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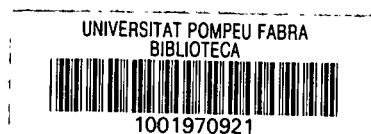
How Products' Case Volumes Influence Supermarket Shelf Space Allocations and Profits.

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Abstract

An empirical investigation finds that, under certain common conditions, consumer packaged goods are allocated supermarket shelf space in proportion to the volumes of their outer cases ($R^2 = .81$). This relationship indicates that manufacturers can increase their products' shelf allocations, and hence their profits, at competitors' expenses by producing oversized cases.

How Products' Case Volumes Influence Supermarket Shelf Space Allocations and Profits

Introduction

As a key merchandising decision, the allocation of shelf space to products has rightly been treated often in the scientific marketing journals (Andersen 1979, Preston and Mercer 1990, Zufryden 1987). The literature, however, has been more concerned with optimizing space allocations, generally using advanced mathematical programming techniques, than with implementing the calculated optima. For example, Bultez and Naert (1988) carefully optimized products' space allocations in relation to the elasticity of sales to shelf space but were unable to implement their solution due to unnamed "practical considerations".

In practice, throughout Europe [1], products' shelf space allocations are often dictated by a "practical consideration": the physical volumes of products' cases. The physical volume of a product's case - the casevolume - can determine the shelf space which products receive because grocers generally deliver to their stores from central warehouses in caselots and, as stores haven't backrooms, grocers must place the entire case on the shelf. Casevolumes even influence space allocations in chains with backrooms; such as Spain's Dia or Germany's Aldi, because these chains follow a "one case plus" stocking rule: a procedure which requires that every product be allocated at least one casevolume of shelf space.

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[1] The terms "European" and "American" are used to refer to *prevailing* practices throughout the EU, and the United States respectively. It is recognised, however, that both entities display enormous variety.

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If casecounts and casevolumes are optimal from the stand point of grocers' costs then a relation between casevolumes and shelf space allocations would only be a curiosity. However, there is evidence supporting the contention that over-high casecounts are increasing grocers' in-store inventory. For example, Ireland and Farrán (1990) found that five Spanish supermarket chains carried an average of 22 days of on-shelf inventory despite the prevalence of *daily* delivery. Some products had up to *two years* of on-shelf inventory.

More compelling evidence of casecounts' sub-optimality throughout Europe is that such multinationals as Procter and Gamble and Unilever offer only one casecount per SKU[2] . Thus, a traditional "Mom and Pop" store has to order the same case quantity as a giant hypermarket! Moreover, both slow selling expensive Scotch whisky and fast selling cheap wine both come 12 bottles to the case. It seems fair to state that if casecounts are neither modified by channel nor by product characteristics then actual casecounts are suboptimal for some products and some grocers. One may well ask, if "one size fits all", then why do these giants customize casecounts for important clients in the United States?

The objectives of this research are twofold. First, to model the relationship between casevolumes and shelf space allocations and to empirically test the model's predictive validity. Second, an empirical test will try to determine whether or not manufacturers consider grocers' costs when deciding casevolumes.

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[2]   Assessment of European practices are based on telephone conversations with salesmen from five
      multinational consumer goods companies, a trade association and the six chains mentioned.
      Concurrence was unanimous.

The Conceptual Model

The exploration of the conceptual model begins by examining the model's heart - the relation between the volumes of products' cases and the space allocations which they receive.

Managerial Shelf Space Allocation Heuristics

While measuring DPP in six grocery chains for Ireland and Farran (1990) we were struck by the enormous quantities of on-shelf inventory found - an average of 22 days worth. As several chains delivered daily from the warehouse, such quantities seemed unnecessary for safety or buffer stock. Executives agreed and asked us for help.

We first tried to establish each chain's shelf space allocation decision rules (if any). Brief interviews with high level executives in each chains found that they were in general agreement with the shelf space allocation heuristic of American grocery executive Tom Smith, C.E.O. of Food Lion, who said, "The space he (a manufacturer) gets is dictated by his (sales) volume. It's very simple. We've got five beer distributors and 100% of shelf space (to distribute among them). If Stroh's (a beer manufacturer) does 30%, he gets 30% of the space" (Sheeline 1988). Confident that the rule was shared by all chains and clearly understood by us, we returned to the stores to determine a more efficient and enforceable decision rule as this one, obviously, resulted in overgenerous allowances.

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In-store observations were incongruent with the decision rule. Shelf space was not strictly related with sales in any of the six chains investigated. In one particular case, slow selling Scotch Whisky had more shelf space than a Spanish wine which sold one hundred times as many bottles per week. The finding that products' sales don't always determine their space allocations should not surprise. After all, Borin and Farris (1990) found that products' sales were only slightly related to their shelf space allocations ($R^2=0.07$).

Store managers were questioned about space allocation procedures. One offered that he couldn't allocate space as he wanted because he couldn't reduce space allocation below one case. Sequential discussions with one store manager from each of the six chains, together with daily in-store observations of shelf allocation practices by research assistants, led to the development of three shelf space allocation heuristics which did indeed seem to be followed across the six chains.

The first heuristic was that, as the minimum order quantity is the casecount, each product will receive at least one casevolume of shelf space where the casevolume equals the product of the casecount and volume (cubic inches) per unit. Higher casecounts thus force grocers to increase on-shelf inventories and space allocations (equation 1).

$$\text{Space Allocation} = \text{safety stocks} + \beta(\text{Casevolume}) \qquad (1)$$

$$\text{s. t.} \quad \text{Sales/Delivery} \leq \text{Casecount}$$

Products can "earn" more than one casevolume of shelf space through higher sales. Specifically, for those products which sell more than one case between

deliveries, the shelf allocation will not be less than the unit sales between deliveries (equation 2).

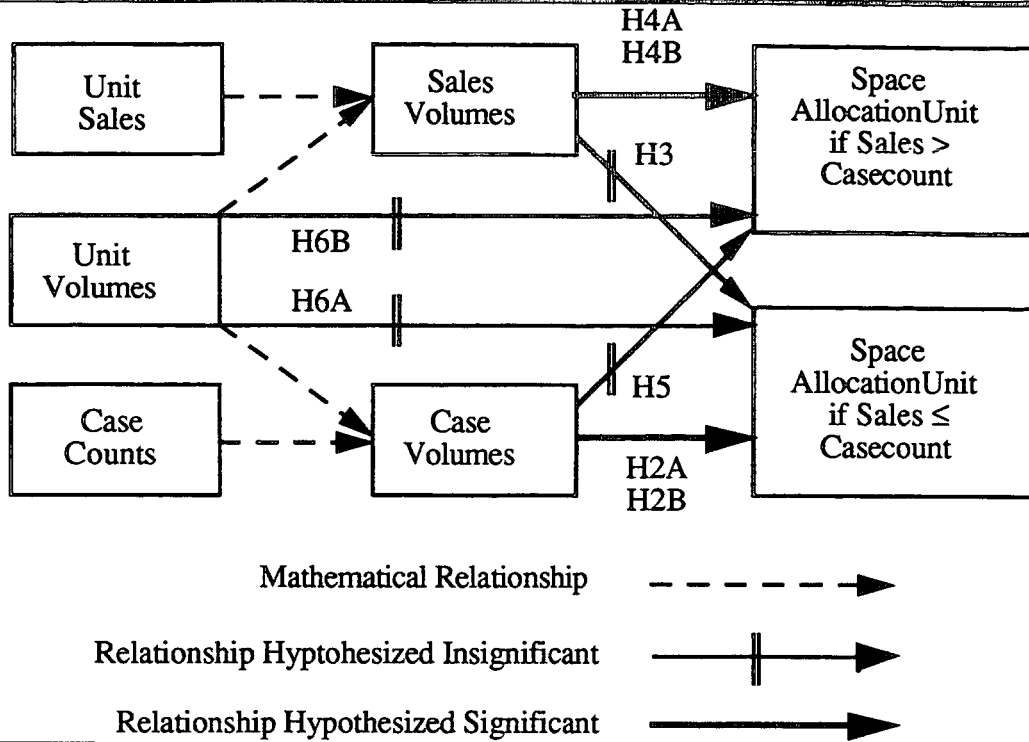$$\text{Space Allocation} = \beta(\text{Salesvolume}) + \text{safety stocks} \qquad (2)$$

$$\text{Where Salesvolume} = \frac{\text{Unit Sales/Week}}{\text{Deliveries/Week}} \times (\text{Volume/Unit})$$

$$\text{s. t.} \quad \text{Sales/Delivery} > \text{Casecount}$$

The third rule was that safety stocks may be held beyond these minimum amounts to protect against stockouts caused by sales volatility. These safety stocks are not considered further as there seems to be no reason to believe that they vary with case counts nor with sales but rather with volatility or unpredictability of sales. The heuristics developed in each chain by the store manager were shown to top executives in the same chain who readily agreed that these rules better represented reality than the rules which *they* themselves had developed. They also agreed that casecounts - determined unilaterally by manufacturers - were taking space allocation decisions out of their hands but did not consider this to be an important topic for further study. As one said, "Why confirm what you can't control?"

Equations 1 and 2 together form the conceptual model, drawn in Figure 1.

Figure 1
The Conceptual Model And The Research Hypotheses

| | | H4A |
| | | H4B |

Unit Sales → Sales Volumes → Space AllocationUnit if Sales > Casecount

H3

Unit Volumes   H6B   H6A

Case Counts → Case Volumes → Space AllocationUnit if Sales ≤ Casecount

H5

H2A
H2B

Mathematical Relationship   – – – – – →

Relationship Hyptohesized Insignificant   ——|——►

Relationship Hypothesized Significant   ════►

Several hypotheses may be drawn from equations 1 and 2. First, equation 1 and 2 together posit that at least one casevolume of each product will be present on the shelf, regardless of sales or delivery frequency leading to hypothesis 1:

H_1 All products will have space allocations greater than one casevolume regardless of their sales between deliveries.

More specifically, equation 1 indicates that products' space allocations should increase with their casevolumes if the units sold between deliveries is less than the case count, thus:

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H$_{2A}$ The casevolume will be positively related with space allocations for products which sell one case or less between deliveries.

Sawyer (1983) suggested that researchers hypothesize coefficients of regressions as well as their signs if possible. To this end, the same store managers were reinterviewed. All stated that they determined minimum space allocations as two casevolumes. They reorder from the warehouse when the first case sells so there should always be between one and two cases on the shelf plus the safety stock. The coefficient of a regression between the casevolume and the space allocation - β from equation 1 - should thus be greater than one and less than two for products which sell less than one case between deliveries. This supposition is tested in H$_{2B}$.

H$_{2B}$ The coefficient of the regression between casevolumes and space allocations will be greater than one and less than two for products which sell one case or less between deliveries.

Equation 1 also suggests that casevolumes should only predict space allocations for products which sell less than one case between deliveries, thus:

H$_3$ The casevolume will not covary with space allocations for products which sell more than one case between deliveries.

The second space allocation heuristic presented was that space allocations increase with unit sales for products which sell more than one case between deliveries. Equation 2 clarifies this rule and yields two testable hypotheses. First, hypothesis 4 tests the contention that a positive relation exists between salesvolumes and space allocations:

H_{4A} The salesvolume will be positively related with space allocations for products which sell more than one case between deliveries.

The coefficient of the regression between salesvolumes and space allocations - β from equation 2 – is more difficulty predicted. The beta should equal one *if* casevolumes are not significantly related with space allocations and if the elasticity of sales to space is zero. More space, however, should produce higher sales thus:

H_{4B} The coefficient of the regression between salesvolumes and space allocations should be greater than one for products which sell more than one case between deliveries.

The final testable hypothesis derived from equation 2 is that salesvolumes should only predict space allocations for products which sell more than one case between deliveries:

H_5 Salesvolumes will not be related with space allocations for products which sell less than one case between deliveries.

Finally, a contending explanation for covariance between either casevolumes or salesvolumes and space allocations is that both salesvolumes and casevolumes are multiples of products' volume (hereafter unit volume). Any observed relationship between casevolumes or salesvolumes and space allocations could be explained as an underlying and intuitively obvious relation between big products and large space allocations. Hypothesis 6 is therefore proposed as a two part confounding test: one part for low selling products, the other for high.

H_{6A} The unit volume will not be related with space allocations for low selling products.

H_{6B} The unit volume will not be related with space allocations for high selling products.

The research hypotheses are drawn on Figure 1.

Casecounts And Grocers' Profits

If larger casevolumes do lead to increased space allocations in the sample tested, the question arises if increased shelf space per product is beneficial or detrimental to grocers. The answer depends upon 1) the relationship between casecounts and grocers' profits and 2) whether or not manufacturers vary casecounts appropriately so as to maximize grocers' profits. This relationship will be explored below.

Grocers' Revenues as a Function of the Casecount

A store's revenue may be expected to increase with the available shelf space and with the variety of products carried. That is to say that big stores should sell more than small stores and that stores with more stock keeping units (SKUs) should sell more than stores with fewer. Since shelf space is limited, increasing the shelf space allocation per SKU requires a proportional reduction in the number of SKU offered. If larger casevolumes increase the shelf space per SKU for products which sell less than one case between deliveries then larger casevolumes will reduce the number of SKU which may be carried.

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The reduction in the number of SKU forced by large casevolumes will lead to a corresponding reduction in store revenue given the minimal assumption that the elasticity of grocers' revenue to the number of SKU is greater than it is to Space per SKU. This proposition seems self-evident as otherwise stores would carry only one product. Thus, grocers' revenue should be a decreasing function of the casecount to the extent that over-high casecounts increase the space allocated per SKU thus limiting the variety stocked.

Grocers' Costs Associated With The Casecount

Grocers' costs associated with the casecount may be usefully segregated into those which decrease with the order quantity (order costs) and those which increase (holding costs).

Order costs are the costs associated with renewing on-shelf inventory as the product sells. Order costs include keying orders into hand held computers, selecting products one case at a time in the warehouse, opening cases in the store etc. The two key points to understand about order costs are: 1) order costs are fixed per order so that increasing the order quantity decreases the cost per unit ordered and 2) high casecounts increase order quantities for low selling products thus reducing order costs per unit.

Contrary to order costs, grocers' holding costs increase as higher casecounts increase the space allocation per SKU and thus the "average units held" on the shelf

(see equations 4 and 5). It is useful to divide holding costs into two classes: financial costs and space costs.

Financial holding costs are the opportunity costs of tieing up funds in on-shelf inventory (clarified below in equation 3). Calling financial holding costs per period C_f, the interest rate per period i and the wholesale price per unit P:

$$C_f = i\ P\ x\ (Average\ Units\ Held) \tag{3}$$

Where average units held is one half of the space allocation divided by the volume per unit (see equations 1 and 2).

Space holding costs, also known as occupancy costs, refer to store costs which can not be allocated to a particular product on a more directly causal basis. Space costs include, for example, electricity, depreciation and the store manager's salary. DPP models (AECOC 1989) allocate these costs to products based on the cubic meters (M^3) of shelf space which they occupy. Calling space holding cost per period C_s, and products' unit volume V, space costs per period are as in (4).

$$C_s = \frac{Space\ Cost}{M3/Period}\ x\ V\ x\ Average\ Units\ Held \tag{4}$$

The Casecount Which Maximizes Grocer's Profits

The optimal casecount for maximizing retailers' profits doubtless varies from chain to chain and from store to store within a chain. However, the optimal casecount

for a given SKU and chain increases with the product's unit sales per period because higher unit sales increase order costs. The optimal casecount decreases with products' bulk (from equation 5) and price (from equation 4) as these increase holding costs. Rephrasing the above, profit maximizing retailers will prefer lower casecounts for products with lower sales, greater volume or higher prices.

Do Manufacturers' Vary Casecounts to Minimize Grocers' Costs?

If manufacturers are not paying attention to grocers' costs when determining casecounts then existing casecounts will not vary appropriately with sales, prices and volumes and thus fail to maximize grocers' profits. However, given that market sensitive manufacturers' should produce products which maximize their clients' profits, it is hypothesized that manufacturers increase products' casecounts in relation to sales and decrease them in relation to products' prices and volumes. These contentions are formalized as hypothesis 7.

H7   Actual casecounts will vary so as to maximize retailers' profits. Specifically:

        H7A   Casecounts will vary positively with products' unit sales.
        H7B   Casecounts will vary negatively with products' prices.
        H7C   Casecounts will vary negatively with products' volumes.

Method

Sample Considerations - The Store and The Products

Testing hypotheses 3, 4A, 4B and 6B requires a substantial number of SKU whose sales per delivery are greater than one casecount. Only one of the six chains investigated had more than 50 SKU selling more than one case per delivery. Empirical product and sales data for an entire year were collected from one store of this chain - a limited variety store with only 900 SKU selling about \$100,000/month (\$111.11/SKU/month). Deliveries are made to the store from the warehouse twice weekly.

Products which do not come in cases, such as bread, were removed from the sample. Seasonal products were eliminated because their average space allocations for the year could not be determined *ex post*. These considerations reduced the sample to a still ample and carefully selected 583 SKU.

Results

Hypothesis 1 postulated that all products would have more than one casevolume of shelf space. In fact, only 8 of 583 (1.3%) of all SKU's had less than one casevolume of shelf space. Thus, H_1 is rejected but the evidence supports the contention that casevolumes generally set minimum space allocations.

Hypotheses 2 - 6 can be construed as suppositions as to which terms will be significant and what their coefficients will be in the multiple regression equation: Space Allocation = a + b(Casevolume) + c(Salesvolume) + d(Unitvolume). The hypotheses are contingent upon whether a product's unit sales between deliveries are greater than its casecount. The constant "a" is considered to represent safety stocks held due to sales volatility, however, in the absence of time series data, the relation between "a" and sales volatility can not be tested.

Low Selling Products

To test hypotheses 2A, 2B, 5 and 6A; those hypotheses which pertain to products selling less than one case between deliveries, all products selling more than one case between deliveries were removed from the sample. A multiple regression analysis was then conducted using casevolumes, Salesvolumes and unit volumes as independent variables and space allocations as the dependent variable. Including all independent variables in the regression controls for the considerable covariance among salesvolumes, unit volumes and casevolumes (Wildt and Ahtola 1978). Concern was expressed by reviewers over the possibility of multicolinearity invalidating the estimates of the regression coefficients because the independent variables unitvolume, casevolume and salesvolume all contain the term "unit volume". However, multicolinearity is only a problem if one variable is *linearly and perfectly* related to another (Achen 1982 p. 35). Since neither sales per SKU nor units per case are constants, multicolinearity was not a problem. Moreover, shared covariance among independent variables does not distort the regression coefficients

estimated, it just increases standard errors as would reducing sample size (Achen 1982 p. 35).

The results of the multiple regression are presented in Table 1. The R^2 for the multiple regression was .812, showing that the independent variables together explain the vast majority of the variance in space allocations for low selling products. "Casevolume" was significant at p=.001, fully supporting hypothesis 2A. Moreover, the beta for "Casevolume" was 1.43, which falls within the bounds specified by hypothesis 2B. The standard error for casevolume was very low.

Table 1
Multiple Regression Analysis Between Casevolumes, Salesvolumes, Unit Volumes and Space Allocations For Low Selling Products

	Coefficient	Standard Error	Partial F Score	P	Hypoth- eses	Support
Intercept	23354.00					
Casevolume	1.43	0.08	287.18	.001	2A, 2B	Yes
Salesvolume	.99	0.14	58.60	.001	5A	No
Unitvolume	.25	0.81	0.09	.761	6A	Yes

Adjusted R^2 =.812, df = 533

Hypothesis 5 posited that salesvolumes would not covary with space allocations for low selling products. While "Salesvolume" was, as shown in Table 1, significantly related with space allocations (p=0.001) refuting hypothesis 5, "Casevolume" explained five times more variance than did "Salesvolume". A contending explanation for the relationship observed between "Salesvolume" and space allocations is that larger space allocations yield greater sales, not vice-versa. If one believes that managers follow the decision rules rigidly, then the relationship

between "Salesvolume" and space allocations is a measure of the elasticity to sales to space.

"Unitvolume" was insignificantly related with shelf space allocations supporting hypothesis 6A. Together, these findings indicate that casevolumes, rather than unit volumes or salesvolumes, are the main determinant of space allocations for products which sell less than one case between deliveries and which are delivered in boxes. These products make up 91% of the products in this sample and a greater percentage of SKUs in other chains. A split-half reliability test showed no significant differences.

High Selling Products

The hypotheses pertaining to space allocations for products selling more than one case between delivery (hypotheses 3, 4A, 4B and 6B) were tested after eliminating low selling products from the sample. Hypothesis 4A postulated that salesvolumes determine space allocations for products which sell more than one case between delivery. Hypothesis 3 and hypothesis 6B posit, respectively, that neither casevolumes nor unit volumes determine space allocations for these products.

The results of the multiple regression are presented in Table 2. "Salesvolume" is significantly related with space allocations for high selling products (p<.001) supporting hypothesis 4A. As postulated by hypothesis 4B, the coefficient was greater than one (1.26) "Casevolume" was,as posited by hypothesis 3, insignificantly related with space allocations (p=.119). However, "Unitvolume" was significantly and

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negatively related with space allocations falsifying hypothesis 6B. While hypothesis

6B is rejected, "Unitvolume's" negative coefficient makes it clear that "Salesvolume"

is the determinant of minimum shelf allocations for high selling products. Why should

bigger products receive smaller space allocations after controlling for casevolumes and

salesvolumes? Frankly, it's not clear.

Table 2
Multiple Regression Analysis Between Casevolumes, Salesvolumes, Unit Volumes and Space Allocations For High Selling Products

	Coefficient	Standard Error	Partial F Score	P	Hypotheses	Support
Intercept	29617.60					
Casevolume	.79	0.50	2.52	.119	3	Yes
Salesvolume	1.26	0.27	28.10	.001	4A, 4B	Yes, No
Unitvolume	-5.53	2.16	6.59	.013	6B	No

Adjusted R^2=.846, N=50

A split half reliability test found that the model's predictive power and the

results of the hypotheses test were consistent in both halves.

The results of the hypotheses tests generally support the conceptual model.

Specifically, the relation between casevolumes and space allocations behaved as

postulated. It covaried with space allocations for low selling products but not with

high selling products as predicted. Casevolumes explained 72% of the variance in

space allocations among low selling products.

Having validated the model's premise that casevolumes influence space

allocations for low selling products, the next step will be to test if manufacturers

determine their casecounts decisions to maximize retailers' profits.

Do Manufacturers Tailor Casecounts for Grocers' Costs?

In a regression equation, "Volume/Unit", "Unit Sales" and "Unit Price" can be considered as independent variables predicting the dependent variable "Units/Case". Hypotheses 7A - 7C thus suggest that the regression coefficients for "Unit Sales" will be positive while the coefficients for "Volume/Unit" and "Unit Price" will be negative. All independent variables were included in the regression to control for shared variance. Scattergrams showed that Price and Volume were related non-linearly with casecounts. The relation seems to be that very large and costly products (the two go together) have low casecounts. However, low priced, small products' casecounts run the gamut from three to 96 units per case. Consequently, independent variables were coded as dummy variables where one represented the upper half "big" or "costly" and zero the lower. The results are presented in Table 3.

Table 3
Multiple Regression Analysis Between Unit Sales, High and Low Prices and Unitvolumes and Casecounts

	Coefficient	Standard Error	Partial F Score	P	Hypoth- eses	Support
Intercept	27.50					
Unit Sales	0.01	0.006	3.24	.072	H7A	No
Unit Price ($)	-7.85	1.051	55.85	.001	H7B	Yes
Volume/Unit (c^3)	-7.28	1.024	50.40	.001	H7C	Yes

Adjusted R^2 = .212, df=579

Analyzing the data presented in Table 3, it can be seen that "Unit Sales" was positively and significantly related to casecounts and that both "Unit Price" and "Volume/Unit" were negatively and significantly related (p=.001) with the number of units per case. Thus, hypotheses 7B and 7C are supported while hypothesis 7A is

lightly rejected. A split half reliability test showed no important differences between the halves.

It seems that manufacturers do indeed vary casecounts in a manner which reduces grocers' costs. The evidence indicates, however, that there may be other factors involved in manufacturers' casecount decisions. Although the relations between "Unit Price" "Unit Sales" "Volume/Unit" and casecounts are significant, they are not very important: the multiple R^2 was only .212. An alternative interpretation of the regression could be that manufacturers select an average casecount of 27 and don't vary it much. However, the standard deviation of casecounts was 13 indicating that casecounts do vary widely, but not linearly with the independent variables tested.

It remains unclear as to whether manufacturers vary casecounts with products' prices and volumes to lower their own costs of handling and inventory or are client motivated. Sales, a factor which only affects grocers' costs, is only slightly related with the casecount which may hint that casecounts are motivated by manufacturers' rather than clients' costs.

Conclusions And Discussion

It seems safe to conclude from the above empirical findings and theoretical analysis that, in the absence of backrooms, casecounts drive space allocations for the vast majority of products, thus taking this decision out of grocers' hands. Further, manufacturers do not take products' sales into account when developing casecounts though they do reduce casecounts for bulky, expensive products.

Implications For European Marketing Managers

The war among manufacturers for shelf space is now world wide. Manufacturers offer "slotting fees" and allowances to purchase shelf space (Thierren 1989, Hume 1988) and their sales forces dedicate much of their time and energy to obtaining more space (Crouch and Shaw 1989). However, the findings presented here indicates that none of these efforts achieve greater space allocations. If the product gets in the store, it receives 1.4 casevolumes of space. To receive additional space, it must sell huge volumes. Perhaps sales forces should spend more of their efforts on getting their products *into* stores and getting the *best* space rather than obsessively chasing more space.

On the other hand, a golden opportunity exists for manufacturers to obtain more shelf space without greater effort. As space allocations were found to increase at a rate of 1.4 times the casevolume, *manufacturers can obtain more shelf space through the simple device of increasing casevolumes.* This greater space allocation per SKU will force grocers to decrease the number of SKU carried thus increasing the market

share of the products which remain - probably the leaders (Farris, Olver and De Kluyver 1989).

However, rather than manipulating grocers, manufacturers can seize the strategic opportunity to obtain bargaining leverage by giving *real* value to grocers in the best marketing tradition. Randall (1990) suggested that this may be accomplished by "shrink wrapping sub-units within the tray (fours, sixes, etc.) to match facing requirements" or by "altering the size of 'outers' (cases) or traded units to fit the customer's shelf".

Implications for European Grocers

Grocers may be severely prejudiced by over-high casecounts where these lead to an increase in shelf space allocation per item or, in stores with back rooms, an increase in back room inventory. Grocers should take the initiative themselves rather than waiting patiently for manufacturers to solve their problems. After all, grocers are in the best position to know their costs and are therefore in the best position to suggest ideal casecounts, perhaps using trade associations as mediators. Retailers should also consider options for eliminating the link between casevolumes and shelf space allocations such as "breaking" - opening cases in the warehouse then delivering to the store in individual units - or the use of back rooms.

Implications For American Marketers: Customize Don't Standardize

Europe is heterogeneous. Some chains resemble US supermarkets: they have backrooms and broad product lines (Tesco, Safeway and Sainsbury in Britain and Mercadona in Spain). Others, such as Aldi in Germany and Dia and Charter in Spain have enormous turnovers due to their low margins and limited assortments. Still others - hypermarkets - have assortments and sales similar to US style warehouse stores. Most chains outside of Britain have two things in common: they put at least one case of each product on the self and *they have just one choice of casecount per SKU*. The result is that 1) the European channel is probably less efficient than the US and 2) the consumer pays for it.

Where backrooms are present, as in Britain, grocers would surely enjoy customized casecounts for the same reasons their Yankee cousins do. Where backrooms are not used, or where one case stocking rules exist, the current research demonstrates that optimizing casecounts can allow grocers to determine space allocations more freely.

American manufacturers often brag about their marketing attitude, "the customer is king" and the joys of relationship marketing are trumpeted in the pages of the practitioner press. Yet here we have an entire continent where no manufacturer offers the client a product attribute which he would surely value: customized casecounts. One can but wonder why the American manufacturers present - marketing giants all - don't offer US levels of service.

Directions for Future Research

This research demonstrates that casecounts drive space allocations in the absence of backrooms thus affecting both grocers' and manufacturers' profits. The current research, however, suffers from two major limitations.

The first limitation of the current research is that the costs of suboptimal casecounts have yet to be quantified. Determining these costs will require that optimum casecounts be calculated, perhaps using a DPP methodology (AECOC 1989) for a representative variety of products and store classes. Grocers' costs with optimized casecounts may then be compared to actual costs and the costs of suboptimality be determined. The data collection and processing required is daunting but should be undertaken.

The second problem with the current research is that the data came from a single period. Unexplained variance in space allocations were taken to be safety stocks. However, time series sales data will be needed to determine the influence of sales volatility on safety stocks. Moreover, data should be sought from grocers with back rooms to determine the effects of casecounts on grocers' costs when back rooms are used.

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