

MEASURING THE EFFECT OF CUSTOMER SERVICE LEVEL

John A. Murray; Sean A. MacEntee.*

INTRODUCTION

Customer service level is a factor which is not very extensively explored in the marketing literature. An emphasis on its analysis is to be found primarily in work concerned with the analysis and design of logistics systems. One result of this is that customer service level is most often defined in terms of delivery time or stock availability.¹ This is, however, a very limited notion of service level. Hutchinson & Stolle have noted that apart from a concern with the typically physical distribution features of service, the consumer is also concerned with issues such as:

1. Frequency of salesman's visits to check customer needs,
2. Ordering convenience,
3. Order progress information (acknowledgement of order, etc.),
4. Inventory back-up during promotions, new product introductions etc.,
5. Format and organisation of invoice.²

Stephenson & Willet have suggested additional factors such as the condition of goods on their receipt by the customer, claim procedures and billing accuracy and efficiency.³ Customer service is therefore quite a complicated concept involving many issues other than those solely related to physical distribution. It is also a factor which most empirical studies have shown to be an important determinant of marketing success, especially for industrial products and in organisational buying situations.⁴

This paper reports some results from a study of the relative importance of customer service level compared with other marketing variables, and of the relationship between customer service level and market share.⁵ The context chosen for the research was the purchasing decision of contrasting retailers. Three contrasting product groups were selected — domestic electrical appliances, paints, and cigarettes — in order to explore the hypotheses that the importance of customer service level as a consideration in the buying decision would vary by product type, and

* Dr. John Murray is a lecturer in Marketing at University College, Dublin, Mr. Sean MacEntee is Business Adviser with the Irish Productivity Centre.

that the importance of the constituent features of service level would also vary from one product group to another.

DESIGN OF THE STUDY

The focus of the research was therefore on the purchasing decision of retailers as they bought goods from various manufacturers and suppliers. The three product groupings studied were chosen to test the hypothesis that they would provide evidence of the use of different purchase criteria by the retailers and of differing emphasis in the marketing strategies of their suppliers. Within the three product groupings, a selection of prominent brands was chosen for detailed investigation (see Table 1).

TABLE ONE:	
Product Group	No. Brands Studied
1. Cigarettes:	3 Brands
2. Paint:	3 Brands
3. Domestic— Electrical appliances:	
Cookers	3 Brands
Foodmixers	3 Brands
Washing Machines	3 Brands

A sample of fifty retailers was selected as shown in Table 2. The population of interest was limited to the Dublin – Dun Laoghaire area.

TABLE TWO:			
	Grocery Tobacconist & Newsagent	Hardware	Electrical
Total Population*	1657	181	151
Sample Size	15	20	15
Sample % of Population	1%	11%	10%
*This is the total population of retail establishments in Dublin and Dun Laoghaire as determined by the 1971 Census of Distribution.			

The fifty respondent retail establishments were chosen, using a table of random numbers, from the 1976 edition of Thoms Commercial Directory as the universe listing. The retailers were contacted individually and forty-eight agreed to cooperate with the research. They were then interviewed personally using a very structured questionnaire. Respondents were the persons having most contact with suppliers. In larger stores, department managers were usually the appropriate respondents, while in smaller establishments the proprietor was usually interviewed.

The specific purpose of the study was two fold:

- (a) to examine the relative importance to retailers of customer service level, compared with the other aspects of supplier marketing strategy such as price, promotion and product quality, and,
- (b) to examine the relative importance to the retailers of the factors which go to make up the service level provided to them by their suppliers.

In addressing the first purpose of the study, marketing strategy was defined in terms of suppliers' performance on four factors — price, promotion, product quality and customer service. These four variables taken together are subsequently referred to as the marketing mix. Customer service was further decomposed into thirteen subsidiary components, so that their relative importance could be explored. These thirteen customer service variables are listed below and are subsequently referred to as the customer service mix:

Delivery Reliability	Ease of Contact	Credit
Speed of Delivery	Prompt Quotation	Discount
Point of Sale Material	Sales Representation	No Order Size Constraint
Guarantee	After Sales Service	Inventory Reliability
		Quality of Goods Received

In order to examine the importance of the various marketing and customer service mix factors to the retailer in making his decision to stock certain products it was decided to proceed in this exploratory study by measuring the *perceptions* of the retailers. Two measures of perception were therefore taken:

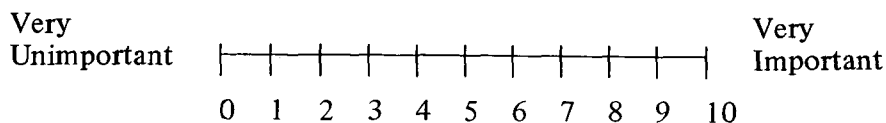
- (a) the retailer's perception of the importance to him (in making his decision to purchase stock) of each of the four marketing mix and thirteen customer service mix variables;
- (b) the retailer's perception of the performance of each of the suppliers chosen for study along each of these same variables.

The measures taken were therefore intended to generate both retailer preferences, and perceptions of actual performance.

The final measurement task was to collect data on the market share of each of the product brands studied as evidenced by their share of the retailers sales of the relevant product group. This data then provided a basis for analysing the relationships between suppliers' marketing performance and their market share.

RETAILER'S PERCEPTIONS OF THEIR SUPPLIERS' MARKETING STRATEGY

The findings of the study indicate the preferences which retailers have for the various elements of their suppliers' marketing mix. Retailers were asked to note on a scale such as that shown below the importance to them in making a decision to stock a brand of each of the marketing mix and customer service mix factors.



The general findings suggest that, for electrical and cigarette retailers, customer service is the most important aspect of the suppliers' marketing mix while price is most important for paint retailers. Table 3 illustrates these findings.

TABLE THREE: Relative Importance to the Retail Purchaser of Elements of the Supplier's Marketing Mix

	All Retailers		Electrical		Paint		Cigarettes	
	Mean Score	Rank	Mean Score	Rank	Mean Score	Rank	Mean Score	Rank
Price	8.31 (1.45)	2	9.02 (0.91)	2	8.84 (0.95)	1	6.85 (1.40)	3
Quality	7.29 (1.78)	3	7.35 (1.27)	3	6.89 (1.94)	4	7.80 (1.96)	2
Customer Service	8.53 (1.85)	1	9.35 (1.00)	1	8.37 (1.92)	2	7.93 (2.20)	1
Promotion	6.87 (1.67)	4	6.85 (1.35)	1	7.15 (1.50)	3	6.50 (2.17)	4
NOTE: Scores are on a scale of 0 = Very Unimportant to 10 = Very Important. Standard Deviation is shown in parenthesis after each mean score.								

Retailers' perception of the importance to them of the various elements of customer service are shown in Table 4. The consistently high value attached to the quality of goods when they are received by the supplier is interesting to note. When considered with the perceived importance of delivery reliability it emphasises the importance of the physical distribution elements of the customer service mix. The contrast between

the importance attributed to speed of delivery versus delivery reliability suggests that retailers respond more favourably to certainty about delivery time rather than absolute speed of order filling and delivery.

TABLE FOUR: Rank Order of Importance to Retail Buyers of the Elements of the Supplier's Customer Service Mix*

	All Retailers Rank	Electrical Rank	Paint Rank	Cigarettes Rank
Delivery Reliability	2	6	4	2
Speed of Delivery	10	13	6	5
Point of Sale Material	11	10	8	9
Guarantee	4	3	5	7
East of Contact	8	4	8	8
Prompt Quotation	12	8	10	10
Sales Representation	9	11	7	6
After Sales Service	5	1	5	11
Credit	6	7	9	3
Discounts	3	5	2	4
No Order Size Constraint	13	12	11	9
Inventory Reliability	7	9	3	8
Quality of Goods Received	1	2	1	1

*Two or more factors may be ranked equally.

THE RELATIONSHIP BETWEEN SUPPLIERS' MARKET SHARE AND THEIR PERCEIVED MARKETING PERFORMANCE

When retailers' preferences for the various factors which characterised their suppliers' marketing activity had been measured the research next turned to measuring the retailers' perception of how well each supplier actually performed on each of the same factors. Information was therefore generated on both the "ideal" level of performance and on the suppliers actual level of performance.

Suppliers performance could then be measured in terms of the "distance" between their actual and preferred level of activity on each marketing variable. This measure was termed a variance score and was calculated for each supplier along each of the seventeen variables studied. In summary, the variance score may be written as:

$$\sum_{i=1}^n (x_i - y_i)$$

where x_i = Retailers' preference level on each marketing factor

y_i = Retailers' perception of supplier performance on each marketing factor.

Both a marketing mix score and a customer service mix score was calculated, the former using the four marketing mix variables and the latter using the customer service mix variables.

The measure of supplier market share performance was developed by establishing the percentage of the retailers sales attributable to each supplier brand and subtracting an "expected" market share figure. For example, if five paint suppliers had observed market shares as shown in column (1) below, then the expected share of 20% as shown in column (2) was subtracted, giving a Market Share Score as in column (3):

	(1) Observed %	(2) Expected %	(3) Score
Paint Supplier 1	30	20	10
Paint Supplier 2	20	20	0
Paint Supplier 3	15	20	-5
Other Suppliers	35		

When the relationship between the marketing mix scores and market share score was analysed, a high degree of correlation was found for paint and for most electrical suppliers. A negligible degree of association was found for cigarette suppliers (see Table 5).

TABLE FIVE: Correlation coefficients between Market Share Score and Marketing Mix Score.

Supplier	
Electrical 1	0.13
Electrical 2	0.99
Electrical 3	0.81
Electrical 4	0.40
Electrical 5	0.02
Electrical 6	0.92
Electrical 7	0.46
Electrical 8	0.35
Electrical 9	0.85
Paint 1	0.66
Paint 2	0.90
Paint 3	0.68
Cigarette 1	0.02
Cigarette 2	0.05
Cigarette 3	0.01

The correlation coefficients shown indicate the degree of linear relationship between the two factors market share score and marketing mix score. The very low correlation in the case of cigarette suppliers may indicate that this is a product class for which final consumer demand is the overwhelming determinant of a retailer's decision to stock. The relatively high correlations in the case of paint and electrical products, on the other hand, suggest that the retailer plays an important role in determining final sales of a supplier's brand and that his role is influenced by the supplier's strategy.

In addition to looking at the association between the overall marketing mix performance of suppliers and their market share, an analysis of the relationship between the components of marketing mix and market shares was also undertaken (Table 6). This suggests that the four components of marketing mix are associated in quite a contrasting manner with market share. The particularly weak results for promotion for all product categories is noteworthy. Price emerges as the variable most strongly associated with market share although none of the partial correlation coefficients is very high. The problem of assuming a linear relationship may account for some of this weakness.

TABLE SIX: Association between Market Share and Performance on the Marketing Mix Variables.

	ELECTRICAL	PAINT	CIGARETTE
	Partial Correlation Coefficient	Partial Correlation Coefficient	Partial Correlation Coefficient
Price	.31*	.27*	.21
Quality	.18*	.02	.28*
Customer Service	.17*	.30*	.25*
Promotion	-.006	.20	.08
*Significant at the 5% level using a Student's t test			

When the individual elements of customer service explored in the study are introduced to the analysis, the relationship between market share and customer service level alone may be further explored. Quite a high degree of correlation is found in the case of several of the electrical and paint suppliers while virtually no linear association at all is evident in the results for cigarette suppliers. This latter finding is somewhat in contradiction of that reported above for the general measure of customer service as an element of the marketing mix and seems to arise

primarily from weaknesses in the specification of the individual variables considered to contribute to the general concept of customer service.

TABLE SEVEN: Correlation Coefficients between Market Share Score and Customer Service Mix Score.

Supplier	
Electrical 1	0.20
Electrical 2	0.99
Electrical 3	0.90
Electrical 4	0.40
Electrical 5	0.03
Electrical 6	0.92
Electrical 7	0.46
Electrical 8	0.33
Electrical 9	0.84
Paint 1	0.65
Paint 2	0.90
Paint 3	0.69
Cigarette 1	0.00008
Cigarette 2	0.03
Cigarette 3	0.007

This criticism of the model used is supported by the partial correlation analysis. When each of the components used to define customer service level is examined, partial correlation coefficients which are significant at the 5% level are found only for speed of delivery and sales representation in the case of electrical and paint suppliers, and discounts in the case of paint suppliers. Significant correlations in these cases are intuitively logical, but the general absence of strong association raises interesting questions about how in fact the dimensions of customer service should be specified and about the assumptions of linearity which were used in the present study.

TOWARDS A SALES RESPONSE FUNCTION

The ideal outcome of an investigation of this nature would be the specification of a predictive relationship between customer service and some dependent variable such as profit, sales or market share.

Because of the exploratory nature of the study, the findings are not in fact very robust. In order to develop a regression model it would have been desirable to have supplier data of an objective and verifiable nature on the variables studied. The research however concentrated on

retailer perceptions of performance on these variables, giving measurements that are useful and indicative but not very powerful. The data collected have been used in a linear multiple regression model. The highest R^2 found was 0.42 in the case of the data on paint suppliers, indicating that 42% of the variation in their market share could be explained by the seventeen independent variables. However, even in this case the individual regression coefficients are small and several are negative, indicating that the model as well as the data needs re-specification. It is possible to re-specify the model used so as to minimise intercorrelation between variables and to test a logarithmic rather than linear hypothesis about the response function involved.

The results of this part of the research therefore suggest the possibility of developing a sales response function for customer service based on more robust data and testing the relevance of a logarithmic sales response curve as has been suggested elsewhere.⁶

In general, the study provides a basis for continued investigation of the effect of customer service level as an important element of marketing strategy. It highlights the need to move on to the use of more precise and objective data. It is also clear that the most satisfactory approach to further research would be through the use of an experimental research design.

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