, market share gain) you use to evaluate these objectives?
4. Who is involved in making these objectives?
5. How far in advance they are set?
6. What is the source of information in designing these objectives?

## 2. Planning (10-15 min)

Having established promotional objectives next stage in promotional literature is making of promotional plan given the agreed objectives. This is the second stage in decision making process of sales promotions. Promotional planning is the detail road map to achieve promotional objectives. Key questions are

1. What are the key stages and considerations in promotional execution that requires planning (i.e. level of increase sales, level of increase stock, no of stores)?
2. How do you design promotional planning process?
3. What key processes/activities (i.e. production, stock management, distribution management, labelling, packaging, advertisement, point of sales material) are involved in planning processes?

4. How these stages are linked to promotional objectives?
5. Who is involved in promotional planning process?
6. What are the important sources of information in promotional planning?
7. What is the level of disaggregation in your information use?
8. What are the key processes in production planning?
9. How production planning is incorporated in promotional plan?
10. Who is involved in production planning process?
11. What are the key processes in stock management planning during sales promotions?
12. How stock management is included in promotional planning?
13. Who are involved in designing stock management planning process?
14. What are the key processes in distribution management?
15. How distribution management is included in planning?
16. Who are involved in distribution management planning process?
17. What are the key processes in packaging planning?
18. How packaging is included in planning?
19. Who are involved in package planning process?

## 3. Implementation/Execution (10-15 min)

The critical stage of promotional cycle is how much of what is planned actually happens. The literature suggests that many of the decisions around promotions are done without formal planning and research. This is third key stage in sales promotions process. Key questions are

1. What are the key considerations while executing sales promotions?
2. How do you actually execute sales promotions?
3. Why promotion execution is not done as per planning?
4. How do you execute actual promotional production process?
5. Why actual production planning is not as per production plan?
6. How do you execute actual stock management process?
7. Why actual stock management is not executed as per the planning?
8. How do you actually manage distribution of promotional stock?
9. Why actual distribution management process is different from planning?
10. How do you actually manage packaging of promotional stock?
11. Why actual promotional packaging process is different from planning?

## 4. Evaluation & Feedback (10-15 min)
This is an important stage which literature says is often missed because too many random process/ are going in sales promotions. It is done after sales promotion is executed. Key questions are
1. Do you formally evaluate sales promotions?
2. If no, why don't you evaluate?

3. If yes, how do you evaluate sales promotions?
4. What information is used to evaluate sales promotions?
5. Who all are involved in promotional evaluation?
6. How that evaluation is feedback into the next promotional cycle?

## Amended Interview Guide (retailer)

**Aim & Objectives:**

The purpose of this interview is to a) gain an understanding of the current processes for the planning and execution of supermarket promotions, b) identify potential areas for improvement, where processes are either flawed or not consistently implemented and c)

explore the potential benefits of making more/better use of consumer insight at various stages in the promotion cycle. The Information gathered will be treated in strict confidence and not attributed to any one individual or business. It will be used to inform the design of a simulation model for the purpose of improving the efficiency and effectiveness of supermarket promotions. The model (see attached) breaks down the promotion cycle into four key stages:

**1.** Setting Objectives **2.** Planning  3. Implementation  4. Evaluation & Feedback

**Introduction (15-20mins)**
The interview will start with an overview of the role that promotions play in the business (how important they are), their impact on key areas (e.g. sales, operations management, waste and profitability) and the promotional strategies adopted for different products, markets, customers etc (how formalised is the promotions strategy and how differentiated is it for different contexts?).

**Stage 1 - Setting Objectives (15-20mins)**
In theory the first stage of the promotion cycle is the establishment of specific objective. This part of the interview is thus focused on:
a) The extent to which distinct promotional objectives are set for each promotion
b) How they are measured (i.e. increase in market share, sales, repeat purchase)
c) Who is involved in the setting of objectives, and
d) What information is used to inform the objectives set?

**Stage 2 - Planning (15-20mins)**

Promotional planning provides the detailed roadmap to ensure the promotional objectives are met. The key questions here are;

a) What are the key variables on which planning are focussed (manufacturing, distribution, stock management, packaging, POS etc)?
b) Who is involved in the different parts of the planning process (production, distribution, stock management, packaging and POS)?
c) How are the different functional areas integrated in the planning process (changes in one area impact on all of the others, so how is this managed)?
d) What information is used to inform the planning process for each of these functional areas?

**3. Implementation (15-20mins)**

The literature suggests that a significant proportion of promotional activity is done without formal planning and that the execution is not always in line with what was planned, for a variety of reasons. Thus, the key questions here are:

a) How much of what is planned actually happens?

b) Which areas of the promotional plan are (most) critical in terms of implementation and there attract the greatest attention

c) How often does the implementation follow the plan, at different stages in the promotion cycle (production, distribution, stock management, packaging and POS)?

d) What are the main areas in which problems occur and why?

## 4. Evaluation & Feedback (15-20mins)

This is an important stage which, according to the literature, is often missed due to lack of time, a lack of information or both. Thus, the key questions here are:

a) Is there a formal process for evaluating promotions? If yes, what is it and if not why not?

b) Who is involved in the evaluation process and who receives any feedback generated?

c) What information is used in the evaluation process and how is the feedback delivered to the different stakeholders (internal/external)?

d) How is feedback used in subsequent promotional cycles?

## 4. Conclusion (5mins)

Conclude the interview by asking the interviewee if there are any outstanding issues that have not been addressed. Explain that the interview will be transcribed and that you will send a summary of the key points identified, for confirmation/clarification. Finally, thank the respondent and close the interview.

## Transcripts
## Fresh produce

## Transcripts of Sara (Apples)

**Sheraz:** I will formally welcome you. My name is Sheraz and I am from Kent Business School. I am doing research in sales promotions. The purpose of this interview is to gain an understanding of the current process of the sales promotions. To identify the potential

areas of improvements where the processes are either flawed or not consistent and the potential use of consumer demand information in the promotional cycle. Whatever information I will get from you will be in the strictest of the confidentiality and will not be shared with anyone. It's a purely academic exercise and this information will help me designing a model where I can improve the effectiveness the supermarket promotions. In literature sales promotions is defined as action focused event whose purpose is to influence the consumer behaviour either in the short term or long term. So if I ask you what does the sales promotions means to you as a company?

**Sara:** we run two separate promotions tools so we have a marketing plan which is all around the aspiration. For one brand cameo apples we are running a health aspiration diet focus plan around much of the season. What we are trying to do is encouraging the people not just to buy couple of more apples with each visit to the store but to buy healthy. It's already in the media so it's easy to engage with. Driving awareness hopefully to increase the sales and driving the volume as you pick up the health plan. We hope you will follow the 4 apples a day in it, which is three more then the average. Then there is financial promotion that is money off promotions in the beginning of the season in bits and pieces. We are also engaging in text marketing where if you have a code you text it to us we will give you 50 pence off.

**Sheraz:** So as I see it you have a very short term promotional objective to increase the promotional volume is it only short term or it has any long term benefit or its the combination of both?

**Sara:** its combination of both. We work in fresh produce where everything has short shelf life and seasonality. So what we want to do is that we have a short term financial incentive to drive volumes to increase people awareness that's its now avail as its in the season. Then you have long term objective that is to build loyalty and encouraging people to do repeat purchase.

**Sheraz:** So if I as your short term objective are to increase volume and long term objective is to increase customer loyalty?

**Sara:** yup. You are absolutely right.

**Sheraz:** Is it something to do with category expansion or increasing sales value or broadening the customer base?

**Sara:** as a lot of my business is focus on apples. And lot of my focus in that is to improve market share. If you go 25 years ago apple was the most commonly eaten fruit. Now they are behind bananas and berries. There is awful lot of drive behind the sales plan now is to increase the volume of apples eaten to retake that lost market share. So when you are running the promotions this thing is in your mind that you have to overtake the bananas and berries.

**Sheraz:** do you assign a specific promotional objective to a specific promotional mechanic?

**Sara:** yes.

**Sheraz:** ok so can you give me an example.

**Sara:** for example if you take a seasonally Cox apple as an example. When you write the seasonal plan, you know when they goanna be ready and so 4th week of September for instance. To start driving the sales then you have deep cut promotional mechanic. So you will do BOGOF or half price promotions before you have several days of sales where it's on full price. Then on deep cut promotions you shift where you can locate it on the shelf. So you will go the end of aisle position or you will go for foyer on a square where they have big banner and it's a big headlight thing. It will go on weekly flyer on club card promotions. You are looking at the position of the store, the signage, voucher driven money off, also physically on bag this is now half price. So you start the season with the deep cut price promotions which will drive the demand.

**Sheraz:** Do you employ certain non- price promotions like competition, holidays?

**Sara:** absolutely, its quiet a scene going on now. The good example is robin apples. Robin is driving the customer demand on awareness through consumer led liking, share face book promotions. Every week there is a holiday plans. For example there is a week in Paris one week and next week another holiday trip. The offer is that you like the page of the apple and share the picture with your friend and you will be enter into the competition.

**Sheraz:** how do you measure its success?

**Sara:** This is driving traffic through face book page and they are very successful in that. Its evident by the Tesco and twitter feed. It's about engagement with the people. It's a very different way. It's not only about aware of buying the apple but to be rewarded to buy an apple.

**Sheraz:** So you are saying you are using social media for this purpose?

**Sara:** There is no brand of apple that is not doing this now.

**Sheraz:** How do you measure your promotional objectives?

**Sara:** In the social media it's about traffic.

**Sheraz:** For price promotions what are your measure?

**Sara:** promotional volumes. So when you say programmes. We see what we did last year in terms of previous sales history. We see we will sell x number of 100 thousands cases at half price. You commit to those promotions it will run for 10 or 14 days. it will measure by the pickup rate.

**Sheraz:** so it's nothing to do with the value it's only about volume?

**Sara:** only volume yes.

**Sheraz:** Can i ask you why you are so much focused on volume whereas value takes the holistic picture?

**Sara:** In produce you have a crop which has a short shelf life. Once you open the store you have to clear them. If you decide about promotions you have to commit early about the volume of fruit you will be sending them. So for example you will commit 50k cases for half price promotions. If you go on promotions on commodity product it will not earn you lot of money but it maintains your position with the buyer. And it helps to fill it. If you commit so you want to drive sales for limited time but after that you make better margins to compensate for the promotions.

**Sheraz:** you are saying it makes sense that as the product has very short shelf life and so it reduce waste and driving the traffic itself.

**Sara:** This is it. You drive consumer demand by increasing people awareness by telling them it's available. Then people will include that into their shopping lists. So they know exactly it's on the shelf.

**Sheraz:** Who is involved into the planning process of sales promotions?

**Sara:** The commercial marketing managers.

**Sheraz:** only she is involved?

**Sara:** yes.

**Sheraz:** No one from supply chain.

**Sara:** The information is given to you by the technical team. Your grower will tell you how much product they have got. The promotion that runs in October is set in May. Before you

harvest you know roughly what amount or volume of the apples that will be available for the season. Therefore, the plan is in place. so you know what types of varieties you expect in 20 weeks. After 20 weeks we will have six months promotions. We have to ensure the flow of product is adequate to meet and shelf life.

**Sheraz:** so what information is used expect pervious sales history in setting the promotional sales objectives?

**Sara:** you have your historical data, sales figure from the previous season. You have the data from grower where they will tell you when they are ready to take the access crop. You know from the previous performance what volume you will have from marketable policy. You have the figure where you have the actual volume that will be harvested and then the expected volume that will make crop one.

**Sheraz:** what is the input from managerial judgment?

**Sara:** you have lot of sales data you have retail sales figure, historical data from retailers, the format in which the product is being sold. Some have a bag format; others have 4 or 5 apples format. So you are looking across and see which lines you want to drive sales within. It's usually the bag format which has the promotions as it's an easy pick up. It will be 1 pound a bag and you will get 25 percent off or whatever it is.

**Sheraz:** who is your target customer?

**Sara:** weekly shoppers.

**Sheraz:** Any specific customer in terms of age, demographics or income level?

**Sara:** because fruit is the commodity food product. You divide it into type of format like finest taste the difference this will be for higher income aspiration middle class customer looking for quality and something different. On the other hand you are looking at family packs Large packs with small apples with the kids. This is differentiating by the pack format. Do you have a finest quality apple and you want to promote it next year so I will be focusing on specific customer segment.

**Sheraz:** So you will be focusing on specific customer segment?

**Sara:** yeah we do and then we commission about the other social marketing plan so you might commission in the store magazine. These are the other bits of the media for. You go the retailers and you have broad national media strategy. It can be social media tool. You can use in store publication and or retailers website as well. It focuses on the people who

read about the food and they will learn where the food comes from. It will give them some good message about the provenance about the product and who grew it.

**Sheraz:** what in your opinion works better price or non price promotions?

**Sara:** it's very difficult price promotions is engaging with the customer but there is a political side to this. By engaging in media led variety and engaging in the research consumer data. You gain the attention of the team within the retailer. So part of the promotions is working outside the retailers with the customer and part of it is within the retailers. So as they are so different so you cannot compare it and say it this is more successful or not. Probably the most successful blunt instrument is the half price promotions. because that all drives demand after some promotions period you have paled off in sales volume but you always a overall drive you increase the sales post promotion.

**Sheraz:** do you have post promotion dip in your promotional cycle?

**Sara:** There will always be a proportional of shoppers who will only shop while on promotion cycle. They are always looking for best price. These are people with tight budget and that's true with absolutely every product.

**Sheraz:** So do you factor in this fact?

**Sara:** no, you have to be pragmatic and have to accept that every promotional cycle you will be rewarding the people who buy your product weekly. They will be loyal to you and there will be proportion of those who will be attracted to you due to temporary price cut.

**Sheraz:** So you cannot create a promotional strategy for loyal customer or temporary customer?

**Sara:** we can ensure the quality remains the same so that if a person buys our product he will come again to buy it due to persistent quality. This will create loyalty and demand.

**Sheraz:** What is your promotional waste?

**Sara:** I cannot give a figure on that for three different supply companies and there are 120 lines in between them. We are hopefully looking at a waste of less than 3 percent. **Sheraz:** For this is very less waste for a fresh produce category with such a short shelf life how do you manage to have this?

**Sara:** there is a till service data which inform the store during the process which then consolidated. So you have outline programme which is agreed in advance based on the pervious sales history. We know that previous year when we promoted how much you sold.

So you pre-plan those and during the promotional cycle this becomes responsive against the sales.

**Sheraz:** So there must be things that don't go as per planned?

**Sara:** probably what you are writing in May for fruit is 75 percent right.

**Sheraz:** Do you have a secondary market to dispose your product if its not sold as per your plan?

**Sara:** yes, we have discount lines like you have got basic. Other goes in fruit servicing whole sales processing, for juice for prime mixes.

**Sheraz:** So what happen to the 3 percent which has no business value?

**Sara:** if it's not class 1 fruit apple then its goes to waste. Others go to juice and processing.

**Sheraz:** So coming after to the execution phase of promotions can you identify me the most critical areas of the sales promotions?

**Sara:** you got to have a good historical data. You cannot take a guess. You got to know what you did last year or a year before, week on week. We need to know how customer responded and how well the promotions worked.

What volumes you sold through within the period, next come the technical information do you have adequate stocks avail of suitable quality, you make sure you are communicating it with the suppliers every marketing desk will not growing their product they will have a group of growers that they represent. They need to be aware and they should manage the storage, their packaging facilities. So you have your published programme and communication with the buyers. What you have available and at what price.

**Sheraz:** So what about minor hiccups in the supply chain?

**Sara:** no one retailer has one supplier. If you have issue with the suppliers, suppliers work and help each other to ensure the retailers are not disappointed. If they have challenge meeting the demand of the retailers then suppliers will generally manage within themselves. For example there was an issue with deep cut promotions volume with the gala. one desk was not having availability with the price their retailers was looking for but on other desk has growers which were prepared to take that price as they need to sell their fruit because it was decreasing in quality. So the order plan changed from one supplier to others. So there is reasonable amount of fluidity in the supply.

**Sheraz:** so you are saying they are flexible and robust enough to manage it?

**Sara:** yes

**Sheraz:** how close are these processes in the chain?

**Sara:** when you are part of the suppliers group for retailers there are weekly meetings with the buyers and everybody is representative and also a monthly marketing meeting. Where you look into whats coming the month ahead, you are looking into the promotional activity; you look at the sales volume. It's the opportunity to say for everybody. Actually we will not be able to make that volume, we can do 60 percent can somebody else pick up the rest.

**Sheraz:** Do you perform specialize promotional meeting?

**Sara:** yes absolutely for October promotions we meet in May for forward planning process. There are series of meeting between the buyers and the commercial manager and the marketing managers from the suppliers. So they will decide the depth of the promotions they are putting together the period of promotions the amount of activity in other media or press that will accompany. That is not planned in isolation they are planned as a group. To ensure the retailers have what they require.

**Sheraz:** what's the impact of season on the demand?

**Sara:** you cannot manage at all. We have a huge problem this year because we have a very late harvest in the summer period so shelf posturing we don't have dessert basically southern Hampshire did not have a late season and their harvest came on time. Whereas, large portion British fruit was not present so there was issue finding alternative suppliers in that three weeks gaps in that year.

**Sheraz:** so seasonality does impact your all stages of business?

**Sara:** yes, very much so if you are stock fruit grower you have all these plants with the fruits on them. They will pretty much ripen comes what may and there is production schedule for that. So if you have a week of real horrible cold weather so people stop eating strawberries. So there is an issue what will goanna happen and where that product will go. The weather has a great deal of effect on the profitability.

**Sheraz:** can you identify me the most challenging area in the promotional cycle?

**Sara:** it's the purchasing trend its weather driven. A lot of the problem in the fresh produce you have is due to the weather in this year luckily you have a very warm weather and people start eating summer style diet so they won't be pies but if the weather is horrible they will like to have pies because, people dietary habits change with the weather.

**Sheraz:** You have an advance weather forecast so do you have ample reaction time? **Sara:** you have certain type of levy to manage the things but once you open the cold store and fruits start to ripen it. it got to sell it.

**Sheraz:** So there is some sort of variation in your demand pattern as well?

**Sara:** yes, if you have a back log of promotions that has to be dispose of quickly then you have to do short term promotions.

**Sheraz:** So can I say it's the consumer demand that is affected by different complex weather that is challenging?

**Sara:** yeah more or less it effects. We want the promotions we plan and its execution fetch us enough income. You have lot of problem with the retailers competing for the market share. So we have people like Tesco who benchmark against ASDA. ASDA does not have a particularly strong commitment to buy local produce. Tesco has high commitment to buy local produce. So the provenance is high quality to low and British and non-British. So there is a challenge in between that. So in Sainsbury who are fighting the market share with the discounters because, they have a very ethical purchasing programme and very ethical approach for their suppliers. It causes lot of pressure as buyer there to increase its margin and match or compete with the pricing with the other retailers. They are tied with the procurement group which they cannot compete with the price.

**Sheraz:** Does it ever happen that retailers force you to do price promotions?

**Sara:** Yes but then the strong commercial managers that if you have to take the hit of promotional period like that then you are able to recoup that lost with pricing and structure with the rest of the period.

**Sheraz:** so what are the profit margins on the promotions?

**Sara:** it's very difficult as i run on the media side of it. So if you are bag promotion at the moment for 1 pound buyer will be willing to pay in the region of 60 pence for that. And growers want it by 70 percent.

**Sheraz:** So can i say it is ten percent?

**Sara:** yes. You manage that at a later period. It also depends on the varieties. Things like Cox as it's widely produce variety. The promotion has to very deep cut and average price paid for that is actually very lower. On other hand if you go to Rubin it's very high quality very

expensive to produce. So those growers will be looking towards 90 pence a bag. That will not go on one pound promotion.

**Sheraz:** So this change with the type of variety and type of promotional mechanic applied?

**Sara:** absolutely for every retailer you have an average variety. There are varieties at the top Rubin, cameo, annilia. All these offer premium, good quality guarantee and attract high end customer. They have a different set of mechanic and different average pricing compare with gala and Cox. Which are commodity prices which are available pretty much anywhere and they are available very cheaply.

**Sheraz:** Do you do any evaluation after promotions?

**Sara:** There is weekly evaluation and monthly evaluation and seasonal one as well. Constantly evaluating the position and volume sold at the previous year. How stocks are being managed. Whether there is an emerging sort of pattern on the variety. So there is constant evaluation which mechanics work.

**Sheraz:** Do you change your strategy of things are not going as per plan?

**Sara:** yes we do midyear review which happens just after Christmas. All the varieties that are available Jan, Feb and March. Those are changed to that structure. If the 25 percent of the plan does not come through then there is a biggest change occurring there.

**Sheraz:** So you are saying you manage things if there is a problem?

**Sara:** Yes as it's a short shelf life so you have to be responsive. You have to be responsive to ensure that you are managing your stock properly.

**Sheraz:** who is involved in the feedback process?

**Sara:** buyer and technical manager, retailer and marketing manager.

**Sheraz:** so the supply chain is managed by the technical manager?

**Sara:** it's a partnership you cannot run a promotion in isolation.

**Sheraz:** so all the stakeholders are on board when you do the evaluation?

**Sara:** absolutely. If you have changes during the evaluation process then it can be done as frequently as weekly or 6 monthly. For example the weekly plan is published on the Tuesday morning. On Monday there is evaluation of the previous week trading cycle. Promotional success, evaluation of stocks, and tweaking on pricing all those things happen on Monday and then published on Tuesdays that part of weekly evaluation process.

**Sheraz:** If you are given the option to run a promotion in an area where your target customer lives so would you like to promoted in that specific area.?

**Sara:** It will be lovely. So you are talking about depth of Dunnhumby set of data. So you know what sort of customer is there, you know what people like to cook and people like something new. It will be lovely delivering different group of people what they want and see what that impact on demand.

**Sheraz:** So why can't you do it?

**Sara:** because no retailer will give you the option to manage their stock.

**Sheraz:** so you are saying that you would love to do it but system does not allow you to do it?

**Sara:** yes, it's too large like Tesco. You may do it in a specific region so for example clusters of stores supplied by one depot. But its unlikely cause system is quiet inflexible in terms of that level of responsive programming.

**Sheraz:** Have you ever considered doing the passive promotions in that store without involving the retailers?

**Sara:** few years ago it was very popular to do sampling and engage customer. Tesco has got a local procurement project where they offer people to get the vouchers for money off but it has absolutely no impact on stores at all.

**Sheraz:** so you are saying you have tried a promotion to increase the trail of a new product but it was not successful?

**Sara:** we tried it but it has no impact at all.

**Sheraz:** If i ask you regarding the stock management of the stores based on segmented consumer demand?

**Sara:** I think system takes into consideration we cannot force it to manage a stock based on certain demand of a line. They system will reset it as to what does to the till because it automatically programmed to manage waste. If there is no demand to certain stores the system response to that.

**Sheraz:** So it's down to retailers to manage that not you?

**Sara:** absolutely and they will also not like us to influence it either. Yes because the procurement managers are extremely knowledgeable people. They know their area and they manage their stock very positively. Within the retailers there is an opportunity to do

that at store level keeping in view the customer demand and store stocks. As a general rule, though it is down to the seasonal plan and depending on the store size. For 5 stores you have a particular allocation for a particular line and for a given planogram. You know how your department have to look like.

**Sheraz:** Did it ever happen that you went out of stock?

**Sara:** it can happen but it happens only on one day, because orders will increase for delivery for the next day. Because there is a system of flag up issues and orders will increase automatically.

**Sheraz:** This is equally valid for promotional waste as well?

**Sara:** yes.

**Sheraz:** so why forecasting is not accurate?

**Sara:** it cannot, as you can't predict what people goanna will do?

**Sheraz:** You have a data which has all the consumer demand information age, income level where it lives so do you consider using it in planning?

**Sara:** off course we use it.

**Sheraz:** Can you give me a typical example?

**Sara:** So if you have a new product and you want it to be in the right place and packing. We look into customer habit, see other varieties, do a little bit of research in stores, do some sampling, and engage in mums net. Or purchase some data from kantar or dunnhumby. So you are looking into the people and target group and what they like. So you can refine your offer and packaging based on that information.

**Sheraz:** Thank you very much, Sara for your time. Are there any questions or queries about this interview?

**Sara:** No, thank you very much.

**Sheraz:** The interview will be transcribed and will send a summary of the key points identified, for confirmation/clarification. Thank you.

## Transcripts (Simon, carrots)

**Sheraz:** Thank you very much Simon for taking your time. My name is sheraz and I am doing my research with Prof Andrew Fearne and specifically focused on use of promotion for the

benefit of small suppliers of Tesco. My core aim is to learn the practical process of sales promotions and see how consumer insight in the form of Dunnhumby data can be better used for the sales promotions planning and execution. What is the level of waste into the promotional sales? I will be using the information to build simulation modelling. This is the last in the series of interview's have conducted two in fresh produce category. In literature the sales promotion is defined as the process of inducing consumer either in short or long term. So if i ask you what is the sales promotions means to you as a business?

**Simon:** it means really the way of driving more volume for our customer and our business as well. It means trying to bring more customers into the category and also as a way of helping our main customer Tesco. It helps them improve their performance measures so volume share profitability market shares comparison versus their competition and overall performance of the area. So it's about selling more to improve the performance of the area. So look into another way fresh produce is a very mature category and also its very susceptible to weather so hot cold wet sunshine and also seasonality. So we deal with two types of categories. Root veg is a winter oriented category. Salad and lettuce is very summer oriented category. The time of year greatly affects the outcome of promotions. The other thing with the produce is that because of seasonality and weather effects. Its very difficult to measure the promotion is successful or not because it's been effected by so many other different factors. The other issue its more day to day short life fast moving volatile type of product. So it's hard being scientific about which promotion work and which promotions don't work. So generally and this is true about most retailer or all retailers. historically promotions is more on a gut feeling or what might buyer want to do or likes, or their boss is telling them to do or what's the corporate theme at the time. So it's a more of random approach to.

**Sheraz:** So you are saying there is no sophisticated way of looking at this. As it's a fresh produce so it's very much affected by the weather. So if you make a measure it can be ruined in one day due to the weather.

**Simon:** yeah, for example there is one third off , you might find there is 30 degree outside .its fruit time, you expected it to be cold, it's snowing you plan your promotions for two weeks. For all of sudden, the weather changes & its 25 degree outside. The promotion does

not work other categories are less seasonally affected like cereals and ambient categories like cooking oil. The volatile dynamics causes the issues. The other things that tend to happen that retailers tend to be more incline to their corporate strategy. We are constantly asked we want a promotion plan from you. So we spent a long time carefully thinking about the promotions plan. We present it. The buying team says thank you very much and its screwed up and put in the basket. And their internal marketing team comes and says we are doing this price promotion. The corporate strategy has a big effect. The other thing with the produce is that in aisle on end promotion affects the sale. The position of where the product is in the store affects has the most effect of the promotions works or not. The case is this if you want to put 1 kilo bag of carrot on promotions in the aisle at half price even and you may not have even an uplift to recover enough profit before the promotions. However you can put one kilo of carrot for one pound on the promotion end. You put the sticker as what the price on it. You can have a dramatic uplift. So really in store promotions it's the positioning of the product rather than the mechanic which seems to be the most important factor.

**Sheraz:** if I want to isolate a single short term measure it will be sales volume in whatever crude terms?

**Simon:** yes

**Sheraz:** is there any distinct promotional mechanic to certain promotional mechanic?
**Simon:** the answer to that is it should be but it tends not to be. This is my perspective rather than the official retailers will tell you. If you ask retailers they will say yeah we have thought so yeah. It's not. It's about impact of everything together that's the most things. That's why they go for corporate things then the individual mechanics. It's on gut feel.

**Sheraz:** The measure of success or failure is totally based on sales volume?

**Simon:** it's different for different retailers.

**Sheraz:** Can you give an example?

**Simon:** for example Tesco is measure it on epos sales. It's very accurate ac Nielsen measures all through the check out. Of all the retailers then they will tell the individual with the whole

market. If you look at Waitrose they don't have shareholders. It's more about the corporate theme, keeping customer happy. They look at market share but the absolute measurement is about profit margins, returns on that promotions. Whereas, Tesco is absolutely committed on keeping their customer happy. Am I selling more to more customers. It's about sales volume but it's also about bringing new people to the category.

**Sheraz:** So it's increasing the customer base and increasing the category itself?

**Simon:** that's right yes, if I use Dunhumby terminology it's the customer penetration so the number of shoppers in that category for that retailer.

**Sheraz:** What set of information you use to make these decisions?

**Simon:** We look at the forecast I don't know if it's relevant or not we need to plan volumes. But we tend to be harvest a day before so we don't have any product in stock. It is a short shelf time. You will plan through the year as there will be some promotions. So plan more than the absolute minimum to maintain the sequel fluctuations but you know a particular retailer will promote at particular time. So you try to look what they did last year. So it's the sales history and we also use very short term forecast. So the target is 50 percent or 100 percent so we know what we are packing, harvesting and people.

**Sheraz:** How much is your judgment into their planning?

**Simon:** Historically the retailers forecasting is reasonably inaccurate. it's in the range of 50-100%.

**Sheraz:** What do you think is the source of that?

**Simon:** it's the seasonality, yes. The things that comes into effect is weather season positioning is the product sticker by the manufacture or not, store compliance. Some of them are very poor in terms of promotional advertisement and also what else is on promotions. It has a very key affect on Sunday lunch or Sunday dinner. And you have choice between broccoli and very next its carrot on promotions

Is broccoli promotion more attractive you might buy broccoli. There is also an influence of prepared product. The type of products that are growing has an impact on the choice of people buying.

**Sheraz:** What are the key variables in sales promotional planning?

**Simon:** if you are talking about the retailers we are dealing with we get a phone call or an email not more than 2 weeks before the promotions starts. We tend to produce small companies with small team of peoples. Therefore it's the case of going together very quickly. sending an email with everybody that is involved in the promotion really making sure that harvesting teams are set up production process is set up to encompass that bigger volume. Usually at this time of year we have spare capacity to absorb it.

**Sheraz:** It looks like a fire fighting you are told to do something and all together there are things going on?

**Simon:** it sounds like it but it's not because we are so well drilled dealing with fluctuations because our volume can fluctuate with the weather. The supermarket puts steps on their orders. If there is cold they may increase the orders but they may do that at very short notice or they may give very poor forecast. So we are used to dealing with wide fluctuations in the demand. The carrots come in big truck loads 44 tons they get delivered. We are planning 3-4 days ahead how many loads we going to harvest and then close to the time we see if it's enough or too much. Adjusting those loads coming through then we looks at those loads. We then either double up or increase the people. We try to use our own people to manage that load.

**Sheraz:** How integrated are all these process of harvesting packaging, stock management and quality control?

**Simon:** completely. If I ask you about the criticality of the process or all of them are critical?

**Sheraz:** the key things are a) have we planted enough for any given point in time then ensure we have enough loads coming in to be washed and then making sure we have got enough people to pack. But once the product gets to our factory it washed packed and delivered probably of max 12 hours. Washing and packing takes half an hour for one carrot to go through the washing process the grading process the selection process. It's all much automated. We do have some people at the end of the line doing final quality checks before products goes into the bag. It's pretty automated and short process.

**Sheraz:** Because of promotion there has to be additional load?

**Simon:** there is a limit for machine to pack. For additional volumes we get more machines. For additional volumes with capacity spare, we run with probably with 50 percent spare. It sounds ridiculous. In xmas week or the week leading to the xmas and also Easter. We are running on 110 percent of the capacity. I know it sounds stupid you bring in additional kits bits and bolts. Do you whatever you can to give you additional capacities but there are always machines which are spare for some other time. There are other bits of the kit taken into use on that time. In promotions normal scheme of things there are not much problem. Because, we have range of customer and range of volumes. If you look at the weekly volumes other then the xmas where you get a massive spike. It's pretty much the same every year.

**Sheraz:** But you cannot get raw material more at such a short time like you cannot tell carrot to grow more?

**Simon:** well you can with the crops to come on. In case of carrot what we do it has growing cycle. we are planting throughout the middle of the season so we plant through the summer its ready by autumn winter what you do is that you put layer of polythene on before the frost comes then layer of straw. Then carrot lay there in suspension in the ground for several months. For potato you have it and then you store it. Then you take product out as you need them. Carrots you cannot do that we store them on ground and open up field when we need them.

**Sheraz:** So they are in suspended animation?

**Simon:** Yes, it's sitting there in the form of bunch. Carrots grow then you put it back because you don't need re-growth. You put polythene over and big pile of straw to insulate from frost damage. Then they sit there for several months. Then when you want to harvest them, you come along you take up the straw, you roll up the polythene and then you harvest that row of carrots.

**Sheraz:** what's the promotional waste?

**Simon:** retailers don't worry about root veg waste but it's very very low. Summer can higher its one percent.

**Sheraz:** Do you have any secondary market to dispose off?

**Simon:** its ongoing we have range of product quality. So the best quality goes into the standard bag then for Tesco they have every day value for a lower quality. We also have customer who will take range of quality. Then we have process that will take the broken carrots the bits and pieces. I will say 80-90 percent goes to the retailers. Likes of Tesco's.

**Sheraz:** If I ask what's the waste with no business value?

**Simon:** it's between 1-2 percent. From our point of view there is no promotional waste. Because we are harvesting what we need and packing what we need. The carrot is quality is same in every bag. It's low in everyday value. It's higher in pre-packed higher quality. We use different size grades for different packs. For big pack for small pack and loose carrots.

**Sheraz:** do you have a specific promotional meeting as such?

**Simon:** it's a very brief ad-hoc meeting which says what's going on are we all onboard. It's a just an email to all telling a promotion is coming up. it's one minute meeting. Is everybody clear on that? You have harvest going along it takes carrot out it drives the tractor. The carrots will come out we dug out go up the conveyer into the truck 44 tons filled. There will be huntpac transport waiting it will hook up the trailer that will go up.

**Sheraz:** what's the range of the things not happing as per planned in execution phase?

**Simon:** the thing is this that some promotions are very very large. You can have a huge uplift. It's the case of holding on and recalling enough loads from the fields make sure you have ensure the packaging is going on putting the product. Keeping the staff working longer making sure you have got enough packaging but when you have a promotion on bag of carrot. You find that a sale on the promotion also goes down. So while you get spike with one product the other product sale will go down. So you may get one product doing that and one product doing that. But overall the effect is more or less same. That's how the promotion works. We tend not to promote with all the retailers. We have got a number of retailers which we supply. The promotions may have a huge spike if there is an advertisement going on.

**Sheraz:** when you others volume go down what do you mean by that?

**Simon:** loose carrot a big bag of carrots and small bag of carrots. You have a value bag of carrots. You have a baby carrots lines. It's a smaller range it's a loose bag. **Sheraz:** Do you have any target customer?

**Simon:** no, produce suppliers and manufacturers have struggled to get grips with data to help them promotional planning.

**Sheraz:** Why is that?

**Simon:** Really there are couple of retailers who have this type of data at any level. Waitrose has started with my Waitrose with very early stage. it's really about Tesco even Dunhumby struggle to tell Tesco how they can manage promotion better. Its literary throwing the dart on the dartboard. We have just started this year working with Kent business school in the last few months. We are the first suppliers to do this some of our big competitors has had Dunnmby but buyers has not time to study it they are into other big things. Produce suppliers are farming experts they are not marketing or supply chain experts. With all the volatility we talked about and if you run promotions it's like only one line in the whole range. Because if you run into so many promotions that they cancel each other. They have cannibalization effect. Retailers tend to one bigger and fewer promotions. All of them have done that pretty much. Therefore, it's very difficult to identify anything what so ever because the data contradicts itself. We have tried to identify sales volume by isolating depot as suppliers are given depot. So Tesco has twelve depots we will deliver to 5 depots. We will deliver the whole product range to one depot. So we try isolating depot looking at volumes year on year at looking at promotional volumes spikes. I will send the summary of what I have of the promotional performance. It's very brief page of conclusions and I did it with Andrew in fact. Promotions do have effect but it's very difficult to know which works best. Carrots have high penetration so lots of people buy lots of carrots. Therefore challenge for the Tesco or Waitrose is to get people buys people their carrots. There is a big potential how you can convert people when they are in the store.

**Sheraz:** why its the challenge?

Simon: if overall penetration in UK is 60 percent but Sainsbury penetration is only 40 percent why there is a different in percentage. Why any of the retailers is underperforming versus the overall potential's there is a theoretical potential. There are people coming through your door they can be your potential customer but why they are not buying it. So what promotional mechanic is most appropriate? They will probably say any promotional mechanic will do it. Whereas pasta is low penetration product people are not the generic people you have to be cooking expert. Some people are experts other are not. The

challenge is very different it's not about try to stop buying the carrot in ASDA to affluent in Tesco. It's about how you get people buy pastas at the first place.

**Sheraz:** The data tells which is the loyal customer where that customer lives, age, income level it should have made you life easy giving you complete picture of your consumer?

**Simon:** there are several issues yes whatever you are saying is absolutely logical however we are small companies so we tend not to have marketing team. But we have team of small people. Historically we were focused on farming. But carrots are low revenue items so If a Company turn over 40 million pounds and makes a 300,000 profits. The market share data for Dunnhumby is very expensive. So it's the resources, time and expertise is stopping you from using this data. And also Dunnhumby will tell you themselves that their promotional analysis is not very good. It does not tell you much. You cannot pick much out of it. Probably we are more advance from our competitors. We have taken expertise from Kent Business School we are looking in Dunnhumby in great detail. But we are finding it very difficult to come up with concrete conclusion about picking up particular promotions throughout the categories.

**Sheraz:** what are the profit margins on sales promotions?

**Simon:** zero or less than zero.

**Sheraz:** So why you do it?

**Simon:** because the retailers want to do it. The answer is that we are doing promotions very often. It drives our overall general volume. So you can offset the cost of promotions vs. the efficiencies from more volumes going through. So we are use to running these promotions all the times in the midst of what we do.

**Sheraz:** These frequent promotions are eroding your brand loyalty and brand quality. Sometimes you lose more then you gain. So your logic for using economics of scale for offsetting the losses is not supported.

**Simon:** that is true for branded products. Probably what I said was not correct we are not running promotions that frequently. We have stop doing that with Tesco. So whatever you are saying is correct. So we stop promoting so aggressively and so frequently and it has an effect. The key for us with respect to what the promotion is to get our product on promotion aisle end.

**Sheraz:** So is it the rate of sales that is important.

**Simon:** No, there is more to running a supermarket promotion then keeping customer happy. One of the reason of running a promotion is to tell the retailers that we are doing something for the sake of something. There is also a corporate strategy which says we should be doing some of this. Because, that's what we want to do. And we can make a big story out of that. Because it fits with the corporate story but what drives our volume is not the promotional mechanic but better position in the store. Carrots are stackable items. They are good quality, they are cheap, and they buy them regularly. What can make them buy more then. Because, they are regular item and not an impulse item. So if we put them on end. You are putting them in place. Where you can say ah they are carrots automatically. Other root vegetables it's much harder to do that but if you pass it on granola end. Its bigger uplift irrespective of what the promotion is. You can put them on same price and put them on end and on a pound. You sell them hell lot of more. Irrespective of what the mechanic is. Companies like Sainsbury, Tesco and ASDA have turn over the size of small countries.

**Sheraz:** what's the most challenging area in promotional execution?

**Simon:** I think the challenge for us really is to get more into the data. What is our research telling us? Can we be smarter and cleverer? And the real challenge is to convince the retailers to listen as what we are saying. There is some cynicism around data. When you have dunnhumby, a huge data mining company and there promotional analysis is not that good. what i have to say about the overall strategy. Price does drive volumes. Even in 2008. Waitrose was doing well but it was masked by the inflation. So they have to reduce the profits to be competitive. ASDA nearly went bust in 70's Archie came along and change the things. Drop the margins, drop the expectations and drop the price. That dramatically drove the volume. So high low pricing is out of fashion now. It's all about competitive pricing that is key to driving your volume. Retailers all look on Monday morning at each other retail prices and try to match it absolutely dead on. Even the premium retailers like M&S and Waitrose try to match thier key core lines. They are also pretty much like Tesco dictate the margin and price they will take. You hope from your volume and efficiency that you make money from that.

**Sheraz:** In other words you are looking towards your supply chain to be more responsive to give you the edge?

**Simon:** yes, so everything is driven by the price of the product. The general impression is that lots of promotions don't help you drive the business really. It's about everyday low pricing (EDLP).if you have to run a promotion its fewer promotions. Bigger deeper cut more and more align with the corporate theme. Therefore your promotion strategy tends to get dictated to you. If you want to do something else we have to be cleverer about what we do to convince somebody like Tesco. Retailers are built outside the towns. They are big stores out of town sites and they are finding less people coming through there doors. It's expensive to maintain these operations. If there are less people coming through the door you are under pressure because more people are shopping online. Its less about promotion end now and more about coupons. Clever, internet promoting.

**Sheraz:** yes but I try to check your foot print on the internet but your presence online is very negligible?

**Simon:** There is a reason for that for fresh produce and its more so now. Retailers are against branded product for fresh produce. All these retailers are adamant that they will sell own label fresh produce product. So it's about own label in fresh produce. Therefore it's pointless to have huntpac face book page. We already dealing with the retailers we can deal with. If we can find new customer that tends to be smaller. Caterings, independents, food services. So we are not interested in marketing. Because, everything is geared up towards retailers producing high volumes and high efficiency.

**Sheraz:** So why don't you promote on online site of retailers?

**Simon:** we do but its not very visible. Tesco for example if it's promoted on store they will promote on their website. But again whilst internet selling is growing very very fast. The sophistication for selling it online is not there. Its not sophisticated as you believe. When they run a promotion on store they try to replicate it on their website. There is also going on in terms of club card couponing, mail outs, check out coupons. As they have a corporate plan and they want you in so you don't promote online. Yeah, its waste of time and money.

**Sheraz:** If I ask you to convince Tesco that due to specific customer demand they should maintain the stocks would you like to do it and can you do it?

**Simon:** it's a tender process really. We are sole suppliers to Tesco express unless Tesco wants to make more money. So we have to put in ideas as how we can drive new ideas to drive express business. At the moment you are category managers and they will do the

retendering as well. Now it's become more important. I will try to look into that and trolling data. How we get smarter as how we promote to get our volumes better and get more customer to the category. Keeping more customer loyal. What we struggle to do is come up with concrete things. Dunnhumby tells you what's happening and what issues are but its does not tell what to do next? its store by store. But we can tell that look we are doing this research and this is what we need to do? We are doing a bit of work on low penetration stores. We have the complete list of lows and highs of the stores. What we can do is that we isolate the stores with low penetration and sent out other suppliers in the category to go and photograph the stock levels and then report back. We have found that there are three reasons for low penetration. One is the seasonal demand due to seaside location. There is heavy competition. There are two other categories one is unknown. Better management of the stock level. Third is unknown. There is no product on the shelf. It's a mess. It's just not doing the job. The fourth is unknown. You go in the store there is very less competition, there is lots of product on the shelf, and the store looks very very nice. The demographics are good around that store but the store is not selling around. Badly managed store we can do something about it. The fourth one is more difficult and more research. It's about the promotions it's targeting the areas and stores that underperform to boost in some kind of way. That could have effect on driving over the performance. The reason why we have not done it before it's very costly and produce is behind all the other areas. Its very farming, unsophisticated focused.

**Sheraz:** Your managers are the employees of the same company that have been promoted by virtue of their experience and they may not be marketing or supply chain experts?

**Simon:** that right. People are coming to know about Kent by accident and getting to grips with this. There is lots of cynicism within the produce. You spend a huge amount. We have to spend 600,000 pounds of Dunnhumby from our 200,000 profits. And what we get is one percent uplift in volumes. ROI has not been very good. We are very lucky to find Kent that is very useful for us. Lots of cynicism, higher turnover, low margins and low profit making companies. Farming focus retailers hasn't driven produce in this way up until now because they have not get the head around. It's easy for unilever where you can spend zillions on research. But there has been not focus on research and trusting the data. Is 1.4 million customer data. Its huge customer base.

**Sheraz:** is there any formal evaluation after the promotions?

**Simon:** only on an adhoc basis. The retailers will say look this promotion has worked. We will have a look and say ok. We have tried to do promotional evaluation but it comes back. The sophistication with which were doing is not good. Up until we got use to working with dunnhumby. The conclusion is yes promotion has worked but we don't know why and how.

**Sheraz:** Do you put in the feedback into the loop again?

**Simon:** yeah. You can do it along with big presentation like this and then they put it in the bin. That's the common theme with all the suppliers. That's a bit unfair. They will like to do it. it has just started recently. Produce with more so, in other areas is governed by corporate promotional strategy. What do you do for whole produce rather than the carrot or onions? We can try Dunnhumby and whatever we like really. But we have found very difficult to prove it has worked or not.

**Sheraz:** Is it possible if you allow us to run an experimental promotion to see its effect with all others onboard?

**Simon:** That will be very interesting. We have to gain buy in from Tesco. We have to pay for promotions to run the promotions. Off course we are interested in doing this. We are at a very early stage to learn about data and to manage it.

**Sheraz:** Thank you very much, simon for your time. Are there any questions or queries about this interview?

**Simon:** No, thank you very much.

**Sheraz:** The interview will be transcribed and will send a summary of the key points identified, for confirmation/clarification. Thank you


## Transcripts of interview with Darren (Fiddle Ford, mushrooms)

**Sheraz:** My name is sheraz and I am from Kent Business School. I am looking to learn the process of sales promotions in small and medium enterprise and food companies like you. The purpose is to gain practical understanding of the complete promotional cycle and to identify the potential areas for improvements, where the processes are either flawed or not consistent with current practices and to see the use of consumer information at various

stages of promotional cycle. As you are aware we have access to Tesco club card data. I wanted to know how that information can be better used in promotional cycle. For that I will give the brief introduction what a sales promotion is and then I will be asking certain specific question regarding your sales promotions in terms of setting of promotional objectives, planning, execution and feedback. I will request for specific answers for my better understanding. As per the literature Darren the definition of sales promotion is 'it's an action focused event whose purpose is to impact the behaviour of the customer either in long term or short term'. If I ask you what does sales promotions means to you as a company can you tell what your focus is while you are running promotions?

**Dareen:** Our key focus Sheraz while we do promotions is essentially to drive additional volume sales. It's the key. We want to run a promotion to increase the additional volume sales.

**Sheraz:** When you volume its only volume not value.

**Dareen:** Well it can be that but key bit for us most of the times are the increase in volume. Because obviously if we increase the volume we hope we will increase the value. Value is also important to us but lots of times it about driving the volumes. The secondary aim can be to add some value as well. If some promotions have not driven the value then we will not run it again. We sometimes have to try it to see how it works. To see its worth doing it again.

**Sheraz:** So how do you measure it? What's your yardstick?

**Dareen:** It will depend where it is located in the store. Obviously we promote at different location in the store. We either promote in fixture so we don't get any promotional space. Our yardstick have we increase the overall volume, our cost of total category. Have we sold more mushrooms and what effects on our profitability. How much cash we have? Sometimes you cannot take the line but consider category as a whole. Have we made more money on the category that week by doing that promotion? Yes or no. as well as increase in the volume.

**Sheraz:** Do you have short term goals or long term goals or it's only about increasing the volume?

**Dareen :** Obviously the key priority is short term. Long term is are we trying to get customer to buy more mushroom. That is lot difficult to work out and judge. What effect has

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promotions on driving sales overall longer term but we initially try to get is short term volume and hopefully profitability up in short term.

**Sheraz:** It's more of increasing the volume and not as much focus on increasing the value or the long term thing is not in your mind when you are running a promotion in your mind?

**Dareen:** Yeah, generally with the produce yes promotions are more short term because its own label. We have a different way of looking at the things as compared to brand competitors. Like for example if you are coke promoting you want people to buy your coke not Pepsi whereas in mushrooms own label Tesco we will not steal somebody else share.

**Sheraz:** But then you are also not bothered by increasing the repeat purchase or trial of the product?

**Dareen:** The only thing about mushroom is that it has got short shelf life of less than a week any way. People are buying them regularly every week. So you probably buy them any week anyway. That's the reason we want to people to buy more that week. They might buy two that week instead of one pack. They will not buy next week so they will be gone off next week. We hope they will buy four packs instead of 3 over that 3 weeks period as its on offer.

**Sheraz:** Your production capacity is huge 45 tons a week, so you are you concern about quantity itself?

**Dareen:** When we say it's an everyday product with such a short shelf life. If we can increase our volume it will make our overhead smaller. That's the key bit for us. As our overheads are fairly fix. We try to sell the product as much as we can.

**Sheraz:** What increasing the brand awareness, customer loyalty you are not concern about that. Usually when somebody promotes these are the offshoots of sales promotions. Are you mind of these goals as well while setting the promotional objectives?

**Dareen:** A little bit because we are own label product. We are trying people to buy mushrooms in Tesco rather than in ASDA. People are shopping various retailers each week. That's not everybody off course some people do but some people don't. We are trying to bring loyalty to customer but it's very difficult to monitor, Because mushroom is high penetration category anyway. It has got 60 plus penetration anyway. So we have lot of consumer buying them regularly anyway

**Sheraz:** So you are saying as you are less concern about the category or brand awareness thing?

**Dareen:** Yeah we are more focused on increasing the volume because we want to grow. Our product is low value high frequency product so if we run buy get one half price then we cannot grow. People will buy more as its offering something extra but then they may not come next week to buy it. So we are trying money off at retailers till. That is giving them 25 percent off. If a product is 1.25 then we give them for one pound to help us grow.

**Sheraz:** That's the reason you are more focused on the volume not the value?

**Dareen:** Yeah. Multi-buys don't help us achieve this.

**Sheraz:** So I can say when you run a promotion you are not interested in increase trail of the product but more interested in increasing the quantity of it?

**Dareen:** Yes, the nature of the product is as such that it favours this type of promotions. This is all down to mushrooms as it's a regular product, high penetration thing with short shelf life so, Yeah I will say I will be less concern about other things.

**Sheraz:** If I ask you do you have a specific promotional objective against a specific promotional mechanic (like for example BOGOF or half price)?

**Dareen:** no it's not written down, it's not that formal as it's an own label so we don't link any formal promotional objectives with mechanics. It's not that formal. Ok. If Tesco wants to run promotions they will tell us to contribute. So we have to do it, as this will help to overall value of the category to grow. Also as this is only one line. And it's not cannibalizing the other lines as well.

**Sheraz:** Retailers have the buying power so wield more influence in running these promotions?

**Dareen:** Yeah, Its group thing. They influence us for that as they are the buyer.

**Sheraz:** So you are an own label thing do you have any national brand competitors to compete with?

**Dareen:** No

**Sheraz:** so it is exclusively about category expansion while you do the promotions?

**Dareen:** Yes. That makes sense as you don't have a competitor so you are running promotions to increase the category by increasing the overall customer base.

**Sheraz:** so if ask you who is involved in setting of promotional objective as in literature it says it has four stages in promotional cycle first is setting of promotional objective, second is

making a plan, third is executing that plan and fourth is about evaluation and feedback. Who is involved?

**Dareen:** It's a mixture. 50 percent me and other fifty (production manager+ Tesco procurement)

**Sheraz:** What set of information is used to make that decision?

**Dareen:** We go to previous sales history of product both in terms of sales volume and value.

**Sheraz:** So you consider it while setting the promotional objective whereas you are less concern later to measure it only on sales volume?

**Dareen:** We don't go to Tesco to say we want to run this promotion. We are the second biggest supplier and the biggest get the priority. So Tesco force us into it by saying we will give you the part of the volume to them if you don't promote. That's the reason we are more focused on increasing the volume.

**Sheraz:** So sometimes this asymmetrical power shift forces you to make this decision not all the times the information itself?

**Dareen:** We have to be in business and we are here to make money so volume makes us make more of it.

**Sheraz:** So retailer telling you to run a promotion seems to me as passive of saying of you want to make money you have to run this promotions?

**Dareen:** It's a bit of a compromise. Sometimes they tell us what to do and sometimes we have to tell them that this cannot be done. So we listen to their request and sometimes they have to listen to ours.

**Sheraz:** If I ask you is it only the sales history of volume and value or any other set of information as well like your managerial judgment as well?

**Dareen:** It also depends on the time of the year. For example in summer the volume is lower so we have to run a promotion to push the volumes up at the same times we have to put overhead it over as well. Then in Christmas time the demand is low but we cannot promote as we know people will not buy it as they will be preparing other things.

**Sheraz:** So you do keep that seasonality in your mind while you are setting the objectives?

**Dareen:** It's not seasonal. This product has no seasonal appeal. It's a regular product. We do factor in this information of timings, consumer demand but majority is sales history of volume and value.

**Sheraz:** Now I will be moving to the planning phase from objectives. It's a stage where you make a detail road map to achieve those objectives. So what are the key variables in your planning phase?

**Dareen:** It's the amount of time. We need at least 8 weeks' notice to run a promotion. It's about sourcing and then producing it. We seek volume per week, volume per day. Especially it's about last three days of the week. It seems more of production thing.

**Sheraz:** can you please tell me more about stock management and distribution?

**Dareen:** All of these things form part of it. That includes labelling, pallet labelling, how long we are putting it in the distribution. As this is a pick to order product to so we have to be responsive. We have to deliver it in a very short time. Its lead time is very less. Therefore we need to have a rolling stock to manage it. And I am less concern about the stock management as it's a shorter lead time pick to order product.

**Sheraz:** So I have two questions now how much is your promotional waste and how much is your promotional stock?

**Dareen:** We are rarely out of stock. And we have very less waste. We have 4 sites and we manage our production in those sites and so if we are going out of stock we ramp up the production of one site and if we think we will be producing waste we reduce the production of some sites. So we avoid these situations by playing with the production of these sites. We also have additional supplier and they can be flexible as well.

**Sheraz:** But there has to be some sort of waste due to fresh produce?

**Dareen:** It can't be more than 5%.

**Sheraz:** If there is a waste how do you put into your planning phase?

**Dareen:** in our planning we hope to have enough stock and try to cover the fluctuations with the help of extra supplier. If it does not help we go to Tesco and tell them we will deliver a pallet less today and more tomorrow or vice versa. It's very rare they ask to send more pallets. If that's the situation then we will deliver less next day.

**Sheraz:** So who is your target customer?

**Dareen:** Its 35 down, middle age between 16-35 of Young families as it's a low end product so we hope they buy two packs with less than 35 years of age people and families.

**Sheraz:** Do you consider that in your planning phase that I have a young customer so I should plan my promotions by keeping in view their do's and don'ts?

**Dareen:** We do keep that in mind but not to that formal level.

**Sheraz:** How integrated are your processes for example production with the packaging and quality control?

**Dareen:** There are different parties working on all these sites. We have weekly meetings and we are in touch on the phone to tell each other about any changes. Everyone is involved into it, from production to the distribution.

**Sheraz:** So it doesn't look like there is a formal meeting for the sales promotions where all the stakeholders are assigned different tasks?

**Dareen:** Not really, it's not like we have a formal promotional planning meeting. We do talk to each other when there is change for example increasing the production or managing the pallets. We have weekly conference and all farmers are sitting there we discuss things.

**Sheraz:** If I again ask you about the source of information used during the sales promotions planning as it's a detail road map?

**Dareen:** It's the same previous sales history. The key bit for us is the forecasting. This helps to know the demand levels and so we adjust our production accordingly.

**Sheraz:** So how accurate is your forecast?

**Dareen:** It varies between 50-100%.

**Sheraz:** Did you consider the reasons for having such a huge variation in forecasting during your planning phase?

**Dareen:** Yes, we do factor in all the important issues and problems. We record each and every day. We know demand of each day and note it down. So we have a detail roadmap of the things. We know the demand levels. But the biggest problem was us is the weather, as this changes the demand level. It's fluctuating. The supply side issues can be that the size of the mushroom is not right as the mushrooms have to be of certain size to be picked up. If that are of not right size we may have to delay our orders. The shape of the mushroom in our language is called as chest nut. If we foresee surge in the demand we try to pick ahead. It can be a lorry or two extra depending on the demand level.

**Sheraz:** If I ask you if you had a choice hypothetically as your customer is 35 and below and then I should be managing my stock keeping in view the store level demand?

**Dareen:** As we are own label so virtually Tesco owns it for all stock management issues. We cannot tell them to stock them on this store or don't stock them on that store. We have no influence of that level of decision making.

**Sheraz:** If you would have influence of that decision would you like to have your product stocked in the store as per demand levels?

**Dareen:** Yes we will like to do that but being an own label and second tier supplier we cannot.

**Sheraz:** Do you have that set of information with you where you know where your target customer lives and what's the demand level in certain store?

**Dareen:** We do have quiet good information about our customer being sitting in headquarter. But being a small own label supplier we don't have the influence to do stock management store by store.

**Sheraz:** Have you ever thought of using that targeted approach of reaching to your customer?

**Dareen:** No. the level of information used during the planning phase is much aggregated and not disaggregated by demographics, age or income level?

**Sheraz:** No. if you would have known detail set of consumer demand information then you would reduce your waste?

**Dareen:** As it's a pick to order product so we have a very less waste. If the mushroom is not of the sufficient quality we can sell it into a secondary market labelled as low quality product. It work both ways. We may tell retailers that we cannot supply certain quantity on that day. Most of our products are used. But we don't factor these set of information while making a promotional planning decision. Tesco don't use this set of information for promotional planning. We are generally 99% time right. Things happen on time, volume levels are attained. We maintain a healthy rate of sales. But as this level of information is not set into the Tesco systems so we don't do it.

**Sheraz:** Do you have an expert to give you advice on that data that will inform your planning phase?

**Dareen:** Yes, we have lot of people in our headquarters who know this stuff. They are not using it specifically for promotional cycles. No.

**Sheraz:** so now I move to the implementation phase are the things worked as per planned or there are minor hiccups on the way?

**Dareen:** We are fairly accurate on our execution. We deliver on time, have a healthy volume boost and work with the depot to achieve our promotional objectives. Our understanding of the customer is also pretty accurate. Occasionally things go wrong on some day but we cover it the next day. It's minor. We have store allocation systems in Tesco. We are allotted three cases. We have to deliver three days worth of product. We deliver on Saturday, Sunday and Monday. We then wait for next order as we have a time lapse of 30-38 hours. We don't need to store it as its pick to order product.

**Sheraz:** It seems to me that most of your problems are on the retailers end not supply side. Do you have a robust supply chain system in place to cater for all these fluctuations? Can you give an example where supply chain was not right?

**Dareen:** There are minor hiccups all the times. As it's a short shelf life product. So sometimes the crop is not up to the scratch. So we have to move around the production of different sites. As it's a produce business so its 365 days a year work all day every day. But we can handle things with the flexibility of production and support of suppliers.

**Sheraz:** Did you consider that in your planning phase earlier?

**Dareen:** The key bit for us is really sales volume. Our services level, labelling and packaging are in line to our objectives. We have a link called Tesco connect which gives us the forecast and we can see things happening. So, if the orders are getting up we ramp up our production and if there is a problem in the demand, we deliver less. The weakest bit for us is the forecast and weather has a role to play in it. Not much can be done about it. But it's getting better we are moving from forecasting accuracy of 65-70 % to 95%.

**Sheraz:** So how do you dispose your promotional waste?

**Dareen:** If the mushroom is not up to the standard of the Tesco own label then we pack it into a low quality product and sell in into the secondary market at low price.

**Sheraz:** Do you put any financial figure to the cost of promotional waste?

**Dareen:** It's difficult. We have a fix overhead cost of a product and we focus on kilo per day as our target volume. Sometimes we do certain planning and then Tesco changes it. So it's not easy to give a figure. But the more we sell the more we save.

**Sheraz:** So what is the key bit in your implementation phase?

**Dareen:** For us it's about the volume and sales forecast has to be right to achieve that. Our whole process demand levels, labelling, packaging and distribution is all depend on it.

**Sheraz:** So if you would have planned it by using the targeted customer demand don't you think your waste would be less and more uplift?

**Dareen:** Yes, I agree.

**Sheraz:** How close is your implementation with the plan?

**Dareen:** It's around 95%.

**Sheraz:** So what are the strongest and the weakest area?

**Dareen:** We have very less control over the implementation process so it's not easy to highlight one as Tesco is practically managing that end. We do certain things and then they change it last minute.

**Sheraz:** So do you think it's fairly accurate?

**Dareen:** It's very different in fresh produce. We normally try to be as accurate as possible but we have less control over the whole process itself.

**Sheraz:** What's your problem area expect forecasting?

**Dareen:** No, it's the biggest issue. All other things are linked to it. There is a gap between the projected and actual forecast.

**Sheraz:** Now coming over to the last stage of promotional cycle is there any formal process of evaluation and feedback for the sales promotions?

**Dareen:** No, it's not formal. We see the overall volumes. We see if there is an increase, and based on that we judge it and its link to the overall profitability.

**Sheraz:** For price discounting you have to sacrifice your margins so what's your threshold to say that I cannot go further than that?

**Dareen:** It depends as we don't want to lose money by simply running promotions. We take into consideration ratio on return per kilo. That's our yardstick.

**Sheraz:** So what's the percentage profit on your promotions?

**Dareen:** Its 5%. We see our overheads and decide keeping in view that level of margin.

**Sheraz:** Does this informal evaluation feed into your process next time or not?

**Dareen:** Yes, it does indeed.

**Sheraz:** Do you consider mechanic by mechanic or its generic and what's the fluctuation? It's mechanic by mechanic.

**Sheraz:** Who is involved into the process?

**Dareen:** Its 50 percent me and other 50 percent procurement, production and technical. They sit in the head offices, two of them. They coordinate it with others.

**Sheraz:** Thank you very much, Dareen for your time. Are there any questions or queries about this interview?

**Dareen:** No, thank you very much.

**Sheraz:** The interview will be transcribed and will send a summary of the key points identified, for confirmation/clarification. Thank you.

## Ambient

## <u>Interview transcript (Border Fields Rapeseed Oil Company)</u>

**Sheraz:** My complete name is Sheraz alam malik and I am from Kent business school. I am doing PhD in supply chain management and marketing. My special focus is working on sales promotions of FMCG's of SME's. I am in the data collection phase where I am conducting the interviews for learning the sales promotions side of SME's. How marketing works in your firm? What type of promotions do you employ? What type of promotional mechanic you do to increase your market share? I want to learn the practical process of doing the sales promotions. I will be designing my simulation model based on the inputs from you. After learning the process I will be able to design a model which can optimize the sales promotions of your company size. This is my second interview for in this process. First, I will like to brief you about the definition of sales promotions. 'It's an action focused event whose purpose is to impact the consumer behaviour over short period of time'. If I ask you what does sales promotions mean to your business as a firm?

**Tilly:** It means a way of increasing sales and a way of increasing brand awareness.

**Sheraz:** Is it about volume or value?

**Tilly:** It's about volume.

**Sheraz:** what's your focus (short or long term)/

**Tilly:** The short term objective is increase in sales, people become more aware of the brand and long term objective is to retain those customers. Because we know that 75% of those buying on promotions are retained buyers. So we are constantly building that ladder. When sales will peak we will retain a percentage so that we will be starting from higher level next time we will start a promotion.

**Sheraz:** So you want to increase the customer base and customer loyalty as well.

**Tilly:** yes.

**Sheraz:** It's the combination of both these?

**Tilly:** Yes.

**Sheraz:** what's the impact of sales promotions on your business?

**Tilly:** We are now running the sales promotions for four years. We know roughly what uplift will be. We know the rate of sales. So we plan production beforehand. We know they have a buy in period before the product goes on promotions.

**Sheraz:** Do you also consider cost in your mind while running the promotions?

**Tilly:** yes. It's the whole thing that comes into play (supply side, production and demand side). We will only run a promotion we think we can afford to run. We know certain supermarket will charge a fee for running the promotions. That is probably built in when we take into considering the sales promotions. With other they don't charge a fee for that. Some run for longer period of time. ASDA like to run 13 week price promotions. Morrison's like 3 week promotions. It's also the timing of the promotions as well it's factored in and it's a full circle.

**Sheraz:** You have promotional calendar where you decide to run the promotions? **Tilly:** Yes. This period now through March time which supermarket will go on promotions. We build in holiday offers and online promotions. Its timetabled in.

**Sheraz:** so you cater all those factors into your mind while running a promotion.

**Tilly:** Yes.

**Sheraz:** In literature there are 4 stages of running sales promotions. Setting of objectives, plan, implementation and evaluation & feedback. Now I will be asking specific questions about these stages wise for exact information. Do you have any specific promotional objectives against distinct promotional mechanics? (For example for price promotions half price or buy one get one half price or competitions)

**Tilly:** During the course of years we have applied different mechanics and the shallow price cuts does not work for us. We retail at 3.99 and we have learnt that best mechanic is one pound off in retail. It's getting us enough for customer to pick it of the shelf. From financial point of view we don't want to go any further than that. The supermarket don't believe that people would buy BOGOF are not necessarily looking for litre of oils. So the mechanic we use repetitively is the pound off.

**Sheraz:** So you are using price promotions not non price promotions and you are very specific about it. In price promotions you only use one pound off. That is not half price promotions. When you say pound off works for you so what set of information were you using in your mind to say this.

**Tilly:** We did 50 pence off and the uplift was negligible. It was enough for the percentage. We checked that via sales volume to say this.

**Sheraz:** Did u ever link that specific promotional mechanic with the promotional segment? Did you ever considered a promotional mechanic with a specific customer segment?

**Tilly:** No. we don't have lot of insights other then Tesco data. We don't get the enough insights for other supermarkets.

**Sheraz:** Have you looked into Tesco one link and what did you find?

**Tilly:** Well it has been an ongoing relationship with Dunnhumby and KBS right since the beginning. So we have lot of information who the customer is.

**Sheraz:** So who is the customer for your one pound off promotions?

**Tilly:** We don't know who that is. We know the customer who buys our product She is older. She is a lady and fits into the older category.

**Sheraz:** What's the age bracket?

**Tilly:** Between 35-45.

**Sheraz:** So this is your target customer. Where did you have this insight?

**Tilly:** From Dunnhumby. There is a growing trend of people buying our product but it's still this age bracket female people.

**Sheraz:** What's the measure of success or failure of promotional objective?

**Tilly:** Sales volume.

**Sheraz:** Do you think it's the right measure?

**Tilly:** We know that we have got a retain sales and we know that we are the market leader. You see the peaks of on and off the promotions in this graph. We can sort of measure that.

**Sheraz:** Did you ever consider that the uplift you got in the promotions is offset by the dip in the sales after that?

**Tilly:** We always get 35% retain sales. We know large proportions of our shopper are triallest and we have some data kantar where we have a little bit of Sainsbury. The information given to us was about the trialist. There is quiet high percentage of trialist on promotions.

**Sheraz:** So you are saying you have 25 % loyal customers?

**Tilly:** yes

**Sheraz:** I was not able to find price promotions from your side? I even checked the social media for this and no clue?

**Tilly:** I think the reason for that is we are conscious of the fact that we only have 4 or 5 key customers. And knowing that those 4 or 5 multiples are highly competitive to each other. We don't want to advertise that we are one pound off in Sainsbury as this will piss off Tesco.

So actively promoting the price on the site is not our policy. Probably we don't want to annoy. All buyers have equal amount of promotional share.

**Sheraz:** This is your decision or your retailers say this.

**Tilly:** They don't tell this to do it but it's our decision.

**Sheraz:** In stores it's promoted in the form of marker but the practical position of your oil is not ideally located.

**Tilly:** Yes, people tell us that when people walk past the oil category they have 10-15 seconds of their time. They look very quickly for what they need. So we need to be standing out on shelf. The location of border field was not very visible. Because, it comes at a cost. Putting shelf markers on and moving product cost an absolute fortune. We are not in that position yet.

**Sheraz:** Who is  involved in setting up promotional objectives?

**Tilly:**  Me and only me.

**Sheraz:** You are the account manager?

**Tilly:**  Yes.

**Sheraz:** What information is used to set those promotional objectives?

**Tilly:** There is an element of we know it works, we have done it before. Gut feeling/. Experience of what happens in previous different stores. History of previous sales, the uplift in sales, the retain sales just do it on the whim; we have a lot of sales history data to look at. Historically there was less planning we will just fit them in whenever we get the chance to speak to buyer. Whereas now on an annual basis we know when this peak and troughs will generally occur. We think summer there is a drop in sales. In February there is a drop off. In May there is lot of PR. there is lot of work around the fields. The fields are all yellow. The press is all talking about it. So we keep promotions online those times.

**Sheraz:** So you keep seasonality in your mind.

**Tilly:** Yes, past promotional sales as well and your gut feeling as well and managerial judgment.

**Sheraz:** Now we move on to planning phase. We now have to plan the promotions as now you have to make a detail roadmap to achieve promotional objective? What are your key promotional variables in promotional planning?

**Tilly:** We do other things as well like competitions. We have holiday's plug into the calendar. We got press activities that factor in. Sales before Christmas.

**Sheraz:** You are talking about sales nothing about production distribution and quality control.

**Tilly:** This is because we have got a very good production system. We have the production capacity. We think about that. Historically production, packaging or distribution has not caused us any issue. We know we got systems in place. We are sure that it will not go wrong.

**Sheraz:** What is your capacity?

**Tilly:** What you try to do is that we don't want every promotions running in parallel at once. Sometime we end up due to timings of supermarket of running three promotions at once.

**Sheraz:** For these three to run you have to increase the capacity for that? How you cater for that? Do you have any matrix in place to put it in the planning phase?

**Tilly:** Yes we have an excel spread sheet that I forward at least four weeks in advance. Knowing that we need to have a buying period and there will be promotions running. I put in those figures which I need and production manager ensure that he has everything in place to see if she has all the resources. To need for what he need what i want him to make.

**Sheraz:** Do you formally have a meeting to discuss these things with all stakeholders like production, packaging and quality control?

**Tilly:** no, we don't sit down but we do speak every day. It's not like that now we have promotional planning meeting? No not like that. Not yet probably will come but not yet. In the computer system we have a file of our planning. I put in my figures. He has a plan. He has a complete production plan as he produce other things as well. **Sheraz:** How much is your safety stock?

**Tilly:** Last week we were tight but generally we have 2-3 week of safety stock. It has long shelf life. Somewhere, between 4 to 6 weeks stock.

**Sheraz:** Do you consider this fact while planning that you are running three parallel promotions and you have machines that cannot run more than 24 hrs. You must have capacity constrains?

**Tilly:** It's not an issue.

**Sheraz:** What I m learning from you is that there is absolute no issue in supply chain?

**Tilly:** No, there is no issue.

**Sheraz:** So you are saying your plan has never gone wrong in supply chain?

**Tilly:** No, its has not gone wrong.

**Sheraz:** How integrated the planning stakeholders are with each other?

**Tilly:** It's not close. We manage. We speak on the phone.

**Sheraz:** It seems like fire fighting?

**Tilly:** Yes, it is sometime reactive. Not proactive. But we try to manage it. Most of the times it works very well. It occasionally goes wrong.

**Sheraz:** What set of information you use to do detail promotional planning?

**Tilly:** We use sales data. We run supermarket competitions so we have data for those customers. We ask them details to enter. Where they live, thier email address, male or female. We have 10k customers but we don't use much of it.

**Sheraz:** You have a very rich database and you can make very informed decision making with that. It can be much targeted.

**Tilly:** It needs cleaning and we know that.

**Sheraz:** What type of information that database has?

**Tilly:** Postcode, and some data of their age. We have got database with the help of KBS students doing questionnaires and it's a detail database. So we have that.

**Sheraz:** So you have not used this data into the planning phase and design the whole process around it.

**Tilly:** No we have not. We have lot of tools but not enough time to use it.

**Sheraz:** Third stage is execution phase and literature says not everything that is plan goes.

**Tilly:** Yes.

**Sheraz:** Can you give me any example? in terms of promotions not but in terms of new products it does. So you don't do price promotion for new products to increase trial.

**Tilly:** No we generally put it on full price. We generally tend to put them in stores initially. and I think the rules of the supermarket is that there has to be a certain time period where the product has to be full price for certain period before it goes into promotions. We will put them on price promotions as soon as we can. This will help increase visibility and get them off the shelf.

**Sheraz:** Did your planning always have been right through out in terms of sales figure or production capacity?

**Tilly:** We have never fallen down.

**Sheraz:** Any minor hiccup?

**Tilly:** We do have in holiday's promotions where there was 7 nights stay and we thought it will generate huge interests and people will be applying to win that. Data collection from that is lower than weekend break in north. That's an extreme. But we have found applying different mechanics and competition. That sometimes it's not the biggest or the largest that is best increases the interest sometimes the feel that you are more likely to win a weekend break in this country.

**Sheraz:** How does it translated in sales and implementation issues?

**Tilly:** We were not measuring it on return in sales but with the return in tags.

**Sheraz:** But that less return has implications for your whole supply chain?

**Tilly:** We tend to run competition along with price promotions so it's entangled. So I don't know which of these things cause this effect.

**Sheraz:** So you have not considered that in your planning phase?

**Tilly:** No. we have run holidays purely on their own. The uplift has been ok if not that good.

**Sheraz:** if ask you specific questions if you were expecting some sort of uplift and it did not happen. There has to some sort of waste as its sitting on the shelf. How did it affect your supply chain?

**Tilly:** We have certain type of tags printed and we have certain timeline on that. So there is a throughput. We knew that competition will end on 31st sep. very early on if the sales are slow and we are not getting enough throughputs to stores. We will say let's not put 3000 tags on so we cannot get you through the store in-time.

**John:** The production capacity is enormous as compared to our ability to sell. So if we fail to sell 6 pallets in a month. The plant will stop working at an hour early. I suspect the way the production manager runs the shelf. And see if the number of pallets are piling up so he decides that he will run the plants for two days a week in that week. It's really not that tense and if it's less he can bump up straight away. It's so quick.

**Sheraz:** If there is an error at the end it will be amplified at the end.

**John:** No we can feed that up very quickly. The whip never gets serious. The moment it stocks up you stop it,Immediately. You stop working at 3 instead of 5.its like going on a car if you are going 120 mph and your route is only 30-40.

**Sheraz:** so you are saying it's a very safe bet and there is not much of the problem in the supply chain?

**John:** No, its not.

**Sheraz:** So can I say you don't have a promotional waste as such?

**Tilly:** No. rate of sales can be possibly slower then we should have anticipated it. It will never go to waste. The life cycle of the oil is as such that you are never going to get to that point where it's a promotional waste.

**Sheraz:** Did it ever happen that you went out of stock?

**Tilly:** No.

**Sheraz:** For example during an unexpected surge of demand you never anticipated  How do you manage that?

**Tilly:** We work with the consolidators. I can see how many pallets are sitting in Sainsbury depot. We look through store sales on the daily basis. So I can see what happened across the stores in Sainsbury yesterday. How many bottles we sold? How many pallets we have got in stock? We have to constantly manage that stock level.

**Sheraz:** But there has to have a lead time for that? Re-ordering takes some time and there has to have a process involve in it?

**Tilly:** Till the time I can manage those pallets in those 4 depots. I don't have a prob.

**Sheraz:** Did it ever happen you were close to out of stock?

**Tilly:** Yeah we have a close one.

**Sheraz:** Can you give me a typical example what happened?

**Tilly:** Sainsbury this last promotion will generally take 8-9 pallets a week on promotions. Then one day we end up ordering 4 pallets one day. Three pallets the next day, three pallets the next day and a pallet. So all of a sudden they have a huge surge of demand. On one day we have to deliver them one Saturday morning? Ok which the pallets go from here. Within the business we have the capacity to ship the oil. Because of the consolidator you are using? The consolidator was out of stock we put 12 and they have taken all of them. As we have to the capacity to deliver directly to the consolidator from this site. We could deliver in on

Saturday morning and deliver in. so before the next order comes at 11 we have pallets by ten past nine next day.

**Sheraz:** Then you would have given extra cost to labour does it adds up to the cost?

**Tilly:** No they work seven days a week. As it's a fresh vegetable business as well. So we have the advantage as they deliver 365 days of the year all day every day.

**Sheraz:** So your business model helps you as it covers your lead time?

**Tilly:** Yes this position we enjoy now previously we use to phone the pallet company and they can pick up at certain time and we can deliver at certain time. If we missed the slot it will go to the next day. We have this huge benefit because of that. Also we have an enormous production capacity.

**Sheraz:** That's way you are a business leader. You have a very short lead time in terms of producing it and packing it and putting that on that shelf.

**Tilly:** We are very lucky. You have got a robust supply chain. That the truth.

**Sheraz:** What were most critical things or area you considered most important while executing that promotion?

**Tilly:** It's everything it's a full circle and combination of all the factors. I have to plan that we have enough stock within the system; depot needs to have stock on their site by certain time. We need to make sure it's on the shelf.

**Sheraz:** What about seed?

**John:** This is an interesting question. The early issue I can say is for the capacity is the seed. We are very fussy about what seed we use. If, Tilly next year triples sales. There could be an issue.

**Sheraz:** So you plan 1 year in advance?

**Tilly:** No, 2 years.

**Sheraz:** So how you manage your harvest? There has to be the limitation of area. How you manage the seed, harvesting, the cycle itself?

**Tilly:** All of our growers are our stakeholders expect few that aren't so the communication is there.

**Sheraz:** it seems to be more of resource problem then a communication prob.

**Tilly:** so beginning of year at this time there will be a plan in place. So we grow in the certain areas of the country as well. it's in Scotland, north and this area as well. There is a plan in

place and that plan has promotions factored in. so our budget for next year has all the promotions plans as close as we can plugged in.

**Sheraz:** how much is the variation?

**Tilly:** It's different every time of the year. This time of last year we harvested one ton per acre seed. Next year it can be 2 ton per acre. It's the seed 9% moisture and it will be same for forever. If we over run it for next year we can always stock up. **Sheraz:** what's the shelf life of your seed?

**John:** Almost indefinite. We can sell the harvest we have got and we are very flexible in that. We are very lucky as well. As we have a big store where Tilly lives. Where they will look after our seed.

**Sheraz:** But what about the forecasting? Where the figure does comes in?

**Tilly:** We get the most up-to-date data which tells us the uplift along with the retain sales. Sometimes the probability of forecasting to go wrong is 10-20%? Yes. There are key stages from seed to the shelf.

**Sheraz:** What are the stages that can go wrong in the process?

**Tilly:** Different supermarkets have different mechanics. Sainsbury is very slick. We have got constant control and how fast due to system transparency. But with Morrison's there are some failings in their internal stock. They do vary. For me it's the stock that is setting in their consolidation depots has to be maintained and managed at a level. So that we cannot fail. Its all of that. There is not anyone of that you can say. The quality of seed is essential, the production capacity is essential, quality is essential.

**Sheraz:** So you cannot single out any process?

**Tilly:** To say it's any more critical than others. They are all critical.

**Sheraz:** Any problems areas?

**Tilly:** Keeping the farmers in line. Very difficult to manage shareholders. Sales is our biggest challenge. Things like unexpected surge are demand is difficult to manage. Unexpected consumer demand like the TV programme is slightly difficult to manage. For Price promotions what will be the uplift and we can tell that to production. They can see what we need. Unpredictable things like that caught you unaware.

**Sheraz:** So you are saying it's the buyer's side that can be challenging not your supply chain.

**Tilly:** No, up to the point where it goes to the consolidator where they can buy it there are not huge amount of issues that cannot be managed. There is a man in our company and he is very efficient for our supply chain.

**Sheraz:** So the last stage is that you sit around and see what went wrong and what went right? Do you do some sort of formal evaluation for that?

**Tilly:** No we are not very good at that. It's an area where we know we need to do more. We have got lot of tools and we know lot of things but we don't do a lot with it.

**Sheraz:** Is because of time or resource?

**Tilly:** A bit of both. We know it works and we can see it works. We have these kinds of figures that say yes we are doing the right thing. Yes we are getting the retain sales. It's not broken. But you don't have detail level of information feed into it. no.

**Sheraz:** hypothetically if you had a choice to see sales per store?

**Tilly:** we do have quite a bit of information and we know where we have pocket of good sales. We know York is a good area; Perth, Scotland is a good area. Our products sell good there. We haven't done anything with it. Mainly, because its difficult for supermarkets to have geographically close promotions. Some of our stores have national distribution but it's the big supermarkets not the conveyance stores. To say, Sainsbury to run this promotions there. We can't do it. They won't allow it to do it.

**Sheraz:** If they for example have given you the choice to run geographically close promotions will you do it?

**Tilly:** Yes. We have and we run press promotions. In Perth we knew that. We run a newspaper competition in that area to increase the rate of sales. But we can't do it in store. We try to give them an incentive to go into the stores and encourage them to buy. But we cannot manage the stock in the store. All of our stock in Scotland goes into one depot and then they distribute it. We have no control over the stock management.

**John:** I can imagine the value of the information for those stores where we don't stock. For example there are 50 stores in east London which information shows have magical sales for that category and then Tilly can convince buyer to stock its product there. We can spend money on it. The problem is we don't have that level of information except Tesco.

**Sheraz:** But you have not used that even?

**Tilly:** We are listed in Scotland and north of England but we don't know what is happening in other parts.

**Sheraz:** If you have a clear picture and you can convince your buyer logically that stock more in that store and stock less in these stores? You should come to our sales meeting. You haven't said that after that know it's difficult due to asymmetrical shift in buying power of retailers but you always convince them based on the information put an extra stock there.

**Sheraz:** Your oil is used as salad dressing and you can always do bundle promotions at Chinese year so that your products sells more at that time.

**Tilly:** Maybe we don't do enough of that. We have got the data but needs another life to study it. Yes, i think you need another person dedicated to give you advice on that. We are buying in this town.

**Sheraz:** Who is involved into evaluation process?

**Tilly:** We don't have an evaluation process. It is supposed to be me. Executives like to see sales going up and up. If we are making that ladder of sales then we are ok. It's very sophisticated.

**Sheraz:** Let me disagree with that if sales are going high the cost is also going high. There are many parallel promotions going on. The customer is very smart one day he is buy one brand on promotion and next day other. Sometimes running that frequent promotion is not the answer. It may quality perception problems. Have you ever considered these long term effects?

**Tilly:** Yes, we are starting to do fewer promotions and more PR. and other marketing mechanic. In last year we have heavily promoted. We know we are getting that retain sales we know it works we are building those blocks.

**Sheraz:** How do you define loyalty? Sometime targeted marketing helps more. You have a database of 10k customer. Did you ever think of approaching them directly? **Tilly:** We haven't done that. We are starting doing newsletters but we have not incentive to buy again.

**Sheraz:** Sometimes cost of retaining the customer is less and more profitable then getting new customer? Similarly for targeted marketing you don't need to promote frequently? Your focus should be greater profits not sales. Some volumes come at a cost. The profit margin for full price is better then price promotions?

**John:** Yes, but there is a bit of land grab going on. We want to get the market share. We don't want to do it at a loss but we want to be aggressive. Actually a lot of our competitors are bringing their price down.

**Sheraz:** You can get share from olive oil market by telling them health benefits?

**John:** Yes.

**Sheraz:** You are not communicating the health benefits even on doing competition. The difference can be in different ways. Being British, health and being local.

**Tilly:** Communicating health benefits to everybody in the UK is very expensive. We think we can do now. Until recently we have got the fire power. But on the other hand with the cap on the bottle its only 2p and you can convey the message. As discussed earlier customer has not more than 30 secs so if you have win on it then it's an incentive.

**Sheraz:** If you want to make an option with the olive oil customer to make a choice. Then health benefits should do it.

**Tilly:** yes. During the promotion we are starting to use the generic tags saying reduced fat, British flag. It's much more long term job.

**Sheraz:** what's the key problem? Is the communication with buyer? Especially now they are running their own brands.

**Tilly:** we tell them look we put money into the PR it will help the whole category. In return listen to us. What we say.

**Sheraz:** So will you consider stock management per store in negotiation?

**Tilly:** we know one producer will get two facing. Now they have started to listen to us. We are 1 or 2% of their sales. Tiny. 6 months ago its one brand.

**Sheraz:** Being small company you have the advantage of being dynamic and moving around. You can exploit that advantage to your benefit.

**Tilly:** Esp. when this category can really grow in next two years we need to make sure that we maintain that position whatever we need to do.

**Sheraz:** Thank you very much, Tilly and John for your time. Are there any questions or queries about this interview?

**Tilly:** No, thank you very much.

**Sheraz:** The interview will be transcribed and will send a summary of the key points identified, for confirmation/clarification. Thank you.

## Transcription of interview with Mr Lawrence (Hill farm, Rapeseed oil)

**Sheraz:** I formally welcome you (Lawrence) to this promotional research interview and thank you for your time. I am conducting this interview to learn the practical process of running supermarket sales promotions in a firm as a supplier/manufacturer. I want to understand the key promotional areas, problems on ground and its relevance with literature. Also, I want to learn how consumer information can be used in planning and execution process and its impact on supply chain. All information gathered will be in strictest confidence and will be shared with you.

I like to give a brief definition of sales promotions from literature its 'an action focused event whose purpose is to impact consumer behaviour in a short period of time'. What does promotions means for suppliers?

**Lawrence:** we want to change the consumer behaviour for a long term. Our product is a relatively new product on the shelf and we started pressing the oil in 2004. We have been supplying main multiples for 5 to 6 years. It's premium oil with relatively high priced. You can buy our 500ml rapeseed oil by £5. Whereas you can find 1 L bottle from £1.70 which is very cheap that's because of economics of scale. This enables them to do that at a very large scale. We are premium oil, we press the seed, we only extract 3/4 oil from seed in a cold press. We are selling a mini scale amount as compared to refinery. We are a new product and we compare our product to extra virgin olive oil from medeterianin countries. Olive oil is a house hold name. People use it for cooking. Rapeseed oil is new and it's not in the front of their mind when they go for shopping for salad dressing, cooking. We are trying to replace the olive oil with the British rapeseed oil. That is a long term process. we are trying to change consumer behaviour to say when go to buy oil don't buy olive oil, buy rapeseed oil.USP(unique selling point) for rapeseed oil is provenance, its British and it has nice story behind it. The farmer presses a seed on a farm and its still does. It's a family business in Suffolk and we grow our own crops, we press it ourselves. so the Provence is British, Suffolk and family farm. Other USP's are its health benefits, because it has very low saturated fat

(very good for keeping the cholesterol level down), it's rich in omega 3, 6, 9 and high in vitamin E. That is different then olive oil. Third is it versatility, it's a nice tasting oil, dress salad in it or dip things in it, it has a high smoke point (you can cook it safely) with respect to olive oil. Which when you heat changes its colour, you should not heat the olive oil as it changes the structure and it's dangerous. These are these three USP's we are trying to get across to the consumer. Not only from price promotions it's also via awareness promotions.

**Sheraz:** What are your specific promotional objectives? Like the one you have in Waitrose.

**Lawrence:** If I m doing price promotions and I have reduce the price of a product. I need to get increase sales coupled with increase in volume (not in its value).there are number of objectives with the price promotions. First, if I drop the price I should sell more volume as there is no reason for me dropping the price only for the sake of it. Secondly, as a result of increase volume people are buying my oil and I want them to come back.

**Sheraz:** In other words you want increase repeat purchase and loyalty.

**Lawrence:** It's a way of rewarding existing customer as well. That's a by product. You want them to become a loyal customer for your product.

**Sheraz:** During the course of literature it was learnt the promotional objectives of retailers and suppliers is different.

**Lawrence:** We wanted them to do brand switching as well. The immediate short term objective is to increase my volume a) to pay for my promotions b) to increase your customer base in long term. That's a bargain. When I first joined hill farm, I visited all super market we supply. We had a period of ten months of inactivity where no one was in my chair managing the business as result our sales were going downhill. Every supermarket buyer said hill farm is on our danger list. You have to maintain a rate of sales in the store to justify your position on the shelf. We have not been doing that and our rate of sale was down. The first thing I did to setup series of promotions. And part of that was to get my sales up. Part of it was to take existing sales from the other brand.

**Sheraz:** So you want to increase your market share as well?

**Lawrence:** Definitely yes, my short term strategy is to increase my volume of sales (I need to sell more litres of oil). I need to sell, sell and sell. I have to sell very quickly. I am selling 150,000 litres a year. I have to get it 500,000 litres per year. I am trying to sell rapeseed oil to manufacturers in bulk. We have got a quiet a degree of success in three months. On the

supermarket side its long term thing to bring in more customer.

**Sheraz:** So you are saying when you do promotions you look both ways (Short term and long term?)

**Lawrence:** yes

**Sheraz:** Do you have distinct promotional objectives for each type of promotions

(For example, for price promotions like half price or non price promotions like competitions)

**Lawrence:** not really. We are trying different promotions and seeing which one is working out or not.

**Sheraz:** Have you identified which one worked for you and which is not?

**Lawrence:** As I have not been in the company for long so can't say as I am 1 year behind. I am getting there for example magazine advertisement does not work. It's almost zero uplift (we are running a 70p off offer in Sainsbury magazine) we are getting an uplift of 15%.

**Sheraz:** Whereas the promotional uplift is in the range of 100-200%. The difference is so much. For different type of promotional mechanic effect is different for example half price promotion may encourage more to students with less money. Bundle promotions like buy one get one free is more for people with more storage facilities and better finances.

**Lawrence:** I have not run the bundle promotions so I can't say about its effect.

**Sheraz:** In your firm you don't link any specific promotional objective with specific promotional mechanic?

**Lawrence:** no, we don't.

**Sheraz:** How you measure promotional objective?

**Lawrence:** Change in sales before and after the promotions (3-4 weeks). It's very crude but this is the main criteria for this. In perishable category you have to plan promotions within 3-4 weeks of cutting the crops. This is done to move the volume fast. In that you want to increase consumption not the brand switching or repeat purchase.

**Sheraz:** So the promotional mechanic varies with the type of promotional mechanic applied along with the type of product. Who is your target customer?

**Lawrence:** Its affluent 45-65 years of age group of peoples and affluent young families with younger children (0-5 years).

**Sheraz:** Who sets the promotional objectives in your company?

**Lawrence:** Only I do that as we are a very small company. In my initial meeting with the

buyer I did ask them what in their opinion promotions will work? Retailers are onboard when you are running these promotions.

**Sheraz:** What is the source of information based on which you make decisions of running promotions?

**Lawrence:** At the moment, gut feeling and sales history. In 6 months time I have done all the analysis to know it.

**Sheraz:** Setting of Promotional objectives is the first stage of promotions. Now I move to planning phase and its impact on supply chain. What are the key variables while planning the promotions?

**Lawrence:** First thing are having we got enough seed? My seed has to last whole year.

**Sheraz:** who is involved in the production planning process?

**Lawrence:** All of them. For production, its production manager, business manager and operation manager. For distribution, its operation manager and business manager (me).For stock management, its operation manager and me. Packaging is done by operation manager and me. I am the overall manager of this process. Quality control applies to the bottle and run the bottling process.

**Sheraz:** How all these are integrated?

**Lawrence:** We all discuss it out during the meeting. It's a very integrated process. It can't work if anything is in isolation.

**Sheraz:** What is the source of information for promotional planning?

**Lawrence:** If I am planning for next year I look at the corporate plan of the supermarkets. Like Tesco has a clear corporate plan (1/3 off, half price promotions). I decide and then put those in. I see where the gaps and fill in with price promotions. There may be an event like Chinese year. It's a good time to promote and link it with Chinese product. I did take into account seasonal demand. For example, November is a slow month. I need to move the volume and keeps my turn over up. So I promote.

**Sheraz:** Do you think the cost of running promotions in your planning?

**Lawrence:** The cost of running the promotions can be offset by increasing the volume of sold oil.

**Sheraz:** After planning process it's about execution and literature says it's not only always how it's planned?

**Lawrence:** It's interesting a typical example is where I started a promotion and in the midway another promotion comes in (magazine 70p off). The minute the magazine is off. Another is awareness promotions. We are running many promotions continuously till the end of year. Packaging is part of passive promotions and that has worked and got uplift. Swingers are made on the bottle and they create a little bit of theatre around the bottle. You can do it for only 2 months otherwise the people will get bored of it. There is also a cap on the bottle with flag.

**Sheraz:** what went wrong?

**Lawrence:** They have corporate promotions (1/3 price off in Tesco). I asked for a good position in store and part in it. After sometime I was told that I can't be added in that corporate plan. That left a massive impact. Because of lead time of product, the impact was huge.

**Sheraz:** Have you ever considered this into your planning phase?

**Lawrence:** No, as I am new so this caught me out. I would not be caught out again

**Sheraz:** How it badly it impacted?

**Lawrence:** I lost 15 to 20% of my sales due to it. I lost 2 promotional slots.

**Sheraz:** why do you think it went wrong?

**Lawrence:** Its communication with the buyer which has to be right absolutely.

**Sheraz:** You are very focused in sending your promotional message to your buyer?

**Lawrence:** Yes.

**Sheraz:** so Implementation has nothing to do with hill farm?

**Lawrence:** As I have done that in our meeting so supply chain is not in my mind in implementation phase.

**Sheraz:** Does your supply chain never go wrong?

**Lawrence:** It does go wrong. It went wrong this week. We were in the middle of Waitrose promotions and in the start of buying in Tesco promotions, potentially the volumes for these weeks were very high but everyone was happy. Then there was a TV programme called 'harvest'. Wallace is the presenter he was looking at different types of oil for 8 minutes. He was talking about the virtues of rapeseed oil. He had tasting of different oils. People came out and started buying the oil in large quantities. It was all fantastic. Our sales in Tesco were 25% more than normal volume and Sainsbury was more than 50% of volume.

Overall there was increase of 30% in consumer demand due to his programme.

**Sheraz:** How did you manage it?

**Lawrence:** The orders were rushing it. I delayed other orders. I have to ring two non supermarket customers and delayed their orders to meet that demand. We got more people in to help us but limiting factor on production is the speed which we can press the oil. We are pressing 24 hr a day. It was not much we can do about it.

**Sheraz:** You can't see that in planning phase and implementation phase when it happened?

**Lawrence:** no

**Sheraz:** There was production limitation problem because of it and uncertain consumer demand presses your whole supply chain during that period of time?

**Lawrence:** yes. What I did to check it? I checked the sales volume and email all the stakeholder to tell them watch out as big shopping days (Thursday Friday and Saturday) were coming. The orders were rushing it. I delayed other orders.

**Sheraz:** Does it have any impact on distribution and packaging?

**Lawrence:** We use consolidator to do our distribution. Normally our orders are one or 2 pallets it was increase from 6 to 8 but no problems with it. We knew we were promoting with customer so we were having enough stock anyway. Packaging is fine. We order a year of packaging but we draw it as we need it. During the surge in demand as we are farming company we have a pool of people to work .I pull out people from other jobs which were not time critical.

**Sheraz:** what are your problems areas in implementation and why?

**Lawrence:** We have to meet that demand and we have no PR person at the moment. We will have a PR person and he will know when these programmes are coming. He will be looking into this side.

**Sheraz:** Do you have a waste during sales promotions?

**Lawrence:** No. we don't fill the warehouse with oil. We are always 4-5 days ahead of ourselves.

**Sheraz:** Do you think this safety stock is enough?

**Lawrence:** yes. We don't plan about the success or failure of sales promotions. I am keeping this thing in mind to say that next year I will be putting figure against all these promotions. This experience told you that I have to plan 1-1.5 yr ahead as crop has to be sown before

that.

**Sheraz:** How accurate is your estimates?

**Lawrence:** Funny enough for large crops it was 80%.

**Sheraz:** What is source of evaluating sales promotions?

**Lawrence:** The source of information is historical sales data and my own judgement into the promotional plan. I look into their growth rate of the retailers. I look at the product itself and how that product is growing. There are lot of factors going into it. It is the combination of judgment and historical data to make this decision. Last stage is after and before the sales promotion to see if it's successful or not. Once you do the promotions you tend to look to next one and next one. I don't put up here to say such promotions do such and such outcome. I should do. As I am planning for next year now I am now looking back after several months later.

**Sheraz:** It's not formal evaluation that is done after the promotions. If not, why?

**Lawrence:** I think it's because of time.

**Sheraz:** who is involved in evaluating sales promotions?

**Lawrence:** Only I am involved in this process.

**Sheraz:** What information you will take into consideration while measuring evaluation?

**Lawrence:** The change in sales.

**Sheraz:** If you receive a feedback do you share it?

**Lawrence:** I have not till yet but I will do that with the buyer and sit down with them. I will discuss my results with them to show that we have grown this much and this is why? They tend to sit there not listening. Only when talks of next year are they interested. The collaboration with the retailers and suppliers are not that ideal. This is down not to size but individuals and relationship. Communication is not very good. The problem with the retailers is that they have computer systems and everything is done in a system and given a feedback. So there is little communication about the process. I like to talk to my buyer. This is why I have put the promotions and why it's important? we do it the minute I make my proposal he should tell me you will not get through with this so that I should cater that in planning phase.(As this is so systemize that communication is missing). It's different in fresh produce.

**Sheraz:** Do you ever considering sending stocks to individual's stores as per the demand?

**Lawrence:** I am not involved in that level of decision making. We do get the data by store. We can see how every store is serving. You cannot do it. You cannot plan promotions by keeping that level of detail. No, we are in 500 different stores and I don't have the resource to do that. I would do it if I have time and resource. Even if I ask them they can't do that in Tesco they have buying groups. They have to do it by store group. The system does not allow it.

**Sheraz:** what's your promotional waste?

**Lawrence:** Our waste is zero (Even promotional waste). Very occasionally they damage the bottle. It's sitting on shelf and goes on.

**Sheraz:** Did you ever go out of stock during sales promotions?

**Lawrence:** Yes, that does happen. It is because the forecasting is not right. I suspect it's down to me especially when I am done to write it on form for Tesco. I should be forecasting a bigger uplift.

**Sheraz:** what is the source of information for forecasting?

**Lawrence:** They ask me and I look at historical sales and managerial judgment for that.

**Sheraz:** How often sales forecasting went wrong?

**Lawrence:** It happen once and more frequently in promotions. We never under deliver our product. I think I underestimated the uplift. If it was 250% I do it 200%. In their planning they plug this figure and error is amplified.

**Sheraz:** what is the process of managing out of stock?

**Lawrence:** The minute it goes out of stock. I pick up the phone to tell them. On the system it gives me average no of days of stock. Its 59 days of stock. When it goes to 30 or 20's, then I flag it up and tell stock control to have a look. They send me orders and we replenish that. We can do two parallel promotions but not three. We think we have safety stock. Some stores will be up and some not.

**Sheraz:** What's the process of re-order?

**Lawrence:** I will tell the production planning to watch out. They will do an extra pallet. If stores go out of stock this is the worst thing that can happen. You lose volume and you can see it in sales figure. It is lost sales and lost opportunity and you cannot afford being in small business.

**Sheraz:** Thank you very much, Lawrence for your time. Are there any questions or queries about this interview?

**Lawrence:** No, thank you very much.

**Sheraz:** The interview will be transcribed and will send a summary of the key points identified, for confirmation/clarification. Thank you.

# Retailers Transcripts

## Transcripts (Tesco buyer, store manager)

**Andrew:** Hello, we have designed a simulation and optimization model for stock allocation during promotions. He has done loads of the suppliers and wants to know the critical decision making during stock allocation to be right. The critical thing to understand is the allocation of stock to stores during promotions. The underlying thesis here is that promotions are not optimized because there is not an appropriate allocation of products to individual stores the demand in which is very heterogeneous. What we are saying is that if there are forty stores there is significant different response to each of those stores to any of the promotions. Our propositions is that in the depot and in the centre a decision is made in advance of promotions to say that this uplift is there so send this much to these stores. In this way some gets more others get less. So we have promotional waste occurring or we are getting missed sales occurring over there. What the simulation model does is that it takes into account weather, store type; we got upmarket store and price sensitive stores. And we are taking into account customer penetration. What we are saying is that demand in upmarket store where penetration is high and demand in price sensitive store where penetration is low is like this and the model will say that under these circumstances you should send this much stock to these stores. What we don't know is how it is initially allocated based on forecast, once a promotion is running who decides how much send coming to which stores. The nuts and bolts of the decision making of the model.

**Andy:** I understand the questions but I will not be able to answer in the similar way as we work in a different ways depending on the products. So products that have featured space like gondola ends or additional space will be better accommodated in terms of promotions

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stock. The products which don't and they have to be in the national promotions plan. We can get local products there but it's difficult like so products that are not brewed because of enough stock because we cannot get big enough reserve or stock in the depot because of the feature space thing. It's not about the percentage uplift that is put in its more about getting enough stock in the depot that go quickly enough.

**Andrew:** who decides what stock is to be put into the depot and what is the source of the information which decides this?

**Andy:** theoretically the buyer and supplier should agree what uplift goanna be to begin with the stock control team.

**Andrew:** do imagine it depends on what happened last time like this way?

**Andy:** Probably, I think it will be negotiated differently with different categories. There is no one way or set way of doing it.

**Andrew:** why Tesco don't have a mechanism?

**Andy:** Tesco may have a mechanism but the reality is that different.

**Andrew:** so like you and I negotiate that this promotions is coming up so in terms of how much will be sold will depend on the uplift two three times or five?

**Andy:** yeah that is my understanding.

**Andrew:** so this stock is ten it will be 15 or 20 or whatever?

**Andy:** yup.

**Andrew:** so you apply the uplift to all stores uniformly?

**Andy:** yeah. I think it is blanket for all the stores

**Andrew:** Do store managers have any say in what stock is coming in his way?

**Andy:** I can only speak for convenience but no. I can see the forecasted and have reasons for concern but I can only send an email and cannot influence the stock cover.

**Andrew:** does system has built into it minimum cover so if the stock is about to run out does it trigger for more?

**Andy:** yes till the time it will not use your reserve. So this is the minimum you must hold and if you are having a promotions then there is a cap on top of it. So the stock is two case instead of eight cases so theoretically we have x number of cases and we keep replenishing that until that has gone.

**Andrew:** so where is this reserve as you said theoretically?

**Andy:** at the start of promotions we agree with the suppliers that we will have these numbers of cases for it. So that's the number of cases so they ran out that's it.

**Andrew:** so if it ran out?

**Andy:** promotions over. So if this promotions runs good in one store and not another. They simply ran out. I don't know how to express it but at any stage you cannot amend your reserve, no.

**Andrew:** but where is this reserve physically?

**Andy:** it's in the supplier's depot.

**Andrew:** so you have 30,000 products and they all got reserves?

**Andy:** no, it's only key product must have not all promotions. As it's a standard line then it's a standard line all year round.

**Andrew:** this is reserve is not the safety stock

**Andy:** no

**Andrew:** but you deliver daily and then you don't need safety stock isn't?

**Andy:** depends on the space we have and how product is selling.

**Andrew:** so if demand is high in one store and have a successful promotions and all of my stock is finished so why can't I ask depot to send me more?

**Andy:** no it cannot. But as its a blanket cover .it should cover generally it does. As our stores aren't running out of stock everyday so the system is not broke.

**Andrew:** so you are saying it is not broke?

**Andy:** yeah but is there a better model yeah there is a better model. We will better off we do promotions by stores.

**Andrew:** under what circumstances you go and buy a fixed quantity instead of how much you need that. I don't understand that

**Andy:** we do a WIGIG? When it's gone its gone promotions. It's an internal Tesco term.

**Andrew:** why do you choose to do WIGIG? Is that stock hanging around the system or supplier has to say that i have a stock and will give a really good price. It may not be scheduled.

**Andy:** yeah but we will schedule it into promotional plan. Like Halloween a seasonal product.

**Andrew:** so its a fixed product and you agree with the suppliers that you make x amount of it. it's not like baked beans or beer.

**Andy:** yeah.

**Andrew:** so you are confirming that allocation of stock to stores is based on percentage uplift and it's applied universally to all stores. So in express store will get an increase same as an extra percentage wise. He sells 4 he gets 40 you get 8 he gets 80. So modelling bit says, that you sell more in one then other. Why you want to send the same to all. Is this how it works?

**Andy:** indeed.

**Andrew:** so what happens when you ran out of stock? For example the suppliers say that i cannot cope with the demand. How do you ration that?

**Andy:** we have a system if too much or too less comes in we smooth it again.

**Andrew:** again don't you think it's too universal?

**Andy:** yeah it's seasonal and it depends on the product

**Andrew:** but you don't have an algorithm which says that this promotional mechanic this much predicted uplift send this stock to this store.

**Andy:** not its not like that. We are send what will be sold and then at the end of the trading day what is left and how much is the lead time and how much should be delivered that day.

**Andrew:** but you have only limited stock available at the back of the stores. And you have two deliveries a day so you don't need a safety stock.

**Andy:** yeah it should be limited. Usually if there is a stock at the back it is due to the fact that its not been sold.

**Andrew:** so you don't have capacity issues from dept to the stores?

**Andy:** its not that difficult we can get our head around like if it's a Christmas period we start pushing big selling lines into the store early from two weeks time. So it's preloading the warehouses, big shops for faster moving lines.

**Andrew:** so there is no say of store managers as how much to send

**Andy:** yeah. They are told and buyer asks them if they are happy with the numbers. But its more on a gutt feeling.

**Andrew:** in theory we have gap scan so along with the universal allocation with the percentage uplift the system picks up that in these stores and tells you that send that much to fast selling stores and less to slow moving. Does the system adjusts to that

**Andy:** yeah, it adjusts to it almost immediately. As it's a sales based ordering system knows that

**Andrew:** who is penalized for the lost sales and do i need to write a cheque for that?

**Andy:** no, the system calculates what was expected to be sold and what is sold

**Andrew:** so we think if there is unsold stock you will have to bill the supplier

**Andy:** i don't think so only if there is an agreement. It is based on fixed ordering.

**Andrew:** so with ambient I don't think its an issue? But space is an issue but no penalty?

**Andy:** it hangs around in the warehouse. No

**Andrew:** so you would have space you would hold as much as you can?

**Andy:** no as it costs us money as there is a warehousing cost.

**Andrew:** so you are not incentivising for carrying extra stock rather less stock

**Andy:** no we don't penalize them for extra stock but it also depends on the agreement make earlier.

**Andrew:** so what happens to the un-sold stock?

**Andy:** it's the suppliers responsibility. But due to new regulation this is more of a collaborative thing. We have a central forecasting system build by a rocket scientist. So there is a system

**Andrew:** that system tells you that when you plug in that product for that promotion for that time of the year then this will be the uplift. Then it is allocated universally.

**Andy:** that's not true. It's based on the store profile, customer types along with the uplift. It more sophisticated. Then we negotiate with the buyer that do we need to buy a million now or after sometime.

**Andrew:** so it's not theory but real practice

**Andy:** yeah. It depends on the product type. For example for a carrot 18 weeks in advance I need to plant that for that promotion. On the other hand for mars if it doesn't sell we don't buy more in the middle of the promotions.

**Andrew:** so this is a risk you take as a buyer if the promotions don't go well. But at the same times we can get the relationship with the suppliers not right.

**Andy:** if want a product and the forecast of the supplier is not good and we ran out in the middle and get the supply from another supplier then next year that supplier will not get the

business. Also we sometimes use our own experience to forecast the demand and ask for it from supplier.

**Andrew:** so you are saying its your choice that you use the forecasting system or not. But the system is sophisticated. My next question is that why don't you use the system.

**Andy:** because of the time. For a local product we have 106 supplier we sit with them and do it in half an hour but for national brands we have only four. So we use forecasting system

**Andrew:** so you are saying its not been used by all the buyer all the time

**Andy:** it is probably used by the seventy percent for national buyers. If it goes wrong then I get twenty shelves complaining. Local lines go unnoticed. Meaning i have annoyed 20,000 customers.

**Andrew:** in the grand scheme of the things?

**Andy:** We have 20 million customers shopping with us every week.

**Andrew:** so you are saying that for other stores the system is too time consuming

**Andy:** yeah, I have got four meetings on that day; I have got emails to manage

**Andrew:** so do peoples in the system advise you that this is a commodity product and this much will be the uplift.

**Andy:** if I am a carrot buyer yes they tell me much is grown, this is the season so how much carrot will be flushed in. Like in four weeks time we will get the Holland carrots so there will be season for it lets do it Holland carrots. So the national buyer has their support with them. So in the commodity team there are forty peoples in them.

**Andrew:** so we are talking with the small food suppliers like huntpac, borderfiled so they don't have a clue what is forecasting. So they want to sit with the national buyers who aren't interested in local lines, right. For them it may not be the application of science as compared with the national brand.

**Andy:** absolutely, it works both ways. I have a buyer in the local team who has buyer a beer for Christmas. He has ordered five Lorries load of beer to go in Suffolk.

**Andrew:** on what basis then

**Andy:** this is the minimum amount they give on agreement.

**Andrew:** there is no science what so ever in this process? And how you calculate to send to stocks

**Andy:** yes. We divide the load by number of stores and give it to all stores.

**Andrew:** so you are saying that this is different for different suppliers. For national suppliers where brand is concern you do formal forecasting but for local suppliers it's not that sophisticated. For national brands you put into the rocket scientist forecasting system and its 95 percent good. For local suppliers with the long tail you don't do the formal thing because they are very small part of the whole business. So you allocate the stock based on the promotional uplift

**Andy:** I don't do it personally and do a bit of science in it. I will do sales precipitation. Take the sales of those groups of stores and manually allocate them. I will look into the spread sheet and then allocate the stock differently to different stores.

**Simon:** I will do it differently for different products. For example for carrot I will see how it is been selling today as it's a seasonal product for ambient I will look into the historical sales.

**Andrew:** do you take into account the weather?

**Simon:** to certain extend. Some products are sold in springs while others in winter.

**Andrew:** so it depends on the buyers experience so if you are relatively less experienced then you may not have a clue as what is happening.

**Simon:** yeah as you need to know the right number as for me this is my front game. I will challenge myself and look into the stock to say was it good or crazy.

**Andrew:** so for these four local suppliers will struggle more than the national brand suppliers with the unexpected surge of demand.

**Simon:** it depends on what type of agreement we have with the supplies is it fixed or re-ordering when needed. The system knows it. For example in Christmas we will ship large amount of stock once and when it's gone its gone. On other hand i will put it in the system and let stores pull to how much they want to pull it. it depends how it is displayed in the stores and how much stock is pulled when needed. It also depends on the geography of the stores. And demand around that stores

**Andrew**: so you set the system up as how it can behave? And have you done any top up purchase?

**Simon:** yes. I have only done two in last year. it's hard to get into the stores, the system is set up which don't allow us to go into the stores to buy a product. This is Tesco thing and local is not about spot purchase. It's getting recognized and not of turn over so it's national buyer's job.

**Andrew:** thanks