BAB 4

SIMPULAN

Pembahasan yang telah diuraikan pada bab sebelumnya, memberikan gambaran tentang pentingnya manajemen kategori dalam industri ritel sehingga dapat disimpulkan sebagai berikut:

Manajemen kategori memberikan manfaat yang besar bagi peritel. Pertama, memberikan kemudahan dalam perencanaan *merchandise* (maupun hal-hal yang berkaitan dalam pengkategorian, misal pemilihan perabotan) maupun *layout*. Yaitu akan mempermudah peritel untuk menyusun rencana *layout* toko dan penanganan arus konsumen di dalam toko hingga proses mengatur/penataan barnag dalam tiap gondola.

Kedua, dalam hal struktur organisasi toko akan lebih efektif. Peritel akan menjadikan struktur kategori sebagai rujukan bagi penyususnan struktur organisasi manajemen toko. Yaitu setiap tingkat kategori akan ditangani oleh personil tertentu sesuai dengan kemampuannya.

Yang terakhir adalah kemudahan bagi peritel itu sendiri dalam proses pengambilan keputusan yang strategis yang didasarkan pada kategori barang dagangan tersebut sehingga keputusan yang diimplementasikan benar-benar tepat sasaran.

Dalam mengimplementasikan *category* ini, peritel harus memahami betul komponen-komponen apa saja yang diperlukan. *Retailer* membuat sebuah sistem keragaman barang dagangan melalui klasifikasi barang secara diagram yang diciptakan dari foto, *output* komputer, atau gambaran arsitek yang menggambarkan secara tepat dimana *Stock Keeping Unit* (SKU) harus ditempatkan. SKU adalah sebutan untuk *item*/barang-barang yang dijual di toko.

Penting bagi *retailer* untuk menempatkan barang-barang di tempat yang tepat karena mengurangi *stack-out* yaitu barang-barang yang dipajang di lantai di depan rak utama. Pengelompokkan barang yang tepat maupun kelengkapan *assortment*, menjadi sebuah poin lebih yang akan semakin menunjang keputusan pembelian konsumen. Agar terciptanya susunan *merchandise assortment* yang diharapkan agar menunjang terciptanya keputusan pembelian oleh konsumen maka peritel harus melakukan proses penetapan dan pemeliharaan sistern klasifikasi barang secara hirarkis dan sistematis. Jika hal di atas tidak tercipta maka hasil akhirnya adalah konsumen akan mengurungkan niatnya untuk membeli. Namun sebaliknya, jika hal ini tercipta maka akan semakin menunjang keputusan pembelian dari konsumen dan akan menjadikan toko *retailer* sebagai tujuan berbelanja dan loyal untuk berbelanja di toko *retailer* tersebut.

27

DAFTAR KEPUSTAKAAN

- Amine A. dan Cadenat. S., (2003), *Efficient Retailer Assortment: A Consumer Choice Evaluation*, www.emeraldinsight.com.
- Asep ST Sujana, (2003), *Paradigma Baru Dalam Manajemen Ritel Modern*, Yogyakarta: Graha Ilmu.
- Barry Berman dan Joe R. Evans, (2004), *Retail Management: A Strategy Approach*, New Jersey: Prentice Hall.
- Ch. Whidya Utami, (2006), *Manajemen Ritel: Strategi Dan Implementasi Ritel Modern*, Jakarta: Salemba Empat.
- Levy, M., Weitz, B. A., (2001), *Retailing Management*, 4th ed., New York: McGraw-Hill Companies, Inc.

Ma'Ruf, Hendri., (2005), Jakarta : PT Gramedia Pustaka Utama.

Smaros .J., dan Hellstrom M., (2004), Using Assortment Forecasting Method To Enable Sales Force Involment In Forecasting, <u>www.emeraldinsight.com</u>. The Emerald Research Register for this journal is available at www.emeraldinsight.com/researchregister



IJPDLM 34,2

140

Using the assortment forecasting method to enable sales force involvement in forecasting

A case study

Johanna Småros Department of Industrial Engineering and Management, Helsinki University of Technology, Helsinki, Finland, and Markus Hellström

Candyking International Ltd, Helsinki, Finland

Keywords Sales forecasting, Confectionery, Process efficiency

Abstract The paper presents how a European pick-and-mix confectionery company has employed a new forecasting approach – assortment forecasting – to reduce significantly time spent on forecasting by working with an entire assortment at a time instead of producing a forecast for each product individually. The implementation of a less time-consuming forecasting method has enabled the company to involve its salespeople in forecasting and in this way gain access to their product and market knowledge. The case company's implementation of the new forecasting method is described and its forecasting accuracy and time spent on forecasting before and after the implementation are measured. The results demonstrate a remarkable increase in forecasting efficiency as well as improved communication within the company.

Introduction

Surveys examining corporate forecasting practices indicate continuing widespread use of judgmental and opinion-based forecasting methods in parallel with or even in preference to quantitative methods (Sparkes and McHugh, 1984; Herbig *et al.*, 1993; Sanders and Manrodt, 1994). In the context of estimating future sales, surveys conducted by, for example, Dalrymple (1988) and Peterson and Jun (1999) have demonstrated that judgment is the most important method of practical sales forecasting.

Although some researchers argue against the use of judgmental forecasting methods when statistical methods are available (Armstrong, 2001) and point out the risk of attaining biased results when using judgmental techniques (Makridakis, 1988), authors such as Basu and Schroeder (1977), Edmundson *et al.* (1988), and Fildes (1991) have shown that judgmental forecasts using contextual data can, in fact, be significantly more accurate than quantitative

ited The authors wish to thank Tekniikan Edistämissäätiö and Emil Aaltosen Säätiö for their financial support.



International Journal of Physical Distribution & Logistics Management Vol. 34 No. 2, 2004 pp. 140-157 & Emerald Group Publishing Limited 0960-0035 EVOI 10.1108/06000(2004)0528/32 forecasts. The importance of access to contextual information, such as knowledge of competitor activities, is highlighted by Webby and O'Connor (1996); based on a literature review, they conclude that access to contextual information appears to be the prime determinant of judgmental superiority over statistical methods.

Gaining access to contextual information when developing sales forecasts requires involvement of experts with market, product, and customer knowledge. Often these experts can be found in a company's sales and marketing departments (Reese, 2000). Involving sales and marketing people in forecasting is suggested not only to improve the quality of the sales forecast, but also to improve communication within the company and reduce the problem of every department working based on its own goals and forecasts (Fosnaught, 1999; Helms *et al.*, 2000).

Attaining sales force involvement in forecasting is, however, not easy. Many salespeople consider time spent on forecasting as time taken away from their real job of selling (Moon and Mentzer, 1999). There is a clear need for tools and methods that enable not only accurate, but also as quick and easy forecasting as possible.

In this paper, we use a case study approach to examine a new forecasting method – assortment forecasting – that has been proposed to support judgmental forecasting. The case company is a European pick-and-mix confectionery company that has recently implemented the assortment forecasting method with the aim of shifting forecasting responsibility from the company's purchasing function to its sales function.

The paper starts with a brief literature review. It continues by describing the methodology used. Next, the assortment forecasting approach and some results of its implementation at the case company are discussed. Finally, some conclusions and suggestions for further research are presented.

Literature review

Existing literature looks at sales force involvement in forecasting from several angles: the need for involving the sales and marketing departments in forecasting, organizational and motivational problems related to involving salespeople in forecasting, and guidelines for setting up a working forecasting process that utilizes input from a company's sales force.

The need for sales force involvement in forecasting

Although quantitative techniques are arguably very useful and often should be part of a company's forecasting process, they have certain weaknesses that can be counterbalanced by the use of qualitative forecasting. (Fulcher, 1998; Moon and Mentzer, 1999; Helms *et al.*, 2000). Quantitative time-series techniques are designed to identify and forecast trends and seasonal patterns in data and to adjust quickly to changes in these trends or patterns. Their limitation is that Assortment forecasting method

141

they do not consider contextual information, such as price changes (Mentzer and Schroeter, 1994). Regression analysis makes it possible to take such factors into consideration, but the complexity of the method and its significant data requirements limit its use (Lapide, 1999). Neither of the methods does well in dealing with changes that have never happened before, or that have happened before but for which no data exist in the system. This is where expert judgment can add significant value to the forecasting process. (Mentzer and Bienstock, 1998).

Situations in which expert judgment is needed include, in addition to the price changes mentioned above, assortment changes, promotions, competitor activities, and product introductions. The best information concerning these situations oftentimes resides with the company's marketing and sales personnel (Fulcher, 1998; Fosnaught, 1999; Moon and Mentzer, 1999; Helms *et al.*, 2000; Jain, 2000; Reese, 2000).

Achieving sales force involvement in forecasting

Although both researchers and practitioners seem to agree that sales force involvement in forecasting is important, benefiting from it in practice can be difficult. Several motivational, organizational, and tool-related obstacles have been identified.

In their in-depth study of the sales forecasting management practices at 33 companies, Moon and Mentzer (1999) found there to be some resistance from salespeople concerning their forecasting responsibilities in almost all of the companies studied. Many salespersons felt that it was not their job to forecast and that time spent on forecasting was time taken away from their real job of managing customer relationships and selling products and services. Similar observations have been reported by Helms *et al.* (2000) and Reese (2000). According to Reese (2000), these motivational problems are often aggravated by the lack of forecasting incentives; salespersons are seldom rewarded for producing accurate forecasts.

Moreover, Moon and Mentzer (1999) claim that even when companies get salespeople to forecast, they tend to do a relatively poor job. As they put it:

[...] even when the salespeople are provided with a history of their customers' demand patterns, they frequently will either see patterns that do not exist, or will fail to see patterns that do exist (Moon and Mentzer, 1999).

Based on their research, Moon and Mentzer (1999) have compiled a set of guidelines for overcoming the barriers that hinder companies from fully benefiting from sales force involvement in forecasting. They suggest that companies should:

• Make forecasting part of the salespeople's job by including forecasting as a part of their job descriptions, creating incentives for high performance in forecasting, and providing feedback and training.

142

34,2

IPDLM

- Minimize game playing by making forecasting accuracy an important outcome for salespeople and clearly separating sales quotas from forecasts.
- Keep it simple by asking salespeople only to adjust statistically generated forecasts rather than producing forecasts from scratch and by providing them with adequate tools that enable them to complete their forecasting work as efficiently as possible.
- Keep it focused by having the salespeople deal only with the products and customers that are truly important and where their input can significantly affect the company's supply chain.

The first two recommendations concern organizational and motivational factors, such as rewards, job descriptions, and training. The other two are about creating forecasting processes and tools that support sales force involvement by making forecasting simpler, more efficient, and more focused on the products and customers that really matter. These latter ones are the focus of this paper.

Methodology

We examine a new forecasting approach – assortment forecasting – presented by Holmström (1998). The approach has been designed to support judgmental forecasting and make it more efficient. Instead of producing a sales forecast for each product individually, the approach is based on working with an entire product range, an assortment, and adjusting the products' relative positions within this assortment. The product level sales forecasts are then derived based on the products' estimated positions within the assortment. (We will present the approach in more detail in a later section.)

When introducing the assortment forecasting method, Holmström (1998) also presented some initial test results. However, since the results were somewhat mixed and not derived from an actual forecasting situation, the practical applicability of the suggested forecasting method is still unknown.

The aim of this study is to further examine the usefulness of the assortment forecasting method and to answer the following research question: "Can the assortment forecasting approach be employed to facilitate successful sales force involvement in forecasting?". The research is, thus, hypothesis testing in nature, a research design that, for example, Mentzer and Kahn (1995) strongly encourage.

The research follows a case study approach. The first known actual implementation of the assortment forecasting is documented, and the resulting impact on the case company's forecasting performance is measured.

Case company

The case company operates in several European countries and is represented by a regional business unit in each of its markets. The company's business Assortment forecasting method model is to provide supermarkets, video rentals, cinemas and the like with a broad assortment of pick-and-mix sweets from several confectionery suppliers. The company also provides its customers with in-store display equipment and merchandising services, i.e. it runs the entire pick-and-mix category on behalf of its customers.

The company works with an assortment consisting of some 200 different products. The assortment is very dynamic. New products are frequently introduced and old ones delisted. In addition, campaigns and seasons introduce fluctuations in demand.

Traditionally, the company's sales forecasts have been developed by the regional business units' purchasing departments to support their own purchasing decisions. Although the purchasing departments have done a good job, the lack of sales force involvement has caused noticeable problems. Poor communication between sales and purchasing has, for example, resulted in last minute deliveries when purchasing has been taken by surprise by unexpected product introductions. Similarly, late information concerning product delistings or campaigns has occasionally caused inventory management problems such as excess stock or stock-outs.

Although shifting the forecasting responsibility from purchasing to sales has been identified as a key improvement opportunity, the lack of suitable tools to support sales force involvement in forecasting has hindered development. Since the sales people do not, in general, have any experience of forecasting and have very limited time to spend on producing the forecast, the forecasting tools and the whole process should be very easy and quick to use. The company's traditional forecasting tools and methods have not been able to provide the necessary support.

In 2000, the company heard of the assortment forecasting approach. The same year, it conducted some initial data analyses and tests, which produced promising results, and concluded that the new forecasting approach presented an opportunity to streamline forecasting and shift the forecasting responsibility from purchasing to sales. In 2001, a spreadsheet tool supporting the new forecasting approach was developed and tested. The first actual implementation took place in January 2002, when the sales force of the company's Swedish business unit started using the new forecast approach for producing sales forecasts. The company is currently expanding the use of the new forecasting approach to its other markets as well.

Data collection and analysis

Information about how the assortment forecasting approach was implemented at the case company was attained by interviewing the company's logistics manager, who supervised the entire development process from initial tests and tool development to actual implementation. The logistics manager was interviewed on several occasions during the years 2000-2003.

144

34,2

IJPDLM

In addition to the interviews, quantitative analyses examining the impact of the new forecasting approach on the case company's forecasting accuracy as well as the time spent on forecasting were conducted. These two performance measures were selected as they reflect the objectives of the company: to increase its forecasting efficiency by reducing time spent on forecasting and to increase its forecast accuracy by eliminating the problems caused by poor communication.

The company's forecast accuracy was calculated by comparing forecasts developed four weeks in advance with the actual realized sales. The forecast accuracy before and after the implementation was measured in order to evaluate the impact of the new forecasting approach. The forecast and sales information was extracted from the company's enterprise resource planning (ERP) system.

The change in workload was calculated using estimates from the purchasing department who produced the forecasts before the implementation of the new forecasting approach and comparing them to estimates received from the sales personnel producing the forecasts after the implementation.

Access to information on the implementation and to the forecast performance data needed for the analyses was volunteered by the company. Due to the researcher's prior knowledge of the assortment forecasting method as well as her position as an "outsider", the company considered her a suitable observer, capable of producing an unbiased assessment of the implementation of the forecasting approach.

The assortment forecasting method

The solution implemented by the case company builds on Holmström's (1998) original idea, but has been slightly adapted to better suit the company's needs.

The original idea

Holmström (1998) argues that traditional forecasting methods often are inefficient since the same forecasting operation – be it a time series calculation or expert judgment – needs to be repeated for each product separately. When there are many products and the forecasting process includes qualitative elements, this often means that forecasting requires much time and feels tedious. As an alternative, Holmström promotes the idea of working with an entire product range – an assortment of products catering to the same customer need – at a time.

The suggested forecasting approach consists of the following steps:

- (1) Estimate ranks for products within the assortment, i.e. put them in ascending order based on their expected unit sales.
- (2) Estimate the assortment's total unit sales.
- (3) Use a scaling function to divide the assortment's total unit sales between the individual products based on their ranks.

Assortment forecasting method According to Holmström (1998), the value of the assortment forecasting method is based on taking advantage of the fact that it is easier to forecast the total sales of an assortment than the sales of each individual product. The method also enables sales and marketing people to give input in a format, product ranks, which is convenient and fits their way of thinking. When changing the ranks of selected products within the assortment, ranks and, thus, forecasts are automatically adjusted for the other products, as well. If, for example, the forecaster decides to change a product's rank from seventh to third in the assortment, the product's forecasted share of total assortment sales will automatically be increased, while the ranks of the products previously ranked third to sixth will be decreased, causing their forecasted shares to decrease. This means that product dependencies and cannibalisation effects (Cadeaux, 1997; Safavi, 2000) are taken care of automatically. This makes it possible to focus on the most relevant products, the top sellers, and the most important events, such as campaigns and new products introductions, and in this way speed up the forecasting process.

As Holmström (1998) points out, the most critical part of the assortment forecasting method, and a key factor affecting its applicability, is the scaling function used to model the relationship between the products' ranks and their share of total assortment sales. Selecting the appropriate scaling function can be difficult. In his article, Holmström (1998) suggests that a logarithmic function of the following form be used:

Share (rank) =
$$\frac{1}{(rank + constant)^{1+power}}$$
. (1)

The relative weight of the higher ranks can be increased by decreasing the constant or increasing the power.

The scaling function would typically be calculated based on an assortment's historical sales data, but according to Holmström (1998) it may be necessary to make judgment-based changes to the function. As an example, he presents a real-life situation where an assortment's second most selling article was removed, altering the sales distribution of the entire assortment. To produce accurate forecasts, the salespeople would, therefore, have needed to forecast total assortment sales, product ranks, as well as the shape of the scaling function.

The case company's approach

When the case company first got interested in the assortment forecasting method, it did some data analyses to examine what the sales distribution of its assortment looked like. By analysing historical sales data, the case company noticed that a relationship between the product ranks and their shares of total assortment sales could be identified. In addition, despite varying total sales, product changes, and shifting popularity of the individual products (Figure 1), the relationship, i.e. the scaling function, looked rather similar from week to

146

34,2

IJPDLM



week (see Figure 2). The idea of using a scaling function to divide total assortment sales between the individual products was thus supported by the company's sales data.

The company first tried to use a logarithmic function to model the relationship between product rank and share of total sales, as suggested by Holmström (1998). This approximation, however, introduced a significant error. The logarithmic function simply did not correspond accurately enough with the actual distribution.



Figure 2. The assortment's sales distribution is rather stable despite varying total sales of example weeks

IJPDLM 34,2	The company, therefore, decided to try a different approach and use a historical sales distribution as the scaling function. The scaling function was formed by calculating the average shares corresponding to different product ranks over a period of several randomly selected weeks. The historical distribution was then
148	 tested and, as it worked well, selected to be the scaling function. After identifying a suitable scaling function, the company started testing the approach in practice. After several steps of trial and error, the company's current forecasting process emerged:
	 Load sales and forecast data from the company's ERP system into the spreadsheet tool.
	(2) Delist products that will be removed from the assortment.
	(3) Update product ranks: start with top-selling products and move downwards, focus on most important products and changes. Use products' historical ranks as an aid.
	(4) Add and rank new products.
	(5) Select the scaling function. (Although it is possible to select different scaling functions, in practice usually the same one is always used.)
	(6) Estimate total assortment sales.
	(7) Use the tool to calculate product level sales forecasts and load the forecast data into the ERP system.
	The first step is very simple: the forecaster, i.e. the salesperson, just clicks on a button and all the necessary background information – realized sales and previous forecasts – are loaded from the company's ERP system into the

spreadsheet used for forecasting. Steps 2-4 concern the products' ranks. The salesperson first delists the products that will be removed from the assortment. Next he updates product ranks, starting with the top selling products and moving downwards. To make it easier to accurately estimate the ranks, the spreadsheet tool displays each product's ranks for three historical weeks selected by the user, as well as the average rank of the product during these weeks. The salesperson can, for example, select three fairly recent weeks to look for potential trends in a product's demand or look at last year's ranks to examine seasonal factors. Finally, new products are added and ranked.

When the ranking has been completed, it is time for Step 5, selecting the scaling function. The user can choose a predefined scaling function or he can create a new function based on the historical sales of a selected period, for example, Easter or Halloween. In practice, however, the salesperson currently only uses one predefined scaling function, which has been found to be fairly accurate and is regularly updated based on historical data. In step 6, the total weekly sales of the entire assortment are forecasted.

When all the necessary information has been inputted, the spreadsheet tool calculates the actual product level sales forecasts, which are then loaded into the ERP system.

The sales function at the Swedish business unit develops product level forecasts for a rolling 52 weeks each month. Although the forecast period is one year, greater emphasis is placed on the upcoming months than on the long term forecast. If new information regarding, for example, promotions is attained, forecasts can be updated more frequently.

Implementation results

Next, we will examine how the implementation of the assortment forecasting method at the case company's Swedish business unit has affected its forecasting performance and time spent on forecasting.

Time spent on forecasting

When introducing the new forecasting approach, the main objective of the case company was to shift the forecasting responsibility from its regional purchasing functions to its sales functions, where important business decisions concerning assortment changes and campaigns are made. However, to enable the shift, forecasting had to be made much simpler and quicker than it had previously been. Otherwise, the sales force would have neither the time nor the interest to forecast.

Before the implementation of the new forecasting method, it took the purchaser of the case company's Swedish business unit between one-and-a-half and two days per month to create the forecasts. The forecasts were developed product by product for a rolling 52 weeks on a monthly basis in the company's ERP system.

After the implementation of the assortment forecasting approach, time spent on forecasting has dropped to an average of two hours per month, although the salesperson producing the forecasts has no previous experience of forecasting. This means that forecasting only takes a small fraction of the salesperson's time, letting him concentrate on his main job – selling – the rest of the time.

The entire efficiency improvement cannot be credited to the new forecasting approach alone. Part of the improvement, corresponding to a few hours of work, is a result of replacing the inflexible ERP tool with a user-friendlier spreadsheet tool. However, the bulk of the improvement clearly comes from the opportunity of working with the entire assortment at the same time, focusing on products and events that really matter and spending very little time on the less important products.

Impact on forecast accuracy

In order to evaluate the Swedish business unit's forecast accuracy before and after the implementation two measures were used: the weekly mean absolute percentage error (MAPE) and the median absolute percentage error (MdAPE)

Assortment forecasting method

149

of product specific forecasts developed four weeks in advance. The absolute percentage error (APE) is calculated by dividing the absolute difference between a product's forecast and actual sales with the product's actual sales. The MAPE is the most commonly used sales forecast performance measure (Kahn, 1998) and is calculated by taking the weekly mean of the product specific APEs. The MdAPE is calculated by taking the weekly median of the product specific APEs, i.e. leaving out the best and the worst weekly forecasts.

The forecasting accuracy of the Swedish business unit was satisfactory already before the implementation of the new forecasting method. The main target of the company was to improve communication of special events, such as product introductions and campaigns, by shifting the forecasting responsibility from purchasing to sales. In fact, there were some worries that the overall forecasting accuracy would drop as the forecasting responsibility was given to a person with no previous forecasting experience.

When comparing the Swedish business unit's forecasting performance before the implementation (weeks 8 to 48 in 2001) and after the implementation (weeks 8 to 48 in 2002) no obvious change in forecast accuracy could be detected. The MdAPE decreased from 29 per cent to 22 per cent, whereas the MAPE increased from 103 per cent to 137 per cent (Table I).

There is a notable difference between the MdAPE and the MAPE. There are two reasons for this. First, since the company's assortment includes a lot of small products for which the weekly variation in sales can be significant, sometimes extremely large forecast errors, even over 1,000 per cent, occur. These errors have a significant impact on the MAPE, although they do not affect the company's operations in practice. Second, two seasons – Easter and Halloween – are notoriously difficult to forecast and have a significant impact on the MAPE as can be seen in Figure 3.

Shift in responsibility reducing communication lead time

The main reason why the confectionery company wanted to involve its sales force in forecasting was that it hoped that this would improve the communication between sales and purchasing and ensure that information on such events as product introductions and campaigns would be passed on more efficiently than before.

When talking to company representatives, it seems that the goal of increased communication has been achieved at the Swedish business unit, although not fully. According to the logistics manager of the company, sales are now

Forecast error before		MdAPE durit	MAPE during period		
and after the	Period	Average (%)	SD (%)	Average (%)	SD (%)
implementation of the new forecasting	Weeks 8-48, 2001	29	37	103	207
approach	Weeks 8-48, 2002	22	14	137	137

150

34,2

IJPDLM



increasingly committed to availability and the communication gaps have been reduced.

Quantitative measurement of the change in communication efficiency is difficult. In this case, product introductions were monitored. The proportion of product introductions for which a forecast had been inputted into the ERP system on time (i.e. for which a forecast had been inputted into the ERP system at least four weeks before the product was introduced) before and after the implementation was calculated. The proportion of on-time forecasts was 33 per cent before the implementation and 54 per cent after the implementation (Table II), despite a significantly larger number of introductions in the latter period.

Analysis of forecast accuracy

Next, we will examine the forecast accuracy in somewhat more detail. We look at the three main components of the assortment forecast approach – product ranks, total sales, and the scaling function – and examine the accuracy of each of these components.

The first component of the assortment forecasting is the ranking of the products. The rank error was calculated by comparing each product's forecasted rank to its actual rank and taking the absolute value of this

	Proportion in 2001 ^a	Proportion in 2002 ^b	Table II.
	(%)	(%)	Timeliness of forecasts
Forecast on time Forecast delayed by one-two weeks Forecast delayed by three weeks or more	33 33 33	54 23 23	for product introductions before and after the implementation of the
Notes: ^a Total amount of product introductio	ns during weeks 8 to 48 in 2	2001: 12; ^b Total amount	assortment forecasting
of product introductions during weeks 8 to 4	8 in 2002: 52		approach

IJPDLM 34,2	difference. On average, the absolute rank error of the 20 best selling products was 3.2 positions. For the top 50 products the average rank error was 4.9
	Based on the results, it can be concluded that there is some room for
	improvement as far as the top 20 products are concerned, but that the general
152	accuracy is good.

The second component of the assortment forecasting approach is estimating total assortment sales. During weeks 8 to 48 in 2002, i.e. after the implementation of the new forecasting approach, the MAPE of estimated total assortment sales was 16 per cent, despite significantly fluctuating sales (Figure 4). This must be considered a good achievement.

The third and final component of the assortment forecasting approach is the scaling function used to link product ranks with shares of total sales. In Figure 5, the actual weekly sales distributions for weeks 8 to 48 in 2002 and the distribution used for producing the forecasts, i.e. the scaling function, are presented. As can be seen, the estimated distribution is quite close to the realized distributions. There is only one exception; week 48 has quite a different distribution than the other weeks. The top selling product this week stands for





more than 4.5 per cent of total sales, whereas the top seller usually represents between 2.75 per cent and 3.25 per cent of total sales. According to the logistics manager, the most likely reason for this unusual sales distribution is supply problems for one or more high-volume products. The unusual sales distribution has undoubtedly affected the forecast accuracy that week.

Conclusions

The objective of the research was to examine whether the assortment forecasting approach could be employed to facilitate successful sales force involvement in forecasting. Based on studying the implementation of assortment forecasting at the Swedish business unit of a European pick-and-mix confectionery company, the answer is yes. The implementation of the new forecasting approach has significantly increased forecasting efficiency and, in this way, enabled a shift of forecasting responsibility from the company's purchasing function to its sales function.

Benefits of the assortment forecasting method

In his article, Holmström (1998) attributed three major strengths to the assortment forecasting method. First, he argued that the method's top-down approach would enable it to take advantage of the typically very high accuracy of estimates of total sales. Second, he maintained that adjusting forecasts by updating product ranks would enable sales and marketing people to give input in a format that is more convenient and fits their way of thinking. Third, the assortment forecasting method should increase forecasting efficiency by allowing the forecaster to focus on the essential products and events.

The results of the case study support these propositions. Despite significant weekly variation in total assortment sales, the business unit's salespeople were

able to produce accurate estimates on the aggregate level. This supports the ideas presented by Holmström (1998) as well as other researchers (Plossl, 1973; Muir, 1979) that estimating total product group sales is easier than estimating sales of individual products. In addition, based on the results of the case study, updating forecasts by adjusting product ranks seems to work well. The product rank accuracy was in general good, although there was some room for improvement in the top 20 products. Furthermore, Holmström's (1998) suggestion that working with an entire assortment at a time and focusing on the most important products and events could increase forecasting efficiency was clearly validated. The implementation of the new forecasting method resulted in a striking reduction in the time spent on forecasting.

In his article, Holmström (1998) identifies the scaling function, i.e. the function modelling the relationship between a product's rank and its share of total assortment sales, as the weak point of the assortment forecasting method. However, in this case, the relationship between rank and share was very stable and, thus, easy to model, despite varying sales and a dynamic assortment.

Limitations of the assortment forecasting method

The results of employing the assortment forecasting method in the case company's Swedish business unit can be considered very promising. However, to be able to evaluate the generalisability of the results, the business context in which they have been attained needs to be discussed. Several characteristics of the Swedish business unit's situation make it a particularly attractive candidate for assortment forecasting and present potential limitations for its applicability in other business settings.

First, the business unit's assortment is very dynamic with frequent product introductions, delistings, and seasonal products as well as significantly varying total sales. Traditional time-series methods are, therefore, rather ill suited, presenting an opportunity for qualitative forecasting methods. In less dynamic assortments, the benefits of assortment forecasting in comparison to efficient, automated time-series methods are likely to be small or even non-existent.

Second, the confectionery company's assortment is very wide. This increases the stability of the assortment's sales distribution, as individual products or events usually do not significantly affect the distribution. In narrower assortments there is always the risk of a forceful campaign or an important new product introduction shifting the whole sales distribution, thus hindering the application of the assortment forecasting approach.

Third, as the confectionery company's Swedish business unit uses direct store deliveries, it has access to very high-quality demand information. There is no additional party, such as a wholesaler or customer warehouse in between introducing order batching in the demand information. This means that the sales data accurately reflects actual product ranks and that products' ranks do not move up and down without reason. When introducing the assortment

34.2

IIPDLM

forecasting method in new markets where the confectionery company's goods pass through wholesalers, the company has noticed that product ranks can behave irrationally due to order batching. Although there are means to filter out the distorting effect of order batching, access to high-quality demand information obviously supports implementation of the assortment forecasting.

Connection to previous findings

Obviously, the value of a new forecasting approach cannot be conclusively established based on a single case study. However, even though the case study presented in this paper is the first known implementation of assortment forecasting, analogous, although somewhat less sophisticated forecasting approaches have been implemented before.

McClelland *et al.* (2000) document how a Japanese apparel retailer's store managers and assistants produce forecasts by giving garments ranks from 1 to 7, sorting the products according to their mean rank and rank standard deviation, and associating a certain share of sales with the "A", "B", "C", and "D" products identified based on the ranking process. Two large US corporations also successfully use similar, slot-based forecasting approaches to forecast sales of shoes, music CDs, and computer software (Freeland, 2003). Their approaches are based on having merchandisers allocate products to a handful of different segments, or slots, based on the products' estimated sales success.

These previous implementations support the assumption that the use of ranks and scaling functions, rather than direct volume estimates, can be very useful in situations where:

- large assortments of products catering to a similar need and competing for the same customer attention are offered; and
- assortments are dynamic, having, for example, frequent product introductions.

Discussion and further research

As many studies demonstrate, judgmental methods play an important part in business forecasting (Dalrymple, 1988; Sanders and Manrodt, 1994). There is, thus, need for research on how the process of judgmental forecasting could be better supported and made more efficient.

Holmström's (1998) work – the assortment forecasting method – is a new and interesting approach to judgmental forecasting. Based on the results of the case study presented in this paper, the assortment forecasting method has the potential to reduce significantly time spent on judgmental forecasting. As increased efficiency is an important element in attaining sales force involvement in forecasting, this is an intriguing result. However, more testing and especially additional real-life implementations of the assortment Assortment forecasting method IJPDLM 34.2

156

forecasting approach or similar rank-based approaches are needed to understand fully the method's potential benefits and limitations.

In addition, since forecasting efficiency is an important prerequisite for forecasting collaboration, an interesting line of research would be to test the applicability of the assortment forecasting in inter-company collaboration.

Finally, there are several opportunities to develop further the assortment forecasting method. In its current form, the method makes only limited use of traditional forecasting models. The performance of the assortment forecasting approach could potentially be improved by using, for example, time-series forecasting to produce a first suggestion of product ranks and total assortment sales, and then let the forecaster make qualitative adjustments. As the combination of judgmental and statistical forecasting is supported by several researchers (Bunn and Wright, 1991; Lim and O'Connor, 1996), it can be considered likely that by seizing this opportunity, a very useful new forecasting approach could be developed.

References

- Armstrong, J.S. (2001), "Selecting forecasting methods", in Armstrong, J.S. (Ed.), *Principles of Forecasting*, Kluwer Academic Publishers, Norwell, MA.
- Basu, S. and Schroeder, R.G. (1977), "Incorporating judgments in sales forecasts: application of the Delphi method at American Hoist and Derrick", *Interfaces*, Vol. 7 No. 3, pp. 18-27.
- Bunn, D. and Wright, G. (1991), "Interaction of judgemental and statistical forecasting methods: issues & analysis", *Management Science*, Vol. 37 No. 5, pp. 501-18.
- Cadeaux, J.M. (1997), "A closer look at the interface between the product lines of manufacturers and the assortments of retailers", *International Journal of Retail & Distribution Management*, Vol. 25 No. 6, pp. 197-203.
- Dalrymple, D.J. (1988), "Sales forecasting practices", International Journal of Forecasting, Vol. 3 No. 3, pp. 379-91.
- Edmundson, R.H., Lawrence, M.J. and O'Connor, M.J. (1988), "The use of non-time series data in sales forecasting: a case study", *Journal of Forecasting*, Vol. 7 No. 3, pp. 201-11.
- Fildes, R. (1991), "Efficient use of information in the formation of subjective industry forecasts", Journal of Forecasting, Vol. 10 No. 5, pp. 597-617.
- Fosnaught, K. (1999), "The strategic power of consensus forecasting: setting your organization up to win", Journal of Business Forecasting Methods & Systems, Vol. 18 No. 3, pp. 3-7.
- Freeland, K. (2003), Personal communication, 14 August.
- Fulcher, J. (1998), "A common vision", Manufacturing Systems, Vol. 16 No. 2, pp. 88-94.
- Helms, M.M., Attain, L.P. and Chapman, S. (2000), "Supply chain forecasting collaborative forecasting supports supply chain management", *Business Process Management Journal*, Vol. 6 No. 5, pp. 392-407.
- Herbig, P., Milewicz, J. and Golden, J.E. (1993), "Forecasting: who, what, when and how", Journal of Business Forecasting Methods & Systems, Vol. 12 No. 2, pp. 16-21.
- Holmström, J. (1998), "Handling product range complexity: a case study on re-engineering demand forecasting", Business Process Management Journal, Vol. 4 No. 3, pp. 241-58.
- Jain, C.L. (2000), "Editorial: which forecasting model should we use?", Journal of Business Forecasting Methods & Systems, Vol. 19 No. 3, pp. 2-4.

Kahn, K.B. (1998), "Benchmarking sales forecasting performance measure", *Journal of Business* Forecasting Methods & Systems, Vol. 17 No. 4, pp. 19-23.

- Lapide, L. (1999), "New developments in business forecasting", Journal of Business Forecasting Methods & Systems, Vol. 18 No. 2, pp. 13-14.
- Lim, J.S. and O'Connor, M. (1996), "Judgmental forecasting with time series and causal information", *International Journal of Forecasting*, Vol. 12 No. 1, pp. 139-53.
- McClelland, A.S., Raman, A. and Fisher, M. (2000), "Supply chain management at World Co Ltd.", Harvard Business School Case N9-601-072.
- Makridakis, S. (1988), "Metaforecasting: ways of improving forecasting accuracy and usefulness", *International Journal of Forecasting*, Vol. 4 No. 3, pp. 467-91.
- Mentzer, J.T. and Bienstock, C.C. (1998), "The seven principles of sales-forecasting systems", Supply Chain Management Review, Fall, pp. 76-83.
- Mentzer, J.T. and Kahn, K.B. (1995), "A framework of logistics research", *Journal of Business Logistics*, Vol. 16 No. 1, pp. 231-50.
- Mentzer, J.T. and Schroeter, J. (1994), "Integrating logistics forecasting techniques, systems, and administration: the multiple forecasting system", *Journal of Business Logistics*, Vol. 15 No. 2, pp. 205-26.
- Moon, M.A. and Mentzer, J.T. (1999), "Improving salesforce forecasting", *Journal of Business Forecasting*, Vol. 18 No. 2, pp. 7-12.
- Muir, J.W. (1979), "The pyramid principle", Proceedings of 22nd Annual Conference, American Production and Inventory Control Society, pp. 105-7.
- Peterson, R.T. and Jun, M. (1999), "Forecasting sales in wholesale industry", Journal of Business Forecasting Methods & Systems, Vol. 18 No. 2, pp. 15-17.
- Plossl, G.W. (1973), "Getting the most from forecasts", *Production and Inventory Management*, Vol. 14 No. 1, pp. 1-16.
- Reese, S. (2000). "The human aspects of collaborative forecasting", Journal of Business Forecasting Methods & Systems, Vol. 19 No. 4, pp. 3-9.
- Safavi, A. (2000), "Choosing the right forecasting software and system", Journal of Business Forecasting Methods & Systems, Vol. 19 No. 3, pp. 6-10.
- Sanders, N. and Manrodt, K. (1994), "Forecasting practices in US corporations: survey results", *Interfaces*, Vol. 24 No. 2, pp. 92-100.
- Sparkes, J.R. and McHugh, A.K. (1984), "Awareness and use of forecasting techniques in British industry", *Journal of Forecasting*, Vol. 3 No. 2, pp. 37-42.
- Webby, R. and O'Connor, M. (1996), "Judgemental and statistical time series forecasting: a review of the literature", *International Journal of Forecasting*, Vol. 12 No. 1, pp. 91-118.

Assortment forecasting method

Efficient retailer assortment: a consumer choice evaluation perspective

Abdelmajid Amine and Sandrine Cadenat

The authors

Abdelmajid Amine is Associate Professor of Marketing and Sandrine Cadenat is Assistant Professor of Marketing, both at the University of Paris, IRG Research Center, Créteil Cedex, France

Keywords

Customer requirements, Retailers, Merchandising, Stores and supermarkets, France

Abstract

This research shows that to reach their prime goal of building an efficient assortment, retailers need, beside increasing the outlet's cost-efficiency, to evaluate shoppers' assortment perceptions so that what the store actually offers can be tailored to meet customers' needs and expectations. Our findings reveal that consumers' perceptions of the assortment range stems from the combination of few indicators, mainly the number of stock-keeping units proposed and the availability of the favorite brands. Also demonstrates that consumers evaluation of the overall store assortment draws on the perceived choice within the product categories where they are highly sensitive to the assortment range.

Electronic access

The Emerald Research Register for this journal is available at

http://www.emeraldinsight.com/researchregister

The current issue and full text archive of this journal is available at

http://www.emeraldinsight.com/0959-0552.htm



International Journal of Retail & Distribution Management Volume 31 · Number 10 · 2003 · pp. 486-497 © MCB UP Limited · ISSN 0959-0552 DOI 10.1108/09590550310497012

Introduction

The dense network of volume retail outlets throughout France provides consumers with a very wide choice of shopping opportunities. Shoppers can competitively evaluate trade names with the same sales format (intratype) against trade names offering different sales formats (intertype competition) (Hansen, 2003). This state of affairs makes it relevant to take a global approach to the competition, and is related to the acute contrast between retailer trade names (Lambrey and Filser, 1992).

If volume retailers are to appreciate fully the stores that shoppers compare them to, their outlook must be broader than a mere intratype-intertype approach. Mass merchandisers have to grasp how consumers perceive their retail outlets, based on the various constituent factors of positioning.

In their analysis of retail strategies, Benoun and Helies-Hassid (1995) break down the variables explaining retailers positioning into four headings: the store (set-up, location, architecture, flow system, lighting), the assortment (size, product range, style, brand policy, presentation), pricing policy (overall price levels, price range) and services (personnel, business hours, parking lot, after sales service). The French grocery superstores have always focused on their competitive advantage, resulting in practically the same prices at every superstore. As a result, volume retailers seek to gain their leading edge in the three other categories of variables. Considering the impact of the assortment variable on the likelihood of store choice, studies dedicated to this topic remain relatively few compared to those devoted to price or location attributes. However, variety of assortment is progressively admitted beside the latter factors as the main reason why consumers patronize their favorite stores (Arnold et al., 1983, 1996; Sécodip, 1997; Hoch et al., 1999).

It is widely recognized that traditional volume retailers have to control and limit the costs generated by the size of their assortment, namely by reducing low-selling

The authors gratefully acknowledge the IRG Research Center, the Département TC de Créteil and the FNEGE for their financial support to this research. They also thank the anonymous reviewers of the Journal for their helpful comments and suggestions. stock-keeping units (SKUs) that curb the cost-effectiveness of a product category or the entire retail outlet. However, mass merchandisers are obviously still reluctant to reduce their SKUs lest they lose a share of their customers (Broniarczyk *et al.*, 1998).

This observable fact clearly shows that it is relevant to address the link between actual assortment in a product category and the assortment perceived by the consumer. It also raises the issue of the likely existence of an "efficient assortment range" which can respectively satisfy the needs, goals and constraints of both consumers and retailers (Handelsman and Munson, 1985). This study focuses on how consumer assortment image is formed, and proposes to enhance our understanding of shoppers' assortment range perception of retail outlets and their store patronage.

Literature review and hypotheses

Assortment as a key variable of store image and store patronage

The image of a retail outlet is largely admitted to be shaped from the combination of cognitive and affective factors (Lindquist, 1974; Zimmer and Golden, 1988; Finn and Louviere, 1996). Assortment appears in a good place beside price level, quality, services and atmosphere.

Since the initial work of Martineau (1958) suggested that the store's image is the first factor that influences shopping behavior, considerable research had established a link between store image and store patronage. Monroe and Guiltinan (1975) and Hirschman (1981) showed the importance and impact of a store's image on some aspects of consumer behaviour such as selection or patronage of a retail outlet. Arnold et al. (1996, 1998) found that if a retailer succeed in being associated to the image of having a "strong community reputation" it may affect store choice and lower the impact of other store attributes like price. Finn and Louviere (1996) showed that among a list of nine store image attributes, wide assortment and low prices accounted for 86 percent of the variance in share of choice. Bell (1999) underlined significant relationships between quality and range of products and stores and consumers intent to patronize a retail center.

Besides the relationship between store image and store patronage, researches focused on identifying the most decisive factors for choosing a retail outlet (Mazursky and Jacoby, 1986). Their findings provided a reliable list of reasons why shoppers patronize a store. Price, assortment range, convenient location, perceived product quality, and customer service are the most commonly cited factors.

Nevertheless, the weighting of price, assortment and products quality as most important attributes in store choice, is not relevant uniformly across buying situations. Their weights can change radically. Van Kenhove *et al.* (1999) demonstrated that store attributes saliences varied significantly across task definitions. For instance, these authors showed that in case of an urgent purchase, consumers tend to value proximity of the store, quick service and product availability and to minor price, assortment range and even product quality.

In addition, the importance of store choice attributes seems to be store format dependent. Hansen (2003) found that while high product quality and freshness of products were ranked by specialty food stores' consumers at the first two places, assortment was number three, whereas low prices has been ranked 17 (among 29 factors).

However, if we focus our analysis on one-stop shopping, which represents for volume retailers the purchasing situation of reference, the prevalence of price, assortment, location and quality cannot be avoided when choosing a retail outlet.

Providing customers with choice is the same as altering the breadth or depth of the assortment. However, since assortment size strictly depends on the available surface area in the store, a volume retailer will partially or fully meet consumer expectations, depending on outlet area. As a result, the smaller the outlet area, the more the retailer will have to choose between either providing a broad offering, meeting different types of needs with few variety within each type or having a more limited assortment with many choices within each type of need. In these conditions, the assortment range becomes a decisive factor of perceived positioning and, as a result, of retail outlet patronage.

Since the mid-1990s, volume retailing has been trying to get a quart into a pint pot: consumers want more assortment; stores that do not meet this expectation for variety are poorly perceived. However, in the French retail marketplace for example, store area has not got much larger since the Raffarin law[1] restricted superstores location.

If we take a look at the restrictions stemming from the non-growth of shelf display area and from the cost-effectiveness goal, volume retailers will have to find a balance between "too many" and "not enough" SKUs on sale. This quandary is underscored by an empirical study (Chain, 1992) showing that, in some product categories, an increase in sales is associated with an increase in the number of SKUs (i.e. cereals, hair products). However, this study also found that, in other product categories, an increase in SKUs only confuses consumers and tends to detract from these products (i.e. scent water, best-sellers).

This study suggests that there are factors that prompt a volume retailer to offer a broader assortment to consumers as well as reasons that argue for a more limited assortment.

Factors in favor of increased assortment Several factors are likely to influence a volume retailer's choice of product variety (Lancaster, 1991). The first factor is a potential increase of demand following the offering of a broader variety. Tangible evidence of this is higher store patronage or an increase in the average shopping cart. McKenna (1989) stated that consumers are living in an era of diversity where they "demand more variety and assortment for all sorts of products, ranging from cars to clothes". Consequently consumer's need for variety affects the quantitative and qualitative make-up of the assortment. Koelemeijer and Oppewal (1999) showed that an increase in assortment size produces more additional purchases than changing/improving store ambience. In their analysis of retailers' performance drivers, Dhar et al. (2001) find out that the best performing retailers are also those who offer broader assortments.

The second factor affecting assortment growth involves the use of variety as a strategic dimension of retail store image. Wide assortment is viewed as an appealing store image attribute valued by consumers because they are more likely to find what they want when patronizing a store that offers more varied assortments (Hoch *et al.*, 1999). Krishnan *et al.* (2002) developed the notion of assortment consistency, which is a tacit commitment of a retailer to carry a given set of brands, sizes, colors and flavors from one period to another, so that a consumer who looks for his preferred brands will be able to find them for sure at that retail store.

The assortment range is then used as a major differentiating factor in the positioning strategies of retail outlets.

Factors promoting reduced assortment

The prime factor underlying the reluctance to broaden assortment stems from the limited space in stores. Shelf space is not limitless. It is one of the scarcest resources in a retail environment (Kahn, 1999). More SKUs on the shelf inevitably leads to poorer offering display readability. This increases the risk of shoppers confusion due to high variety (Huffman and Kahn, 1998), thus heightening the chances of negative consumer perception of the store (Nielsen, 1999).

Research on product merchandising has shown that optimum sales depend on a minimum shelf length for each item (Fady and Seret, 2000). This concern of a minimum occupancy argues for a repartition of the shelf space among a limited number of brands (with a sufficient number of SKUs each) rather than to an atomization of the offering.

Moreover, there is an economic rationale to limited assortment, e.g. scale economies and product cost-sharing (Lancaster, 1991). Volume retail strategy (low profit margins, high turnover) peculiar to mass merchandising requires high sale potential for each SKU and follows a rationale of limiting their number.

We can deduce from the analysis above that market constraints (consumers and competitors) are factors that prompt decisions to broaden assortment whereas available shelf space and the need for enough shelf facings per brand lead to the opposite trend.

Deeper insight into the concept of consumers' perceived assortment is key to helping mass merchandisers build their assortment, and deal with the abovementioned contradictions. However, in the literature few attempts have been made to combine the consumers' and retailers' assortment perspectives, whereas researchers and marketers are increasingly aware of the necessity to match consumer variety needs with retailer assortment strategy (Handelsman and Muson, 1985).

Research purposes and hypotheses

Even if it is admitted that when consumers shop, they are exposed to a reality partially controlled by the retailer (selection range, personnel, prices, colours, flavors, and so on), shoppers do not always evaluate variety rationally (Williard Bishop Consulting, 1993). This result is consistent with the deformant property of the perception process highlighted in consumer behavior literature (Amine, 1999). In the perspective of testing the fit between consumers' and retailers' assortment views, we hypothesize that shoppers may perceive assortment range differently from the effective assortment size. We formulate then the following hypothesis:

H1. The perceived assortment range "do not" truly mirrored the actual offering provided by the volume retailer.

Some research suggest that consumers' perceptions of the assortment range can potentially be deduced from the presence of a set of indicators. For instance, a shopper, who is attached to a preferred brand shapes his/her assortment range perception upon the availability of these brands at the retail outlet (Broniarczyck et al., 1998). Moreover, one can expect that for a shopper who is sensitive to the price variable, the perceived assortment range in the store may depend on the availability of entry-level priced items. Nevertheless, although there are several cues that can be potentially used by consumers to form their assortment image, they are likely using simplifying heuristics to make certain choices easier (Simonson, 1999). Hence, we suggest that, when forming their assortment perception, shoppers may use one or few relevant indicators for evaluating choice variety, whatever the product category. Our second hypothesis can be formulated as the following:

H2. Consumers may use one or very few criteria to evaluate the assortment range at the product category level.

Studies on shoppers variety seeking behaviors (McAlister and Pessemier, 1982; Aurier, 1991; Simonson and Winer, 1992) and on the nature of product classes provide material for theoretical research on the notion of the variety available to consumers. In a large study covering 20 product categories, Kapferer and Laurent (1992) showed that "delight products" such as yogurt or jam tend to spur variety-seeking behavior. "Loyalty goods" like coffee, foster moderate or lukewarm need for variety. However "utilitarian goods" like batteries or dish detergent do generate a low tendency to change behavior.

Therefore, a link can be made between consumers' level of need for variety and their assortment size expectations within the categories. Consequently, we can assume that the assortment image of the entire store draws on the consumer's perception of the assortment range on the shelves where the need for variety is higher. We can then express our third hypothesis:

H3. Consumers draw on their perception of the available choice range in categories where they are sensitive to variety to form a global assortment image of the store.

Research method

In this research, we intend to explore first what shoppers use to evaluate the variety on sale at the product category level and throughout the store. Then we will engage in an evaluative approach of perceived assortment and how they shape choice range perceptions of retail stores. Hence, our data collection procedure covers both a qualitative and a quantitative phases.

Qualitative pilot study

An exploratory qualitative study was conducted to clarify what a wide assortment means for consumers, and what cues they use to assess choice range. This study serves also to know whether consumers' need for variety vary among product categories. A series of 14 semi-structured interviews were performed involving consumers who do their own shopping or at least are actively committed to this chore (including ten female and four male with different ages, marital status and occupations).

Even if the sample size seems a priori limited, both of the exploratory nature of this research step and the principle of saturation (Glaser and Strauss, 1967) allow us to consider it as quite sufficient. According to this rule, the appropriate size for a sample in a qualitative study, is the one that permits to reach the theoretical saturation where any additional observation do not more enrich or improve significantly the already collected information.

The content analysis revealed that respondents link the wide assortment in the product categories and throughout the store with an array of different indicators such as no (visible) stockoutage, number of product units (SKUs), availability of the favorite brands, many brands, diverse products, products seen on TV, new products, atypical products for limited targets, upmarket products, different quality levels, different color packagings, different price levels and national brands. Hence, consumer assortment perception initially seems fairly jumbled, since it is potentially linked to a set of indicators that can be used singly or together, depending on the individual, and the shopping or usage circumstances.

While certain cues have been mentioned especially for a particular category (an example of atypical product for limited target would be "light biscuits"), other indicators have been cited for many product classes. The latter cues are those that have been retained further for our quantitative investigation.

Interviews analysis also showed that consumers' assortment size needs vary depending on the product category. They gave us a firmer grasp on the product classes where they have high, average and low needs for assortment variety. For instance, respondents unanimously demand a large assortment range at the yogurt counter, an average assortment at the shampoo, coffee, and cookie counters, and express clearly less need for variety at the dish detergent or battery counters.

This apparent link between the need for variety and the assortment size expectations will be tested in the quantitative phase of the research.

Quantitative research study

This quantitative phase aims first to compare the perceived assortment range based on the cues that emerge from the pilot study with actual offering at two French volume retailers. It looks also to assess in what extent these cues contribute to shape the perceived assortment at the product category level and how the overall store assortment image is built by consumers. One type of large format retailers was selected: hypermarkets because of the role of broad assortments in the prevalence of one-stop shopping (Messinger and Narsimhan, 1997). Consumers are supposed to make a choice (of a hypermarket for instance) on the basis of cost minimization over transportation, evaluation and price efforts (Krider and Weinberg, 2000).

Hypermarkets are big sized stores selling food and non-food merchandises, characterised by wide product assortments, low prices and high volume business (Arnold, 2000). This kind of large format retailer has a big economic weight in the French retail system since at the date of 1998, among more than 1,100 hypermarkets counted in France, over 100 of them realize about €153.5 millions in sales turnover each per year (Cliquet, 2000). French hypermarkets sizes ranged from 2,500m² to 25,000m² with an average surface of about 8,000m² per store. Owing to their large surface, hypermarkets are (most likely to be) located in a suburban area of towns, within large shopping centers that improve multi-purpose purchases.

We chose two average sized hypermarkets belonging to two leading volume retailers chains in France: Carrefour and Auchan. These stores, located in the closed suburbs of Paris at Porte Montreuil and Porte Bagnolet, respectively, are 3km apart and their sizes are respectively about 8,500m² and 10,000m².

Based on the results of our qualitative research, we decided to include in our investigation three product categories while dealing with high, moderate and low levels of need for variety. Yogurt, coffee and dish detergent categories were selected.

The questionnaire helped determine the aspects related to the evaluation of global store assortment, and assess the assortment range at the counters level. This was done by using either a single-item measurement or invariant indicators of assortment range identified during the previous qualitative phase. These cues cited commonly for various product classes are:

- availability of national brands;
- tavorite brands;
- new products;
- different price levels;
- multiple quality levels; and
- number of SKUs.

Thanks to a pretest with 60 shoppers, we ratified the questionnaire's items formulation and controlled the variance in assortment size expectations and need for variety at the three counters. Final data collection was carried out during the first term of 1999. A hybrid sampling procedure was used to select the respondents. We first asked each third visitor leaving the checkout counter of the two hypermarkets to co-operate to the research. We checked as we went along that we were close to French hypermarket customers distribution in terms of age and gender[2]. The questionnaires were also spread across the weekdays in order to cover the diversity of shoppers' profiles.

A total of 284 workable questionnaires was completed and processed. For methodological as well as managerial reasons, we found it relevant to break down shopper groups according to the number of shopping trips to Carrefour or Auchan during the last two months. This criterion was used as a proxy for the respondent's familiarity with the assortment range and composition within each hypermarket. Three shopper groups were identified: a first consumer sub-sample made nearly the same number of shopping trips to both stores (n1 = 90), a second group shopped mostly (more than 50 percent of their purchases during the period) at Auchan hypermarket (n2 = 96) and a third subsample realized mainly their purchases at Carrefour $(n3_2 = 98).$

Each respondent was questioned on his/her perception and evaluation of the assortment range in the three product categories in the store that he or she regularly shopped (in Auchan or Carrefour for single shoppers groups and in both stores for the two-store shoppers group).

Results discussion

The in-store observation of the number of SKUs in each product category gives the Auchan store a clear advantage over the competing Carrefour, at the three counters. This can be seen in Table I.

The aim of this first statistical analysis was to check whether the perceived differences between the two stores, at the counters and throughout the store (single item measurements) do or do not correspond with actual offering in these stores. Broniarczyk Volume 31 · Number 10 · 2003 · 486-497

Table 1	Number (of SKUs per	product (category	(in-store observations)
---------	----------	-------------	-----------	----------	-------------------------

	Dish detergent	Coffee	Yogurt
Auchan Superstore (A)	18	73	289
Carrefour Superstore (C)	13	62	267
Relative percentage			
differences (A-C)/A	27,8	15.1	7,6

et al. (1998) found that consumers did not perceive SKUs changes below 25 percent threshold. According to this result and with respect to the values contained in Table I we can expect a significant difference of choice perception between the two stores for the dish detergent category.

Actual and perceived assortment range comparison

For the comparison purpose, the subsample of two-store shoppers was used as a benchmark to position the results in each of the single-store shopper groups (Carrefour or Auchan). The former group provides an invariable assessment system of the two stores since it is the same respondents who grade the two outlets in which they regularly make their purchases.

Findings on Table II show that shoppers do not perceive any difference in assortment range between the two stores, at the dish detergent counter whereas more SKUs are actually sold and the devoted shelf space is 50 percent bigger at Auchan. On the other hand, they feel that Auchan, compared to Carrefour, offers a wider variety at the coffee and yogurt counters, an observation corroborated by actual offering (shelf space differences are respectively 22 percent and 10 percent higher at Auchan). At this step of the analysis, our results do not support the variation's magnitude threshold of 25 percent suggested by Broniarczyk *et al.* (1998).

Two lessons should be drawn from these first findings:

- Actual offering and perceived assortment within the two stores are tightly coherent at yogurt and coffee counters where consumers' needs for variety are high. Respondents were able to notice the fair differences in assortment range at these categories between the two stores.
- (2) There is an assimilation effect of the gap between actual and perceived assortment in the dish detergent category where choice sensitivity is low[3] whereas the

Efficient retailer assortment: a consumer choice evaluation perspective Abdelmajid Amine and Sandrine Cadenat

International Journal of Retail & Distribution Management Volume 31 • Number 10 • 2003 • 486-497

Table II Assortment range perceptions scores (two-store shoppers group)*

<u></u>	Dish detergent	Coffee	Yogurt	Overall store
Auchan Superstore (A)	3,64	4.05	4,18	4,37
Carrefour Superstore (C)	3.59	3.73	4.01	4.1
Paired z-test value (A-C)	n,s,	7.05***	2.58**	2.13*

Notes: $n_1 = 90$; "Average scores calculated on five-point Likert scales, ranging from 1 (totally disagree) to 5 (completely agree) with assertions on the "assortment proposed"; "scores difference significant at p < 0.05; "scores difference significant at p < 0.01; "scores difference significant at p < 0.001

effective offering in Auchan was much larger than in Carrefour.

As a result, assortment management at product categories entails more than the standard financial indicators of cost-effectiveness (i.e. items turnover). It gains to also involve controlling a key variable – choice sensitivity – that is instrumental in deciding how much shelf space should be devoted to product families or subfamilies. These conclusions suggest that the threshold below which consumers do not perceive assortment range variations should be moderated by the choice sensitivity strength which is category specific.

Moreover, data in Table II reveal that, for the two-store shoppers, Auchan offers broader overall assortment than Carrefour (significant perceived difference at p < 0.05). Their observation is substantiated by the real offering at the two stores either with the number of SKU's proposed or the store size. Consumers seem to have an overall representation of store space and product offering that does mirror reality whereas, at the fragmented product class level, their sensitivity to choice range seems to shape the perception they have of the assortment for sale. Our first hypothesis seems to be rejected at the store level and partially supported at the category level.

Assortment range assessment at the product category level

We aimed here to assess to what extent variety indicators shape the assortment perception for the three shopper groups. Multiple regression analyses were performed using the collected data about the six choice variety indicators (predictor variables) and the overall single item measurement of the assortment range per product class (the criterion variable).

Our statistical results (see Tables III and IV show that for the three samples, assortment range perception at the dish detergent, coffee and yogurt categories can be almost solely explained by the cue of the perceived number of SKUs available (r-values ranging from 3.4 to 9.23 all significant at p < 0.001). The regression models with essentially this single variable explain mainly 50 to 75 percent of the perceived assortment range variance according to the store and shopper group. Two other indicators, the availability of leading national brands and the presence of favorite brands, play an occasional but significant role in explaining perceived assortment evaluations in the categories under study. The three remaining items that were part of the multi-items measurement (for instance; new products availability, different price levels and multiple quality levels) were removed for parcimony and collinearity reasons[4]. On the one hand, the contributions of these variables were not strong enough to be maintained within the regression models. On the other hand, the latter two variables (price and quality levels) were significantly correlated among themselves and with the number of SKUs and weakly related to the criterion variable.

In spite of the various assortment indicators identified during the qualitative phase, apparently consumers primarily use the number of products proposed in the category and secondarily national brands and preferred brands availability when shaping their assortment perception. This result supports our second hypothesis.

The analysis of the results at the three counters show that the overall quality of fit in the regression models is clearly better for the yogurt (F statistics varying from 48 to 91.7) and coffee (F statistics ranging from 33 to 57.5) categories. This can be explained by the fact that these product classes foster quite high variety seeking behaviors, thus spurring consumers to pay more attention to the wide range of available products.

Efficient retailer assortment: a consumer choice	evaluation	perspective
Abdelmajid Amine and Sandrine	Cadenat	

International Journal of Retail & Distribution Management Volume 31 · Number 10 · 2003 · 486-497

Table in non-choice rande molectors containance to associate reading and product category rever fitto store should be group

Product category	Assortment range indicators	β	t-value	Significance	F-statistic	R ²
Auchan hypermarket ($n_1 = 90$)						
Dish detergent	National brands availability	0,30	4,1	0,0001		
	Favorite brand availability	~	-	-	42.13	0.60
	Number of SKUs proposed	0.64	8.61	0.0001		
Coffee	National brands availability	0.21	2.75	0.01		
	Favorite brand availability	0.20	2.65	0.01	57.5	0.67
	Number of SKUs proposed	0.59	8.40	0.0001		
Yogurt	National brands availability	-	-	-		
	Favorite brands availability	0.30	3.29	0.001	18.88	0.40
	Number of SKUs proposed	0.46	5.11	0.0001		
Carrefour hypermarket $(n_1 = 90)$						
Dish detergent	National brands availability	0.22	2.56	0.01		
	Favorite brand availability	-	-	_	35.2	0,55
	Number of SKUs proposed	0.57	6.54	0.0001		
Coffee	National brands availability	0.20	2.46	0.01		
	Favorite brand availability	-	-	-	48.15	0.63
	Number of SKUs proposed	0.62	7.96	0.0001		
Yogurt	National brands availability	0.20	2.26	0.05		
	Favorite brand availability	0.20	2,37	0.05	48.13	0,63
	Number of SKUs proposed	0.51	5.91	0.0001		
Notes: All F-tests are significant a	t p < 0.0001					

Table IV How choice range indicators contribute to assortment assessment at counters level (single-store shoppers group)

Product category	Assortment range indicators	ß	t-value	Significance	F-statistic	R ²
Auchan hypermarket (n _z = 96)			3)	150		
Dish detergent	National brands availability	0.23	3.08	0.005		
	Favorite brand availability	-	-	_	40.1	0.57
	Number of SKUs proposed	0.67	9.23	0.0001		
Coffee	National brands availability	0.36	4.75	0.0001		
	Favorite brand availability	SURA	BAYA _	-	54.15	0.64
	Number of SKUs proposed	0.51	6.85	0.0001		
Yogurt	National brands availability	0,26	2.9	0.005		
-	Favorite brand availability	0.14	2,27	0.05	91.7	0.75
	Number of SKUs proposed	0.59	7.49	0.0001		
Carrefour hypermarket ($n_3 = 98$)						
Dish detergent	National brands availability	0,44	4,16	0,0001		
	Favorite brand availability	-	-	-	24.56	0.44
	Number of SKUs proposed	0.32	3,40	0.001		
Coffee	National brands availability	0.39	4.43	0.0001		
	Favorite brand availability	-	~	-	32.93	0.51
	Number of SKUs proposed	0.35	4.2	0.0001		
Yogurt	National brands availability	-		_		
	Favorite brand availability	0.24	2.77	0.01	51.79	0.62
	Number of SKUs proposed	0.55	6.49	0.0001		
Notes: All F-tests are significant a	at p < 0.0001					

493

Volume 31 · Number 10 · 2003 · 486-497

The "number of SKUs" variable weighted strongly in the three product categories, and for the three shopper groups. Two other cues, presence of national brands and favorite brand, are usually used to assess assortment variety, especially for the two-store shoppers and Carrefour shoppers. It even means that the presence or absence of the preferred brand and/or of national brands tends to distort shoppers assortment range perceptions. Broniarczyk *et al.* (1998) underlined the same role of the "availability of the favorite brand" as an important cue in the shaping of assortment perceptions.

Our results above, obtained at shopper groups level and for each hypermarket, are substantiated and stressed at the aggregate level when the data were pooled. Table V confirms the prevailing weight of the number of SKU's and the significant role of the preferred brand availability in shaping consumers' assortment in the categories where they are more choice sensitive (yogurt and coffee.).

How do shoppers build the overall store assortment image?

Our third research goal addressed how the overall image of store assortment was shaped, drawing on the perceived assortment at the product classes generating high variety expectations. According to H3, we expected that assortment perception at the yogurt counter, and secondarily at the coffee product category, had the most decisive impact on the global perceived image of assortment at the Auchan and Carrefour stores. So, we carried out regression analyses of assortment indicators at each of the three categories (predictor variables) on the overall assortment measurement at the outlet (the dependent variable). In spite of significant results obtained at both stores, regression models fit better in the case of Carrefour superstore (R^2 ranging from 30 to 50 percent and F statistics varying from 13 to 28). Moreover, it appears that the assortment perception of the two stores is mainly explained by the perceived choice range at the product categories where consumers are more variety sensitive (yogurt followed by coffee) supporting so our third hypothesis. It should also be pointed out that, for the two-store shoppers, the three counters contribute significantly to the shaping of the store's assortment image.

This finding should be qualified since, for the two-store shoppers group, the yogurt counter in Auchan hypermarket does not weigh significantly in assortment perception at the corporate level. The explanation can be found in the low variation in the assortment evaluation of this counter, that is unanimously perceived as providing a wide range of variety[5].

Our findings provide a deeper insight into how the assortment image and the choice of an outlet are shaped. They highlight the impact of few choice range indicators (namely number of SKUs, national brands availability and presence of the favorite brand) in shaping the assortment range perceptions either at the category or the store levels.

We also demonstrate the relevance of consumers choice range sensitivity as a significant variable in the assortment evaluation either at the product category or the entire store levels. Shoppers do notice and react differently to the changes that occur in the assortment size according to their choice sensitivity at the product categories under study. While small differences in highly choice sensitive product classes would be easily perceived (see yogurt and coffee examples), larger differences in the

Table V How choice range indicators contribute to assortment range assessment (pooled data for the two hypermarkets and all three groups)

Product category	Assortment range indicators	β	t-value	Significance	F-statistic	R ²
Dish detergent	National brands availability	0.28	6,68	0.0001		
	Favorite brand availability	-	-	-	132.34	0.52
	Number of SKUs proposed	0.54	13,31	0.0001		
Coffee	National brands availability	0.29	7,17	0.0001		
	Favorite brand availability	0.12	3.12	0.005	181.77	0.60
	Number of SKUs proposed	0,51	13.2	0.0001		
Yogurt	National brands availability	0.16	3.91	0.0001		
	Favorite brand availability	0.22	5.74	0.0001	219.3	0.64
	Number of SKUs proposed	0.54	13.26	0.0001		

assortment size in less choice sensitive categories would not be noticeable by consumers (dish detergent).

Implications of these results for retailers' assortment policy are discussed below.

Conclusions and implications for assortment management

This research shows, in the specific case of two French leading hypermarkets, the relevance of matching consumers' variety needs with retailers' assortment strategy. It establishes that the product classes proposed in a retail outlet do not contribute equally to the store's variety image and attractiveness from the customers point of view. It also demonstrates that consumers' perceptions of the overall store assortment draws on the assortment range perceived at those categories where consumers are highly sensitive to choice range variety. These first findings are very interesting because they show that a retailer's assortment policy does not always pay off when the effort is focused on product classes where consumers do not expect to find a wide variety.

From a theoretical standpoint, this research can deepen our insight into consumers' assortment evaluation process. It shows that the assortment evaluation at the category level stems from the combination of few indicators, such as the number of available products (SKUs) or the presence of major brands. This result is in accordance with Koelmeijer and Oppewal (1999) experimental study on customers' assortment perceptions at a flowers retail outlet. These authors find out that shoppers shape their assortment size perception by drawing on very few indicators, mainly the perceived number of available SKUs. We also demonstrate that the presence of the favorite brand plays a significant role in shaping the assortment perceptions especially when dealing with products where the consumer is much more committed to a particular brand. This finding supports Broniarczyck et al.'s (1998) conclusion on the positive impact of the preferred brand availability in forming consumers' perceptions of choice range variety.

Our work also identifies an explanatory variable – choice sensitivity – of the possible distortions between real and perceived assortment (in the sense of under- or over-evaluating the actual assortment range proposed). Hence an assimilation effect occurs between perceived and actual assortment range when consumers are not highly choice sensitive at the product category even if there are significant effective differences (dish detergent). On the other hand high choice sensitivity can incur a contrast effect even though the real differences or changes are weak (coffee and yogurt).

This choice sensitivity key variable allows finally to sharpen Broniarczyk *et al.*'s (1998) findings in the sense that the threshold's magnitude under which the assortment variations are noticed by customers are category specific.

Since our outlook is to further the guidelines for an efficient assortment policy, we can suggest some action levers for retail management. Our research shows that a store's assortment image is shaped from the perceived assortment at the categories where variety expectations are the strongest. To help mass merchandisers allocate shelf space, the choice sensitivity variable can serve to assess consumer expectations and can supplement the financial and economic ratios. It allows volume retailers adjust the number of SKUs on sale without reducing customers' assortment image or store patronage. Thus the product classes where shoppers are highly choice sensitive can be used as a lever to improve the patronage by offering a wide variety including the favorite brands. Inversely, retailers can reduce items number in the categories where consumers are less sensitive or have less assortment range expectations without altering neither the category nor the store attendance and sales.

So, evaluating shopper choice sensitivity contributes to streamlining retailers assortment range. How much assortment can be pared down by removing the lowest selling items without displeasing or losing a part of the store customers is to be determined per product category. We believe that experiments controlling assortment size and make-up to evaluate the impact on assortment evaluation and outlet patronage could be productive.

Research limitations

Some limitations to our investigation have to be pointed out. Our data collection procedure was not purely a probabilistic sampling and this might have influenced our data processing results. This must be solved by involving retailers more tightly to the research to access to customers databases and select randomly the subjects for the study. Another potential limitation stems in the number of product categories and stores selected for this research that are limitative in number and nature. Thus further research could benefit from diverse and large number of products, more retail stores and perhaps help to establish boundary conditions for our results.

Our contribution clears the way for additional research to extend our knowledge and understanding of consumer reactions to the available products at a store. We feel that incorporating situational factors into the analysis of assortment perception is a productive avenue of research. A study with this outlook (Simonson and Winer, 1992) has already shown that the number of purchases in one product category, during the same shopping trip, has an impact on perceived assortment. The more purchases there are, the more consumers are prompted to buy different variants of the product, and as a result, to look differently at the assortment available at the counter. Other situational factors, such as time pressure or purchase urgency, are potentially interesting to include in further research since they seem to have an impact on the perceived assortment range and on the indicators marshaled by consumers for this purpose.

Notes

- 1 The Raffarin law on stores location (1996) requires from retailers who intend to open new stores of more than 300m² to ask for a special authorization. This French law has considerably reduced the number of new retail outlets creations.
- 2 Our sample presents the following distribution on the criteria of gender (30 percent of males vs 70 percent of females) and age (25 percent of the subjects were contained between (20-30 years), 27 percent included in (31-40), 25 percent contained between (41-50) and 23 percent included in (51-70)).
- 3 This concept of choice sensitivity can be defined as the importance given by the consumer to the choice range variety in his evaluation process.
- 4 The problem of multi-collinearity is said to be present in a multiple regression analysis where predictor variables are highly correlated among themselves. When it occurs, the multi-collinearity phenomenon alterates the efficiency and the meaning of the estimates for the regression

parameters. However, "The assumption of multi-collinearity is often violated because many variables of interest in marketing vary together" (Churchill, 1991 p. 843).

5 Mean score (M) = 4.18 (on a five-point Likert scale ranging from 1 (totally disagree) to 5 (completely agree) with assertions on the "assortment proposed"); standard deviation (SD) = 0.48; coefficient of variation ((SD/M)) × 100) = 11.5 percent. This weak coefficient of variation (below 25 percent) indicates a low dispersion of the observed values' distribution.

References

- Amine, A. (1999), Le comportement du consommateur face aux variables d'action marketing, Editions Management et Société, Caen.
- Arnold, S.J. (2000), "Market impacts of large format retailers", Journal of Retailing and Consumer Services, Vol. 7 No 4, pp. iii-v.
- Amold, S.J., Oum, T.H. and Tigert, D.J. (1983), "Determining attributes in retail patronage: seasonal, temporal, regional, and international comparisons", Journal of Marketing Research, Vol. 20, May, pp. 149-57.
- Arnold, S.J., Handelman, J. and Tigert, D.J. (1996), "Organizational legitimacy and retail store patronage", Journal of Business Research, Vol. 35 No 3, pp. 229-39.
- Arnold, S.J., Handelman, J. and Tigert, D.J. (1998). "The impact of market spoiler on consumer preference structures (or What happens when Wal-Mart comes to town)", Journal of Retailing and Consumer Services, Vol. 5 No 1, pp. 1-13.
- Aurier, P. (1991), "Recherche de variété: un concept majeur de la théorie en marketing", Recherche et Applications en Marketing, Vol. 6 No 2, pp. 85-106.
- Bell, S.J. (1999), "Image and consumer attraction to interurban retail areas: an environmental psychology approach", *Journal of Retailing and Consumer Services*, Vol. 6 No 2, pp. 67-78.
- Benoun, M. and Héliès-Hassid, M.-L. (1995), Distribution: Acteurs et Stratégies, Economica, Paris.
- Broniarczyk, S.M., Hoyer, W.D. and McAlister, L. (1998), "Consumers' perceptions of the assortment offered in a grocery category: the impact of item reduction", Journal of Marketing Research, Vol. 35, May, pp. 166-76.
- Chain, C. (1992), Distribution. La révolution Marketing ou l'odyssée de l'enseigne, Éditions Liaisons, Paris.
- Churchill, G.A. (1991), Marketing Research. Methodological Foundations, The Dryden Press, Orlando, FL
- Cliquet, G. (2000), "Large format retailers: a French tradition despite reactions", *Journal of Retailing and Consumer Services*, Vol. 7 No 4, pp. 183-95.
- Dhar, S.K., Hoch, S.J. and Kumar, N. (2001), "Effective category management depends on the role of the category", *Journal of Retailing*, Vol. 77 No. 2, pp. 165-84.
- Fady, A. and Seret, M. (2000), Le Merchandising: Techniques modernes du commerce de détail, Vuibert, Paris.

Finn, A. and Louviere, J.J. (1996). "Shopping center image, consideration and choice: anchor store contribution", *Journal of Business Research*, Vol. 35 No. 3, pp. 241-51.

Glaser, B.G. and Strauss, A.L. (1967), The Discovery of Grounded Theory: Strategies for Qualitative Research, Aldine de Gruyter, New York, NY.

Handelsman, M. and Munson, J.M. (1985), "On integrating consumer needs for variety with retailer assortment decisions", Proceedings of the Association for Consumer Research, ACR, pp. 108-12.

Hansen, T. (2003), "Intertype competition: specialty food stores competing with supermarkets", *Journal of Retailing and Consumer Services*, Vol. 10 No. 1, pp. 35-49.

Hirschman, E.C. (1981), "Retail research and theory", in Enis, B.M. and Roering, K.J. (Eds), Review of Marketing, American Marketing Association, Chicago, IL, pp. 120-33.

Huffman, C. and Kahn, B.E. (1998), "Variety for sale: mass customization or mass confusion?", *Journal of Retailing*, Vol. 74 No. 4, pp. 491-514.

Hoch, S.J., Bradlow, E.T. and Wansink, B. (1999), "The variety of an assortment", Marketing Science, Vol. 18 No. 4, pp. 527-46.

Kahn, B.E. (1999), "Introduction to the special issue: assortment planning", *Journal of Retailing*, Vol. 75 No. 3, pp. 289-93.

Kapferer, J.-N. and Laurent, G. (1992), La sensibilité aux marques, Editions d'Organisation, Paris.

Koelmeijer, K. and Oppewal, H. (1999), "Assessing the effects of assortment and ambience: a choice experimental approach", *Journal of Retailing*, Vol. 75 No 3, pp. 319-45.

Krider, R.E. and Weinberg, C.B. (2000), "Product perishability and multistore grocery shopping", *Journal of Retailing and Consumer Services*, Vol. 7 No. 1, pp. 1-18.

Krishnan, T., Koelemeijer, K. and Rao, R. (2002), "Consistent assortment provision and service provision in a retail environment", Marketing Science, Vol. 21, No 1, pp. 54-73.

Lambrey, B. and Filser, M. (1992), "La polarité perçue des enseignes en distribution: une analyse dynamique", Actes du 8ème Congrès de l'AFM, Lyon, pp. 367-79.

Lancaster, K. (1991), "L'analyse économique de la variété de produits: une revue de la littérature", Recherche et Applications en Marketing, Vol. 6 No. 1, pp. 53-84.

- Lindquist, J.D. (1974), "Meaning of image", Journal of Retailing, Vol. 50 No. 4, pp. 29-38.
- McAlister, L. and Pessemier, E. (1982), "Variety seeking behavior: an interdisciplinary review", Journal of Consumer Research, Vol. 9 No 3, pp. 311-22.
- Martineau, P. (1958), "The personality of the retail store", Harvard Business Review, Vol. 36, January/February, pp. 47-55.
- Mazursky, D. and Jacoby, J. (1986), "Exploring the development of store images", *Journal of Retailing*, Vol. 62 No. 2, pp. 145–65.
- McKenna, R. (1989), "Marketing in age of diversity", Harvard Business Review, September-October, pp. 25–6.
- Messinger, P.R. and Narsimhan, C. (1997), "A model of retail formats based on consumers' economising time", *Marketing Science*, Vol. 16 No. 1, pp. 1-23.
- Monroe, K.B. and Guiltinan, J.P. (1975), "A path analytic exploration of retail patronage influences", *Journal* of Marketing Research, Vol. 2, June, pp. 19-28.

Nielsen (1999), "Evolution de l'offre marchande en GMS de 1994 à 1999", 27 èmes Journées Annuelles de l'IFM (Institute Français du Merchandising), December, Paris,

Sécodip (1997), Marketing Handbook, Paris.

Simonson, I. (1999), "The effects of product assortment on buying preferences", *Journal of Retailing*, Vol. 75 No. 3, pp. 347-70.

Simonson, I. and Winer, R.S. (1992), "The influence of purchase quantity and display format on consumer preference for variety", *Journal of Consumer Research*, Vol. 19 No. 1, pp. 133-8.

- Van Kenhove, P., De Wulf, K. and Van Waterschoot, W. (1999), "The impact of task definition on store-attribute saliences and store choice", Journal of Retailing, Vol. 75 No. 1, pp. 125-48.
- Williard Bishop Consulting Ltd and Informaton Resources Inc. (1993), "Variety or duplication: a process to know where you stand", report prepared for the Food Marketing Institute.
- Zimmer, M.R. and Golden, L.L. (1988), "Impressions of retail stores: a content analysis of consumer images", *Journal of Retailing*, Vol. 64 No. 3, pp. 265-93.

