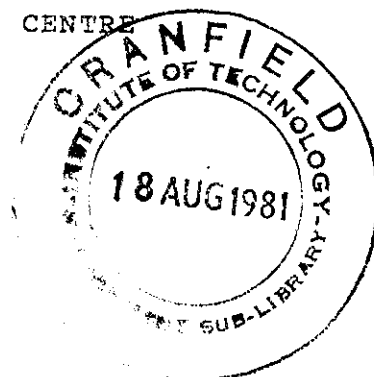


MARKETING COMMUNICATIONS RESEARCH CENTRE

THE SETTING OF ADVERTISING
BUDGETS



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E X E C U T I V E S U M M A R Y

This report summarises the contributions made by economists, management scientists and practitioners to the understanding of how advertising budgets should be set. Each approach offers insights and guidance for certain circumstances and these are brought out in the report.

It is concluded that there is no ready substitute for understanding the marketing situation and determining the advertising requirement appropriate to the planned marketing policy. There is no formula for calculating budgets to which all situations are subject. It is shown that certain policies for setting advertising appropriations are useful to arrive at the "right order-of-magnitude" for expenditure. Different marketing circumstances require different policies and management must 'finely tune' the order-of-magnitude figure in the light of their particular circumstances and aspirations.

The procedure advocated in the report for arriving at an advertising appropriation is to use both:

- a) one of the 'order of magnitude' methods appropriate to the marketing situation (see page 70), and
- b) the 'according-to-task' method. (see page 83).

In this way the appropriation will be relevant to the financial circumstances and requirements of the company but will also be relevant to the role required to be filled by advertising in the product plan.

The report contains a summary and appraisal of probably one of the most complete listings of methods that can be used for arriving at advertising budgets.

It is shown that there is theoretical support for a constant advertising-to-sales ratio being the optimum policy for certain, mainly oligopolistic situations. However, this assumes that the right ratio can be determined in the first place.

There is one essential difference between the economists' and marketing researchers' approach to budget setting, and that of practitioners. The former advocate the principle of calculating "an ideal optimal solution" which should be modified in the light of practical circumstances to become feasible. The practitioners, on the other hand, advocate choosing "a feasible solution" to the budget problem which is developed towards becoming an optimum one. Each approach if comprehensively followed is valid; the one to be followed depends on which is most satisfactory to a particular management style.

In the conclusion to the section on Management Scientists' Contribution (page 70) guidance is given as to which 'formula' is probably appropriate to which set of marketing circumstances. This will enable an 'order of magnitude' estimate to be made for an advertising budget. In the section of the report 'Practitioners Contributions' (page 83) the advantages and disadvantages are discussed of the 'task' method.

Armed with this appreciation it is hoped that advertising budgets can be set which are pertinent to the needs of the product and the market situation, and which are also appropriate to the company's financial circumstances.

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I N T R O D U C T I O N

This report strives to achieve three main aims in relation to the problem of the determination of advertising expenditure levels:

- a) to survey and summarise the theories and authoritative opinion;
- b) to summarise the feasible, practical methods and to report and comment on the evidence for their value;
- c) to report the small, empirical study which the MCRU has conducted on information supplied by Sponsor companies on various products.

A further aim is to draw conclusions from this work and to present a practical framework for approaching the setting of advertising budgets.

The report is set out under three main headings summarising the contributions made by:

- Economists
- Management Scientists/Marketing Researchers
- Practitioners and the MCRU.

These distinctions have been drawn since it is felt that the problem is viewed from a different standpoint by each.

Economists have tended to look at the problem from a distance and attempt to formulate decision rules in terms of classical economics' criteria without too much regard for practical or managerial considerations. Their purpose is to generalise from specific examples to global solutions or statements of principle. These have a value in setting the problem in its context of the overall economic financial activities of the company and stating conditions which have to

be fulfilled for optimum budgets.

Economists writing on this subject generally assume that the effect of advertising on sales is known, or can be fairly straightforwardly assessed; they are concerned with dealing with problems of competing investments' requirements and the like. Management Scientists and Marketing researchers, on the other hand, have tried to tackle one of the key issues: establishing the effects of advertising on company performance. The statistical link, or causal process link, between advertising expenditures and eventual sales levels and profits has been explored in studies by these researchers. The process they have examined is predominantly assumed to be of the stimulus-response type. Since a response in sales level is looked for, many of these studies have been realistic enough to try to allow for the changing effects of other market mix factors such as promotional activity, distribution and the like. However, many of these studies do not take into account allowance for competitor's activity or subsequent response. Further, their analyses, based on past data, are bedevilled by their not being able to remove the fact that most advertising expenditures are linked to subsequent sales levels because that is the way most budgets are set. Nevertheless work of this nature, particularly where it has involved experimental verification, has been valuable to indicate the form of relationships between sales and advertising levels and the order of magnitude of effects in different situations.

The Practitioners' contributions surveyed have taken the pragmatic view that given it is not possible to simply assess the effects of advertising, what steps can be taken to set advertising expenditure levels in a sensible, responsible way. The MCRU has found that there are at least 17 suggested methods of arriving at advertising budgets. The predominant ones are discussed together with the reasoned views of these practical approaches to the overall problem. Also in this section the MCRU presents what would seem

to be a new and fruitful approach which has been applied in other areas of expenditure decisions where the outcome is uncertain.

Finally an analysis is presented of some information and data on the marketing of a variety of products from within the group of Sponsor Companies. This information included a/s ratios, above/below-the-line ratios and advertising expenditures together with many other salient details on the markets for the products. A summary of these statistics is presented together with some observations on the way these seem to corroborate widely held beliefs and theories. For example, it is shown that there would appear to be a relationship between a/s ratios and the proportion of a market held by 'own labels' recently, but that this was not true more than three years ago. It must be emphasised however that the data used for these analyses is in no way comprehensive enough to form conclusive findings.

The final section draws conclusions from the material reviewed and presented in the report and formulates a view on the practical framework that can be adopted for the setting of advertising budgets.

THE ECONOMISTS' VIEWPOINT

Introduction

Two principal results emerge from economists' consideration of the problem of determining optimal advertising appropriations:

- a) the 'marginal utility principle' - advertising expenditure should be undertaken up to the point where an extra pound (£) spent no longer yields more than an extra pound in profit; and
- b) the 'advertising as a fixed percentage of sales' principle - as forecast or actual sales levels change advertising expenditures should change to remain as a fixed percentage of sales.

Both these assertions are based on very simplified views of the market processes involved and these assumptions are discussed in succeeding sections. The two assertions are in fact synonymous as is also explained later. However, the value of such analyses of advertising expenditures are that if, as is the case with the fixed advertising/sales rates principle, theory accords with most practice an understanding of the theory may help predict the conditions in practice when the rule should be modified.

All the theoretical work by economists in this area assumes that the individual effect of advertising on sales or profit is known, or can be easily ascertained. This is a major limitation to the practical application of their work. However, in the conclusion to one of the well known contributions to the economists' theory of optimal advertising expenditures, Dorfman and Steiner (1953) 1601, comment on the real value of such work:

"There are grounds for doubting the economic significance of the whole business of writing down profit functions (or drawing curves) and finding points of zero partial derivatives (theoretical maxima or minima). Such devices are merely aids to thinking about practical problems and it may be an uneconomical expenditure of effort to devote

too much ingenuity to developing them. Yet such devices are aids to clear thought, and if sufficiently simple and flexible, they help us find implications, interrelationships, and sometimes contradictions which might escape notice without them."

A further reason for business management to appreciate the economists' views and assumptions has been astutely pointed out by Lind (1974) 1950:

"Unfortunately economists are anxious to give practical advice Because the practical people who take (this) advice include civil servants and the politicians for whom they work it becomes important to businessmen".

For example, it is often quoted that under conditions of pure competition, economic theory shows advertising, or promotion should be nil; e.g. Dorfman and Steiner (ibid). The usual 'proofs' of this assertion make the critical assumption that production costs per unit of output are constant, that is, there are no economies of scale. This is patently not true in many industries and the economies of scale to be gained by having a large share of the detergent market and consequently very large production plants are immense.

Hence by inductive processes and simple assumptions economic theory has tried to produce some general principles about advertising expenditure levels which apply to all situations. The real world is composed of many, very different situations each of which will require an individual modification to a general principle.

Some Definitions

Certain terms e.g. elasticity and oligopoly, are used commonly by economists, and others, and to allow their use in this report they are briefly defined in broad terms in Appendix C.

The Promotional Mix Decision

Very little has been written by economists on the promotional mix decision mainly because no major problem is perceived. If it is known what are the relative effects of different methods of promotion, be it media advertising, below-the-line or whatever, then as Stigler (1961), argued the marginal utility principle applies:

"from the viewpoint of economic analysis advertising offers no differences from other forms of productive activity. The entrepreneur will presumably purchase various selling media in such quantities that the marginal revenue of each medium equals its marginal cost, just as he selects every other productive service."

Where an organisation needs to use a variety of promotional methods, not just media advertising, the marginal principle as outlined above is inadequate because it does not allow for complementary effects. The budget for each particular promotional activity must be set with regard to other, complementary activities and not in isolation. Most economists' theories of advertising budget determination strictly relate to the circumstance where the only promotional activity is media advertising or conversely, their theories apply to the setting of the overall promotional budget.

Classical Economics - Dorfman and Steiner

Originally economists considered business decision making as involving one main variable, the quantity of production. In situations of pure competition this was the only consideration; under conditions of pure monopoly either quantity or price were assumed to be the key decisions. Later, greater attention was paid to the intermediary stages in a business and analysis was extended to include more variables, the level of which a firm could decide and control. Hence more recent economists' work has centred around the making of decisions on four main factors - the price, the quantity to be produced, the amount of promotional expenditure and the quality level of the product. Each of these main decision variables can be broken down into a series of sub-problems, for example; a total advertising budget depends on how the budget is going to be spread regionally to satisfy regional requirements; it may be desirable to sell the product at different prices in different outlets; it may be desirable to provide a range of qualities. It is usual, however, for economists to deal only with the main, macro decision variables and leave the sub-optimisation problems to operational management.

An early specific reference to an economists' determination of advertising budgets for a monopoly in a static market is that of Buchanan (1942). Similarly, Rasmussen (1952)1770, applied the basic 'marginal utility' principle to determine the optimal relationship between advertising expenditures and sales, assuming everything else remained constant. He showed that at the optimum the advertising elasticity of demand should equal the ratio of advertising expenditure to total sales revenue.

Dorfman and Steiner (1954)1601, set out to determine the optimal advertising policy taking into account the effects of the other three main decision variables, price, quality and quantity of production. Hence they assume sales in a given period of time are dependent on price, quality level and promotion. In order to make the analysis easier, Dorfman and Steiner found the optimum policy over just two of the variables at a time; for example, if the quality and production (= sales) are constant what is the best policy for price and advertising levels.

Bass et al. (1961)1951 , have commented on this work pointing out that time effects of advertising are ignored as is the effect on other parts of a company's activities:

"This is a perfectly reasonable approach if we are interested only in the profit and loss statement and not the balance sheet this (approach) is not concerned with inventory problems (or cost)"

Schmalensee (1972) 1602 , has examined and developed Dorfman and Steiner's results for both monopoly and oligopoly situations. He has emphasised that most studies do not accommodate the fact that the cost of delivering an advertisement to a target audience changes and must also be considered over time. Schmalensee's examination of this approach is both comprehensive and critically thorough.

The principal Dorfman-Steiner results can be stated as follows:

a) For a monopolist, the optimal policy is where:

$$\frac{\text{Advertising (E)}}{\text{Sales (f)}} = \frac{A.T.}{P.Q.} = \frac{E \text{ (advertising)}}{E \text{ (price)}}$$

where A = number of advertisements

T = costs per advertisement

Q = production or sales volume

P = price per unit sold

E (advertising) = elasticity of demand
in respect to advertising

E (price) = elasticity of demand in
respect to price

Hence if E (advertising) and E (price) are constant or in constant ratio then the optimal policy is a constant a/s ratio.

b) For Oligopoly Situations

Schmalensee's examination of pricing theories under oligopoly show these to be highly simplified to the extent of not usually taking into account competitive activities or responses. Similarly there appears to be no theory relating price and advertising levels in markets where products are differentiable.

If price is taken to be determined exogenously, that is, outside the direct control of the company, then it is possible to develop the Dorfman-Steiner method of determining optimum advertising policies. Schmalensee states:

"in an oligopoly situation if all cost and demand functions are the same (for each company) then the optimal advertising policy is the same as for monopoly, if monopoly pricing prevails, particularly if it is not feared or expected that competition will retaliate with increased advertising".

Baumol (1959) 1952, after extensive interviews with company executives were concluded, would seem to support these assumptions:

"in day to day decision making oligopolistic inter-dependence plays only a small role a major campaign or new product does involve some discussion of the probability of competitive response but often only the most cursory attention is paid to competitive reactions. This apparently dangerous attitude does not lead to serious difficulties (it seems) because rarely are prompt, aggressive countermoves experienced."

The MCRU's interviewing in Sponsor companies would corroborate this general view.

It can be shown (Schmalensee pp. 32-34) that the oligopoly optimal advertising policy is reducible to the one of a constant a/s ratio. Again this ratio is determined by the ratio of advertising elasticity to price elasticity.

This is perhaps not altogether surprising when one realises that a constant a/s ratio is actually synonymous with the principle of marginal revenue equalling marginal cost at the optimum. The equivalence of these two principles is demonstrated in Appendix B.

c) Conclusions

The main Dorfman-Steiner results are:

assuming,

- firms do not vary product quality
- price can vary
- advertising costs can vary (i.e. price per advertisement can change with time)
- advertising effects do not extend beyond the period in which the expenditure is made.
- advertising and price elasticities are constant

then, the optimum policy is to maintain a constant a/s ratio.

The constant a/s ratio policy is actually synonymous with the principle that optimality in advertising expenditure occurs when marginal profit just equals the marginal cost of achieving this profit. Rothman (1973) 1953, has presented a simple formula that does enable the change in marginal profit to be quickly ascertained for a change a brand share:

for a 1% change in brand share

$$\text{the change in profit} = \frac{100 (\text{marginal profit})}{(\text{average profit}) \cdot \text{brand share}}$$

These results would seem to provide a defence for fixed a/s policies particularly where it is believed the elasticities will remain constant over the range that the company, or the market, is likely to change price or advertising levels. To determine the actual a/s ratio requires knowledge of the elasticity values, which are unfortunately usually rather elusive.

Dynamic Effects of Advertising - Nerlove and Arrow

If the advertising expenditure in one time period has an effect on sales or profits at some future time as well as the current period, then the budget problem is more complex than that dealt with in the simple marginal approach of Dorfman-Steiner. One of the chief criticisms of the marginalist theories is that the findings do not relate to the possible dynamic effects of advertising. However, it is worth reflecting that in some of the circumstances of frequently purchased, low priced goods, the purpose of advertising may be simple 'reminding' or 'reinforcement' with no great carry-over effect intended. Hence the marginalist principle would be appropriate here.

In order to examine budget decisions under dynamic conditions, Arrow and Nerlove (1962) 980, postulated that advertising could be thought of as generating a stock of "goodwill", which depreciates over time. The level of sales, or profit in a period, is postulated to be related to the level of "goodwill" in that period. This theory suggests a practice of 'pulsing' advertising to 'top-up' the goodwill stock level.

If the optimum advertising expenditure is explored over a set time period by this theory it is found that the ratio of "goodwill" to sales revenue should be constant. Arrow and Nerlove's analysis applies only to a monopolist and requires that "goodwill" can be estimated. Schmalensee demonstrates that unless the relationships of sales with price and advertising are linear, it will be impossible to derive a "goodwill" measure from actual advertising expenditures; such relationships are not usually thought of as being linear. Hence the Arrow and Nerlove theory is not testable even if it were possible to limit the effects of other variables on sales.

Practicalities apart, one of the theoretical findings of the Nerlove-Arrow approach is that in the circumstances where:

there are no economies of scale in production,
price elasticity is constant,
the total market is stable,
oligopoly

the optimal advertising policy is a constant percentage of sales.

Gould (1970)1954, has examined the further condition to the Arrow-Nerlove analysis that the marginal cost of advertising will increase as total advertising expenditure increases, i.e. the cost-effectiveness of media decreases the more one spends. Under this assumption the optimal policy is not one of 'pulsing'. Instead, if "goodwill" is below the optimum, advertising spending should initially be high and then decline; if "goodwill" is unnecessarily high to start off with, then advertising should build up gradually so over the time periods considered, "goodwill" and consequent sales average out to the maximum possible.

Further criticisms that could be levelled at the Nerlove-Arrow type of analysis is that although it allows for delayed effects of advertising it does not allow the possibility that sales levels may also be influenced by:

- past purchases,
- past prices,
- other time dependent factors,
- competitive effects

In other words, many other influences may be time dynamic as well as advertising.

Schmalensee has formulated an approach which allows "goodwill" to be related to past prices and past sales revenues as well as advertising expenditures. His analysis shows that if short run and long run elasticities for price and advertising are distinguished the basic Dorfman-Steiner principle is again found, i.e. the optimal policy is a constant a/s ratio equal to the ratio of the elasticities.

Advertising as an Investment

The advertising appropriation decision is made annually in most cases. In some companies there may be a five year plan of expenditure and additionally there may be procedures for reviewing advertising expenditure quarterly or in the light of major changes in the market or the economy.

Advertising expenditure may have long lasting effects, for example heavy advertising for a new product to establish a 'brand image' may be expected to help ward off competitive products in future years. It is difficult to describe the role of advertising here without using such terms as 'investment' and 'paying dividends later'.

In view of the appropriation setting process and the possible delayed effects of advertising, some writers have argued that advertising expenditures belong in the capital budget rather than being treated as a running cost. Indeed it can be further argued that the classical economists' view that firms pursue the single goal of short term profit maximisation is no longer valid: many writers and analysts (e.g. Baumol, Marris, Cyert and March), have emphasised the diverse nature of companies' and managers' goals. Often growth subject to some minimum profit constraint is the overall objective; in the case of a new product the objective might be capital payback and profit after a set number of years; in the case of a high volume, but declining product, the objective might be to maintain the high level of contribution to overheads, although the product in its own right might no longer be very profitable. In all these cases the advertising input may be partly aimed at achieving these long term goals and could therefore be considered an investment.

Dean (1966)1040, has argued that the advertising budget decision should be made relative to investment criteria. His basic propositions are:

- a) advertising is partly an investment;
- b) it differs from other investments;
- c) profitability is the basic criteria to be used in assessment;
- d) the main determinants of investment in advertising are the amount and timing of this added investment, the added earnings and the risks involved;

- e) discounted cash flows are the best means of analysis
- f) advertising should compete - on a dcf basis - with other potential investments relative to the cost of capital
- g) if advertising were put in the capital budget it would force more rational justification for advertising expenditures.

Dean's basic tenet is that advertising expenditures are justified if they cause enough increase in profits to warrant the outlay. Hence to apply his principles one must be able to measure the effects on sales and the effects of sales on profit.

Strictly all promotional expenditure could be considered as an investment and advertising is not a special case. In many circumstances promotional activity in total probably causes some short term response and also has a delayed response. Although it is appealing to develop decision rules assuming one or other form of response occurs, alone it can grossly oversimplify. Dean's analysis refers to circumstances where advertising is undertaken for long term purposes.

Capital goods and consumer durables are perhaps markets where advertising investment appraisal along the lines Dean suggests is appropriate. In such circumstances the first decision should be whether to advertise or not, rather than the amount of expenditure, and the investment appraisal analysis would be helpful. Investment appraisal on other factors probably influences the magnitude of advertising budgets more than appraisal of advertising itself: for example, investment analysis of a new product for which the plant is very expensive, will dictate that payback of capital must be quick and so marketing effort, including advertising, needs to be great from the outset. When existing plant is used to produce a new product, the urgency for payback of capital is minimal. This explains why some new products have very high advertising budgets, (e.g. freeze dried coffees) while others can be launched and marketed with minimum advertising effort (e.g. Vesta meals).

One person who has tried to deal with the investment issue is Peles (1970) 476, who has reported an empirical study designed to measure the annual rates of depreciation of the intangible asset created by advertising expenditures - goodwill.

"These rates may be used to determine which portion of the periodic expenditures for advertising should be deferred as an asset and which should be charged to advertising expense."

The advantages claimed for this approach are that :

- a) the resulting balance sheet and income statements give a more realistic picture of a firm's present financial condition and past performances,
- b) more meaningful calculations of the rates of return on assets can be determined,
- c) it may help explain the difference between a firm's book value and its market value.

Where advertising is a major activity and contributes greatly to the wealth of a company, for example direct-response, then there are clear advantages to trying to take into account the investment characteristics of advertising when deciding the budget.

Peles' limited econometric study for response to advertising for beer, cigarettes and cars in the U.S. found that :

"advertising expenditures of beer and cigarette firms should be depreciated by a declining balance method with an annual rate of 40-50 per cent for beer and 35-45 per cent for cigarettes. In the car industry, practically all the current expenditures for advertising should be considered in the year of incurrence."

Modifications to the basic theories

Various writers have tried to overcome some of the shortcomings of the basic theories of advertising budget setting developed by fellow economists.

Some of the major shortcomings which may indicate the general principles described earlier can be summarised as :

- a) no account is taken of the interaction between other market mix elements and advertising and sales levels
- b) no consideration is made for changing manufacturing costs with levels of output and sales
- c) it is generally assumed advertising can be varied at will and by small amounts
- d) it is generally assumed that the effects in sales or profit terms due to advertising can be determined
- e) competitive activity or reactions are ignored
- f) advertising content and media planning effects are ignored
- g) the delayed or cumulative effect of advertising is not always allowed for.

A typical attempt to accommodate some of the shortcomings is the approach presented by Verdorn (1956) (1955) which incorporates considerations of points a), b), c), and to some extent g). Verdorn's analysis is more realistic in some respects but unfortunately still requires that the decision maker can forecast the sales response to a variety of possible advertising budgets.

An alternative approach to improving the understanding of the adequacy of the economists' approach is to put their theories to the test. Several empirical studies have, in fact, done this and their findings are presented next.

Empiric Studies

A variety of studies have been conducted examining the effects of advertising on a company's performance in the market. Those commented upon in this section are those whose aim was to examine the validity of the marginalist principle or to highlight similarities and differences in advertising policy across different industries.

Else (1966) 1111, purported to explain the differences in a/s ratios for 33 U.K. consumer goods industries by differences in the cost of spreading information. He argued that the cost would be low, relative to sales, when total sales in a market were high because the cost can be spread over the large sales volume; when the number of competitors in a market is high, more information is required to be disseminated, he further argued. Unfortunately, his statistical analysis is incomplete in some respects and the whole approach would seem naive.

A study by Doyle (1968) 1199, has presented figures which show that there is greater advertising expenditure on non-durable products than durables. Two explanations are offered: a) the markets for many durables are specialised and media advertising will generally be too expensive and b) since the consumer will be contemplating a large commitment in expenditure he may want detailed information that is better provided by direct means, for example, salesmen, catalogues or friends. Consequently a/s ratios should be expected to be lower. Doyle's analyses of 84 consumer goods industries confirm these notions: differences in a/s ratios were shown to be partly attributable to price, sales levels and type of product (durable or non-durable).

A more recent examination of a/s ratios across different markets has been reported by Cowling (1972) 1695. This study was conducted on limited data on 5 product fields: cars, tractors, margarine, instant coffee and toothpaste. Advertising/sales ratios in each of these markets was examined against the "optimum" as determined by the Dorfman-Steiner principles. The results were that :

- a) there was - not surprisingly - a marked difference in a/s ratios between the durable and non-durable products;
- b) in the non-durable markets, the a/s ratios were very close to the 'optimum'.

The divergence from the 'optimum' for cars and tractors puzzled the author of this study but consideration of the studies cited earlier and a knowledge of the marketing of the goods, suggests ample explanations.. The theoretical 'optimum' a/s ratio for each product was calculated from advertising and sales elasticities derived by market share regression analyses on past data.

Another multi-industry study by Comanor and Wilson (1967) 1042, examined advertising levels and profits. For 41 consumer goods industries it was found that those deemed to have 'high' advertising also had profits half as high again as the rest; which was the cause and which the effect was not resolved unfortunately.

A further possible reason for the difference between a/s levels in different industries was explored by Nelson (1970), 1956. He suggested that in some goods the quality can be perceived before purchase whereas in others the product must be purchased to allow evaluation in use. He further suggested that this should lead to greater local store advertising for the former, 'search' goods compared to national advertising than for the 'experience' goods. Data is presented to confirm the contention.

Telser (1964) 1109 conducted a study to examine advertising expenditures and market share stability to explore whether the need for stability explained industry advertising levels (and therefore a/s ratios). He used data on toilet soaps, toiletries and packaged foods in the years 1948, 1953 and 1959. Over this period, the most stable brand shares were in foods which had the lowest advertising spending. He concluded that advertising did not stabilise brand shares and that innovation and rivalry were important influences on stability. It must be pointed out that market conditions may have changed by now.

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In a study entitled 'How much does it pay whom to advertise?', Telser (1961) 1108 , further examined the difference in amounts spent to advertise different product categories. He concluded that differences were not just random, partly because product by product advertising expenditure was very much the same in the U.K. as in the U.S.A.. He explored the product and market characteristics which might justify differing levels of advertising expenditure. On the basis of the mathematics of profit maximisation he predicted that heavily-advertised products would have lower elasticities of demand. After referring to examples of product categories conforming to this behaviour, he also noted certain exceptions and concluded that brands with high price elasticities would be heavy advertisers if:

- i) there are few firms in the market,
- ii) price elasticity is low for the product category as a whole,
- iii) the total market can be expanded by advertising.

He also concluded that heavy advertising tends to be required for commodities which have frequent product modifications or new product introductions, as well as for products that are subject to frequent fashion or style changes. There are of course, further reasons.

Although this study does not indicate precisely how much advertising is needed in different circumstances it explains some reasons why the amounts will vary with circumstances even within a broad product category. Marketing practitioners are well aware of these but it is useful to have their beliefs and understanding confirmed in economic parlance; the study could be of most value to other economists to help their understanding of the subject.

Consideration of unadvertised 'own-label' products has not been given much attention by economists. One might wonder whether the price of own-labels and the demand for them reflects the marginal value of advertising to brands.

Another study by Telser (1962) 1139, indicated the slow response of competitors to a change in advertising expenditure, or policy, in an oligopolist market (cigarettes). Telser attributed this to :

- a) the time lag between planning and execution
- b) the slowness of data on competitors to be appraised
- c) the common practice of retaining fixed a/s ratios.

This study is one of the few that directly allows the justification of the economist's assumption that competitive effects can be ignored, in the short run, in budget setting decisions.

Finally, Tsurumi (1973) 1594 has reported a comparison of two methods of optimising the advertising budget: one method is the Nerlove-Arrow type of 'goodwill' stock-adjustment-theory and the other was a sub-optimisation one where :

"the time horizon is broken into sub-intervals and then treated as a variable one may (then) use Bellman's technique (dynamic programming) to handle the problem."

Using data for Japanese pharmaceutical companies, he found that the 'goodwill' type model seemed to represent what actually was done in practice and that the alternative method of approach "runs into trouble easily from an analytical solution point of view".

Hence, those studies that have compared companies' apparent behaviour on advertising budgets against the main economists' theories, have found agreement in the main. Deviations from theory are usually readily explainable in terms of the particular market conditions or purposes of advertising.

CONCLUSIONS

The main thread running through the economists' approach to setting advertising budgets is that, generally, a policy of constant advertising-to-sales ratio is optimal, under both monopoly and oligopoly conditions. Even allowing consideration of carry-over effects of advertising within a budget period does not alter the policy.

It is important that those subscribing to this policy note that it is subject to assumptions about the market processes and perhaps, most importantly, does not allow for advertising effects extending beyond the budget period. Because of another major assumption concerning constant advertising and price elasticities, the policy is probably most defensible where sales volumes are relatively stable and other market mix variables are not used to upset this stability.

Maintaining a constant a/s ratio may be the ideal policy in some circumstances but setting the right ratio in the first place still has to be solved. Other than to indicate that the a/s ratio should equal the ratio of advertising to price elasticity, the economists' contribution is not helpful to this practical problem.

Management Scientists have tried to discover relationships between advertising inputs and market response, bearing in mind the market processes at work. In this respect they have tried to be practical and produce actionable results. Their contributions on this aspect and their other approaches to the problem are summarised in the next section.

However, one of the other major conclusions to be drawn from the economists' empiric field studies presented in this report so far is that if advertising budgets are usually a constant percentage of sales revenues, then it will always be impossible to determine statistically the effect of advertising on sales from annual data, except in some very special circumstances.

MANAGEMENT SCIENCE / MARKETING RESEARCH
CONTRIBUTIONS

Introduction

When required to contribute to the decision on an advertising expenditure level for a product, management scientists and marketing researchers have broadly developed two approaches. The first has been to derive models or equations representing the behavior of the product in the market and which purport to allow the evaluation of changes in advertising expenditure on sales or profits. The other main approach has been to systematise the management decision process so that the most logical outcome can be derived from available information. Both approaches aim to provide a mechanism for estimating advertising effectiveness in sales terms and isolating this from the contributions made by other market mix elements. Hence the presence and influence of these other factors is acknowledged and the overall marketing mechanism is examined in the more comprehensive examples of these methods. Those methods and examples which isolate advertising's effectiveness rely on analysis of past market data, in-market experiments or both.

The methodologies resulting from each of these broad approaches are at least testable in that they do not contain impractical notions. The real skill, perhaps, is in deciding which particular method is appropriate to test in particular circumstances and perfecting it, if possible, to provide more accurate information than would otherwise be available.

The MCRC has already undertaken several studies which have a bearing on methods that can be used to help in the advertising budget decision.

The various methods of describing aggregate behaviour in the market have been summarised in the MCRC Occasional Paper No. 4 "A Review of Approaches to Modelling the Effects of Advertising Expenditure on Consumer Behaviour". An examination of the results of applying these various approaches in practice was undertaken in the MCRC Report No. 2(ii): "The Post-Display Analysis of Promotional Effectiveness". From this it was concluded that it was possible to demonstrate the sales effectiveness of advertising efforts but, in general, sales effectiveness is difficult to establish and the conclusive cases involved specialised marketing circumstances.

As was highlighted in the conclusion of the previous section, if advertising budgets are set predominantly as a fixed percentage of sales it will be extremely difficult to isolate a causal effect between advertising expenditures and subsequent sales. Some authors go further and assert that no relationship can possibly be found, eg. Kernan and McNeal (1964) 1746,

"Advertising functions in an environment comprising many uncontrollable and incalculable factors that may influence results."

For such reasons it can be concluded that many results purporting to attribute annual fluctuations in markets to advertising expenditures will be fallacious. However, if shorter time periods are examined and/or regional variations explored there is greater scope for detecting some effect. Often in such exercises area tests or experiments are also conducted.

The use of experiments or area tests to determine ideal advertising levels has been assessed in MCRC Report No. 5 "An Appraisal of Media Weight Tests". It was concluded that there are many reasons why simple tests will not produce conclusive findings for determining advertising budgets. It was advocated that in order for this approach to be useful:

- a) detailed preparatory work must be undertaken to estimate the magnitude of expected effects;
- b) more accurate sales data than is usually collected may be required.

and c) the test should be part of an ongoing programme of research and analysis.

The special circumstances of direct response advertising and the consequences for budget setting procedures are covered on MCRC Occasional Paper No. 5 "Factors Affecting Direct Response Campaigns' Success". Similarly,

the way in which media scheduling methods can be employed to most effectively deploy an advertising budget has been extensively examined in MCRC Occasional Paper No. 2 "A Review of Media Scheduling Methods".

In this section we shall present and review those methods which have been proposed for detecting advertising effects and determining budgets for which there is some empiric validation or which would seem to be of value in certain specified circumstances. These circumstances are predominantly described by market characteristics.

Situations of Limited Competition

Vidale and Wolfe

The method developed by Vidale and Wolfe (1957) 680, was the result of several experimental studies. It is a simple model of aggregate sales behaviour over time, relative to varying levels of advertising and is claimed to be consistent with market observations.

The method requires that three quantities be ascertained: a sales decay constant, the saturation level and a sales response constant. The sales decay constant is the rate at which sales of the product decrease in the absence of advertising. The authors claimed to have observed several instances where unpromoted products declined at a constant rate per year; the rate varied across products but was constant for any one product. The saturation level is the limit for sales that can be expected to be achievable. Again from experimental evidence the authors asserted that when products were newly promoted sales rose rapidly and then levelled off suggesting that for a particular medium only a certain proportion of potential customers exposed to the medium will respond. It is assumed increased usage by current users is not expected.

The sales response constant (r) is defined as the additional sales generated per unit of advertising but bearing in mind the saturation level. Hence, if L is the saturation level, C is the current level of sales and R is the increase in sales per unit of advertising expenditure

achieved, over and above C, in a test campaign then $r = \frac{L}{(L-C)} \cdot R$.

Hence it is assumed that while the responsiveness of potential customers per unit of advertising expenditure is constant, the observed response in the market declines as more is spent because there are fewer and fewer potential customers still to be tapped.

One expression for the formula relating sales to advertising is:

$$S(t) = \frac{rAL}{rA + \lambda L} + S(o) - \left(\frac{rAL}{rA + \lambda L} \right) e^{-a}$$

where:

$S(t)$ = rate of sales at time t

r = sales response constant (defined above)

A = rate of advertising expenditure (eg. £x per month)

λ = sales decay constant (described above)

$S(o)$ = sales rate at the beginning of the advertising burst

L = saturation level for sales of the product

e = 2.78.

$a = \left(\frac{rA}{L} + \lambda \right) t$

Hence if everything in the formula is known the rate of sales at any time can be calculated by substituting the appropriate value of t , eg. for sales after 3 months $t = 3$, where all the other relevant parameters are expressed in rates by month.

The formula would predict that while advertising is continued sales will rise and then start to decline when advertising ceases. Another consequence of the formula is that for equal expenditures greater additional sales will be obtained by continuously advertising than by a concentrated burst.

The formula can be used to calculate the advertising expenditure rate necessary to maintain a constant level of sales or the level of

expenditure necessary to raise sales to a required level. The profit consequences of either of these policies can then be determined. Theoretically, the basic equation derived by Vidale and Wolfe can be used to derive the optimum advertising expenditure pattern; this would require integration, probably by numeric methods.

The Vidale and Wolfe approach would appear appropriate to circumstances where:

- a) increased advertising is not expected to cause increased purchasing among current users but to attract new users;
- b) if advertising ceases sales will decline and by a constant amount each month;
- c) there is a saturation level of sales;
- d) competitive effects do not normally affect the sales response to advertising;
- e) other market mix elements, such as distribution, are kept relatively constant or their effect on sales can be distinguished.

Although the 'carry-over' effect of advertising from one period to the next would be accounted for in the sales decay constant, the overall method would probably be most appropriate where it is felt that the effects of advertising in a period are dissipated primarily in that period. Although this is a restricted set of circumstances they may well be appropriate to a small market dominated by one major brand supplying a product of which people can only consume a limited amount - perhaps a semi-durable. The formula may well be appropriate also to the national launch stages of a new product into a fairly small, not very competitive market. In this case the necessary parameters for the formula would have been derived in test markets.

Simon

J.L. Simon (1971) 1007, has developed budget setting rules for direct response campaigns so as to apply to certain other types of markets.

The underlying principle is that of maximising profit:

"continue to increase the amount of advertising until the incremental value for an increase in advertising equals the cost of this extra advertising"

Simon maintains that this principle can be effected by a 'small' company where:

- a) its advertising will not provoke 'defensive' expenditures from others;
- b) its product is no different to that of other companies;
- c) its sales in a period compete with those of other companies rather than its own in the future (ie. increased sales this month will not 'borrow' from next month);
- d) sales due to advertising can be separated from those caused by other factors or these other factors are maintained at a fairly constant level and advertising is used as the sales stimulant.

For these circumstances Simon sets out seven steps to calculate the ideal advertising budget. His procedure in many ways applies to a minor brand in the sort of market to which the Vidale and Wolfe method is applicable. Therefore, Simon's method complements the coverage here of this sort of market.

The Simon method attempts to maximise net revenue from sales after production and marketing expenses. It is assumed that production costs increase in proportion to volume but although this is unlikely over a large range it is probably tenable over the range of outputs likely to be affected by advertising changes. Essentially the method calculates the expected sales ensuing from several possible expenditures and campaigns over a period of time and discounts the net revenue received from each back to the starting point. The plan with the highest discounted net revenue is, therefore, selected as the best. The method relies on a blend of pragmatism and simple accounting logic: it requires that possible expenditure levels be proposed by a company in the first place and then attempts to assess these in a systematic way to pick the best. The procedure is detailed in Appendix D under Simon's method (i). In Simon's book (op. cit.) an example of the method is shown applied to the well-known Lydia Pinkham product history (p. 106). The product is a rather individual, vegetable medicinal compound, is old established in a relatively small market and probably typifies the sort of product to which the method might be appropriate.

The previous methodology suggested by Simon is to find the advertising appropriation separately for each period of time. It assumes that sales in each period of time are independent of each other period. As indicated, this analysis may be appropriate for a product that has a relatively small share of a market: in this situation it is assumed advertising for the product in one time period does not compete with the product's own advertising in the next time period. If anything, it competes with the advertising of competitive products in a given time period, and all potential purchasers stimulated by advertising in a period are satisfied in that period. Simon suggests this is appropriate for such products as canned goods, confectionery, bicycles, household linen and wrist watches.

However, Simon recognises that where a product has considerable market power or is in a strong monopoly position, its advertising in one period may "borrow" from its sales that might otherwise have been accrued in a subsequent period. The existence of such a borrowing effect was claimed to be demonstrated in test market experiments for Teflon cookware by

Dupont as reported by Becknell and McIsaac (1963) 806 , The existence of borrowing effects means that period-by-period advertising appropriation decisions must take this mutual interdependence into account. Similarly, earlier period's advertising may enhance the current period's effect. On the assumption that:

a) the magnitude of advertising in a period affects only the number of new customers attracted by a subsequent period's advertising; and

b) the size of a subsequent period's advertising does not affect the retention rate of customers created by earlier advertising; then,

Simon claims it will not be difficult to make subjective estimates of probable sales results in each period due to a variety of possible advertising expenditures and then to choose the best sequential set over several periods. A systematic and comprehensive method of fulfilling the requirement is discussed under "Baysian Methods" (page 55)

In a similar analysis, Simon (1965) 1112 , asserted that if a product is already spending large amounts on advertising in each period and if the market is relatively stable, the management should disregard the fact that one period's advertising may borrow from the next. He suggests the company should aim to spend the same amount in each period "and rest assured that it is not far from the optimum (so long as copy effectiveness, competition and other relevant factors do not change)". In other words, he suggests that even established products in stable markets exercising considerable monopoly can use the underlying methodology outlined previously for setting its period-by-period advertising levels.

"In most monopoly cases, finding the best advertising budget on a period-by-period basis will be quite satisfactory. A firm has a natural desire to earn profits while it can and to pay less attention to the uncertain future. This attitude is well justified by the invariable changes in the environment - shifts up or down in the total size of the market, more or

less close competition, and a dozen other variables that probably would swamp the nice adjustments a multi-period analysis would recommend. This is an added reason why the soundest plan is to push to the margin in each period, independent of other periods."

This view, however, is only appropriate where advertising decisions are taken in isolation from the rest of the business. As Forrester (1959) 864, has argued in his *Industrial Dynamics*, a more 'total' view should be taken of the effect of a change in one part of the business on other parts. An increase in advertising in a period may appear valuable for its expected sales stimulus but if this causes supply or production difficulties the initial advantage may be negated. Marketing orientated companies have well coordinated plans covering all aspects of the selling chain which do not allow major fluctuations to be introduced at one end of the system. For example, in one large U.K. company the production management require 6 months' notice of any major promotional activity. Hence, any period-by-period advertising decision making for products in large markets could just be of the 'fine-tuneing' nature.

Sasieni (1971) 882, has examined the theoretical desirability of making period-by-period advertising expenditure decisions:

"Since many people believe that there are circumstances in which a cyclic, or pulsing strategy can be optimal it should be possible to discover a class of response functions whose parameters can be specialised to yield a cyclic policy"

The sort of marketing situation he examined was that discussed in this section where competitive activities are essentially ignored. He concluded that period-by-period advertising decisions leading to a 'pulsing' policy is not the mathematical optimum but maybe the nearest practical achievement of an optimum in certain circumstances. For this policy to be appropriate the marginal cost of obtaining a given rate of change in sales must decrease during a particular time interval: optimisation

of funds is achieved by advertising during this period only. He concluded that the sort of markets where this 'pulsing' policy may be appropriate are those where gross profit margin and market size are low.

Some confirmation of the validity of this approach for small markets only is given by Rao (1967) 1001, who cites in-market experiments where advertising was increased by up to 300% in some areas and decreased by 75% in others.

Carry-over effects

Nearly all of the exercises to quantify the dynamic aspects of advertising expenditures have been conducted for what are assumed to be simple marketing situations ie. competitive effects are ignored.

Two types of carry-over effects need to be distinguished:

- a) delayed response effects: there is a delay between the time advertising expenditure occurs and the time resultant purchases occur.
- b) customer retention effects: sales generated from new customers gained by advertising in one period may continue for many periods after the advertising has ceased.

For budgetting purposes, knowledge of the delayed effects of advertising are all important. In the Lydia Pinkham analysis by Palda he claimed to demonstrate that the short term sales per dollar of advertising was \$0.5 ie. for an advertising expenditure of \$1. in a period sales of \$0.5 were generated in that same period. However, the longer term sales generated by advertising was \$1.63 per advertising dollar. Hence, in the long term the company appeared to gain from advertising but not in the short term. Further examples of studies demonstrating the existence of delayed effects are those of Vidale and Wolfe (op. cit.), Kuehn (1962) 1125, Jastram (1955) 1744, and Tull (1965) 325. Each example is specific to a particular product and no generalisation can be stated. The establishment of precise carry-over effects from past data is not always

straightforward since statistical problems of multicollinearity invariably occur. A comprehensive summary of methods of estimating carry-over effects is given in Kotler (1971) 1749 (pages 120-134), and ways of accomodating multicollinearity problems are explained in Johnson (1963) 1958 .

Montgomery and Silk (1972) 883 , have reported the results of a study of the market response to a communications mix, in a pharmaceutical market very similar to that for which Amstutz built his simulation model (see page 50). A model was derived and applied to time series data for an ethical drug product's sales to estimate the short-run, intermediate and long-run effects on market share for expenditures made for journal advertising, direct mail advertising and samples and literature. Important differences were found and these communications variables in respect of the magnitude of their effect and their pattern of effect over time. Their analysis indicated that for the product they examined, expenditures on the various promotional means had, in the past, been allocated in inverse proportion to their effectiveness ie. the least effective method had received most expenditure. The market they examined is such that 'purchase' by an individual (a doctor) can be monitored via prescriptions as can their receipt of promotional material. Interestingly, it was found that the direct mail and samples-and-literature had a delayed effect which peaked in a period later than that in which they were issued; the effects of both had disappeared by 4 or 5 periods later. In contrast, journal advertising in this market demonstrated a high initial effect, followed by a long trail-off extending over at least 6 periods.

Brand Share Models

Introduction

In competitive markets one of the key influences on a particular product's sales is the proportion of all buyers in the market who buy that product. A company intent on increasing or maintaining its sales needs to comprehend how potential customers see their product in relation to competing products and what influences their predisposition and preference for the various competitors. Some of the potential influences are under the control of the producer, for example, quality and promotion, with price and distribution partially controllable; these factors provide a producer with the opportunity to try to influence his potential customers and ultimately sales. This desire leads to a need to understand buyer behaviour and the requirement to represent this quantitatively to assist in evaluating marketing plans and predict sales. Since advertising is readily controlled and varied in a market there have been many attempts to relate changes in advertising inputs to product sales shares with a view to pronouncing on the effect of different levels of advertising expenditure.

In oligopolistic markets where advertising is one of the chief competitive weapons it would seem reasonable and necessary to examine competitive advertising expenditures against changes in shares of markets held by the various competitors. Marketing and advertising practitioners assert that the way advertising 'works' in these markets is by 'reinforcing', 'reminding', 'reassuring' vis-a-vis competitive claims and advertising presence; for example, Joyce (1968) 739.

Hence, a simple, isolationist model such as that of Vidale and Wolfe is inappropriate for products in large, advertising-competitive markets. Because the enhancement or maintenance of a product's share of market is the goal in such market circumstances, as evidenced by many writers (eg. Reeves 1961), advertising-brand share models are particularly appropriate. The value of various such models will be examined in this section.

Weinberg

A method of using elementary mathematics in the advertising appropriation decision for frequently purchased has been described by Weinberg (1960) 1794. The method has been included in two books produced by the ANA on how to decide advertising budgets, one in 1960 , and McNiven (1969) 557 , and is obviously felt to be of practical value. Briefly, the method uses past advertising and sales data for a product and its competitors to compute an 'optimum' advertising budget:

- i) for each of a series of recent years the product's share of advertising expenditure in the market is calculated;
- ii) for the same years calculate market shares in sales terms (by value);
- iii) divide advertising share by market share to obtain "the advertising exchange rate";
- iv) graph the logarithm of this rate for each year against the change in market share,

and use the resulting line to predict the effect of various levels of advertising expenditure. The paper by Weinberg very explicitly describes how to undertake the necessary procedures and gives worked examples. It is a useful example of this type of 'past data' approach since it emphasises the need for marketing objectives to be set at the outset of the exercise and describes an advertising planning procedure into which the budget is fed.

Although it is rather a crude method McNiven (op. cit.) believes that it:

"is likely to produce better estimates of advertising levels than the 'guide-line' methods . . . the estimates derived . . .

will probably place the advertiser in the region of optimal expenditure, although perhaps not at the optimal level."

Weinberg's method has limitations, chief among which are its reliance on past data of sales and advertising and its insensitivity to particular significant additional influences on a specific market. Those with long memories will also detect the similarity with the 'Dynamic Difference' model of sales and advertising shares. Weinberg's formulation, including as it does log values of advertising shares, is somewhat more sophisticated and accommodates the notion of 'diminishing returns'.

Hence, as suggested by McNiven, Weinberg's method could be used to obtain order-of-magnitude estimates for required advertising expenditures for an established product in a market where advertising is the chief competitive weapon. The example quoted by Weinberg in his paper is a product with a 20% share of a major market in which advertising expenditure in 1953 was over \$14m. The product is not named but he was working for IBM at the time which might indicate the type of market for which the method was derived.

The apparently successful use of similar methods has been reported by several authors, for example Schultz (1972) 912, demonstrated its value in a market consisting of two airlines serving a particular inter-city route.

Hendry

In the last two or three years considerable interest has centred on claims made for a new method of determining advertising budgets. The method is marketed in the U.S. by the Hendry Corporation. No explicit description of the formula, model or equation used in the method for setting advertising budgets has been published so it is impossible to evaluate. An interesting descriptive explanation of the background

to its derivation and use in practice is given in Media Decisions (1972) 1959 , in which it is claimed:

"several large companies (General Foods, Coco-Cola, Lever and Gillette) have tried it out - and say it works."

Similarly, a paper by its inventors Butler, Thompson and Cook (1969) 1960, claims:

"A quantitative method of advertising expenditure analysis known as Hendro Graphics, determines for individual brands of consumer goods the relationship between varying levels of advertising expenditures and the resulting share of market and contribution to profits. Since its development in 1962 it has been successfully utilized by large advertisers in over 60 different consumer product classes in several thousand cases with outstanding overlay with the real world."

It is claims such as this and the apparent corroboration of large companies' use which cause current interest.

In order to use the method all that is apparently required, according to Butler et al., is data on three items of a brand's performance:

- a) the direct manufacturing margin (presumably sales less variable costs);
- b) the advertising expenditure;
- c) the share of market.

Graphs are then produced relating advertising expenditure at different levels to market share and subsequent profit. It seems, however, an unnecessary complication to predict profits when advising on advertising budget setting since marketing people can obtain profit estimates if they are given sales estimates. The overall method seems disarmingly simple to apply although Butler has stated (1972)1959 , that the mathematics in

the derivation of the formula are very complex and he doubts whether many people could understand it. The advertising expenditure formula is said to be based on a theory of consumer behaviour in brand switching derived by Butler. Information has been published on this, Butler and Butler (1971) 1961, and has been the subject of considerable scrutiny. It is immediately apparent from this that any advertising budgetting formula derived from the brand switching theory will only be appropriate where advertising is intended to influence market share in the short term. In other words, if the Hendry formula is of value it is relevant to products in large, competitive markets where advertising is used as a means of gaining or maintaining market share in the short term (ie. over an average purchase interval).

Butler and Butler's description (op. cit.) of the derivation of their brand switching model is extremely, and unnecessarily, obscure and probably contains typographical errors such that a critique by Ehrenberg (1974) 1962, includes the quote by Goodhardt:

"what at first seemed nonsense, on closer examination turned out merely to be wrong."

A systematic appraisal of the Hendry brand switching model and comparison with other models is given in Ehrenberg and Goodhardt (1974) 1963, who suggest it is less satisfactory than other models. This paper also gives references to extant literature on the Hendry methods as best they are known.

Essentially, it seems, the Hendry approach to advertising budget determination is to assume the share of a market held by a product is made up of two parts - that due to advertising and that due to other market mix factors (price, quality, packaging, distribution and the like). This is expressed, according to Cantner and Kershaw (1971) 1964, as

$$S = S(o) + \frac{A}{A + Tc} \cdot h$$

where:

S = total product sales

S(o) = sales due to non advertising factors

A = product advertising

Tc = all other advertising in the market, weighted
for 'effectiveness'

h = the probability of brand switching (by the average
consumer), termed 'entropy' by Hendry

Entropy is a concept borrowed from physics and since physicists find difficulty interpreting its physical meaning it serves no purpose in marketing applications, other than to confuse. The terms Tc and h are not well explained by Hendry, but we can guess how they are operationally derived from past data and then iteratively modified for evaluating the effects of changes in advertising share. Basically it can be deduced that the underlying theory of how advertising works is that if a person who is susceptible to changing brands sees an advertisement for the brand in question they may purchase it next; or,

probability that a	probability person sees	probability person
person buys brand X	= advertising for X	x switches brands
due to advertising		influenced by
		advertising

This concept is not new, although the Hendry mechanism or mathematics of operationalising it may be novel. It can be seen, though, that if a product's marketing management are trying to use advertising to influence potential switchers - assuming they have defined and quantified these - then the Hendry method may be of value. Of course, there have been many attempts to demonstrate the existence of such a mechanism (eg. McDonald (1970) 145) with little success. It could be concluded that in many markets advertising does not work in this way, although it may in some. The Hendry formulation would appear to deny the existence of complementary effects between advertising and the other marketing inputs. Taken to the extreme of no advertising it would also imply a constant level of sales

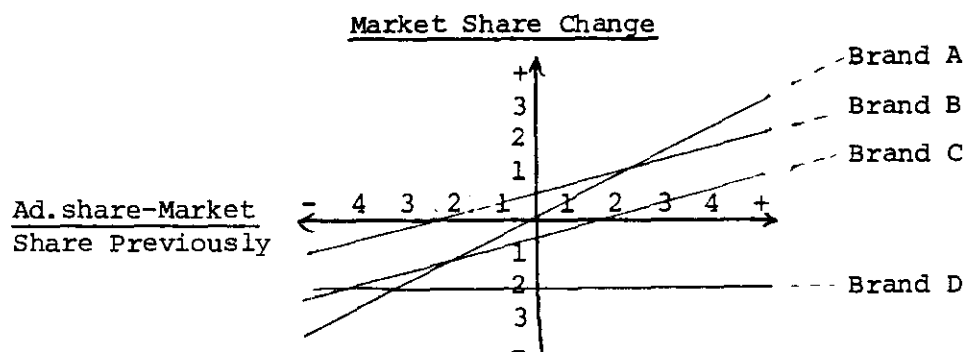
which for branded goods, to which the formula is primarily addressed, would seem a most unlikely outcome.

Consequently, until either detailed case history material is made available on the use of the Hendry method or its precise formulation is revealed it is not possible to pronounce on its value. It seems likely, though, that its use would be restricted to well established brands competing for market share in the short term through advertising in a well defined market.

MAP

Another use of past advertising share and brand share data for determining advertising strategy has been illustrated recently. The method is reported and explained with an illustrative example by Adams (1973) 1598.* The value of the procedure is not so much in determining what to spend on advertising but to indicate whether marketing effort should be directed towards improving 'product' strengths or 'advertising' strengths. If the latter seems to be the case for a product the procedure would indicate whether improvements in advertising 'content or 'weight' is required.

The only data required is the change in annual brand share from year to year, over at least a five-year period, together with differences between advertising and previous marketing share.[†] Data for all brands in a market are then plotted on a graph for a comparison of relative strengths and weaknesses and to allow diagnosis for any particular brand. Diagram 1 illustrates an example of such a graph.



* and also Peckham (1974) 1965. [†]i.e. Ad.share(t) - Mkt.share (t-1).

It is felt that the slope of the line indicates the effectiveness of the advertising (in gaining market share), while the intercept on the vertical axis indicates the quality of the product and/or its positioning. For example, increasing advertising share for Brand A has proved particularly worthwhile but has done nothing for Brand D; Brand D also has a 'negative' product quality and position situation, all of which would indicate more than just advertising expenditure would be needed to enhance its brand share. Brand B has 'positive' brand attributes and has responded to advertising share increases, therefore, Adams would maintain that enhancement of advertising share is the required marketing policy. Brand C has responded to advertising share increases but has 'negative' attributes which if the situation were improved would tend to move its graph line upwards (ie. enhance its overall position in the market) and this may be a cheaper marketing ploy than increasing advertising.

The MAP analysis is not claimed to be for determining precise advertising budgets but for appraising competing brands' relative positions vis-à-vis product and advertising strengths. Such an appraisal, it is felt, will help judge the adequacy of current advertising expenditures and future strategies. Although the graph is not intended for precise predicted purposes Adams cites that:

"Using back data from Nielsen (in the U.S.A.) we tried 43 separate analyses and produced correct prediction of share change (to within 5% of actual) in 70% of cases. This is not a sensational result but we consider it high enough to justify the analyses and to discuss alternate strategies which can be derived."

As has been pointed out by Adams (1974) 1966 , the concept underlying the MAP analysis is very similar to that of Hendry (page 35) in that it is assumed brand share changes can be broken out into that part due to advertising and that part due to other factors. There would appear to be no theoretical reason for not extending the MAP analysis to shorter periods than annual changes but the accuracy of changes in

shares would be less precise and detectable trends are less likely to emerge over short periods.

The MAP analysis may be useful for objectively appraising advertising strategy, including expenditure, for established products which have predominantly competed over the years through advertising. Markets where below-the-line activities or significant product changes are believed to have affected market shares would not be suitable for appraisal. In summary the MAP analysis would be suitable for products where:

- it is not a new product
- the 'market' or the competitive products are not difficult to define completely
- other promotional activities in the market have been fairly static
- significant product improvements have not been frequently made by competitors
- consumers do perceive product differences (ie. not a neo-commodity)

When attempting to construct the MAP analysis graph to obtain straight lines it may well be worth plotting the log of advertising share changes, in accordance with Weinberg's analysis.

Kuehn

Of mainly historical interest, mention is made here of Kuehn's brand share analysis method which was claimed to be useful for budgetting advertising. Kuehn (1961) 1967, felt that sales of a brand were attributable to three main sources of influence: sales due to habit; sales due to product attributes; sales due to advertising interacting with the product attributes.

Initially Kuehn tried to demonstrate that changes in brand shares in a market could be explained, and predicted, by using a particular statistical model called Markov chains. Ehrenberg (1965)1539 , among others has shown that this model is subject to considerable problems both theoretically and operationally. Kuehn tested his initial model on brand share change data in the frozen orange juice market in part of the U.S. His model needed only knowledge of the most recent brand purchased by an individual in order to predict that person's next purchase. Empirically this was found not to be true in that the previous sequence of purchases seemed to have an influence. Kuehn then incorporated into his basic Markov model "learning functions" which would moderate brand switching behaviour in the light of a sequence of past purchase behaviour.

Using this refined model Kuehn examined the advertising expenditure strategy for a brand in a two brand market. One of the general findings from his example is that if one brand spends more than is optimal, in terms of return on investment, it will do more harm, financially, to the competitor than to the brand itself. The mathematics of Kuehn's advertising decision rules are moderately difficult and no reports have appeared of their being successfully applied to other markets.

Bass et al. (1961) 1951 , show that under certain assumptions Kuehn's formula for return on advertising investment, for situations of short term (instantaneous) response to advertising, reduces to that of the Vidale and Wolfe (op. cit.) model. The latter is certainly simpler to use, although essentially applicable to markets where competition is not expected to react quickly. The Kuehn approach is interesting theoretically and would be a useful introduction to considerations of marketing processes for anyone entering management science in marketing.

New Product Models

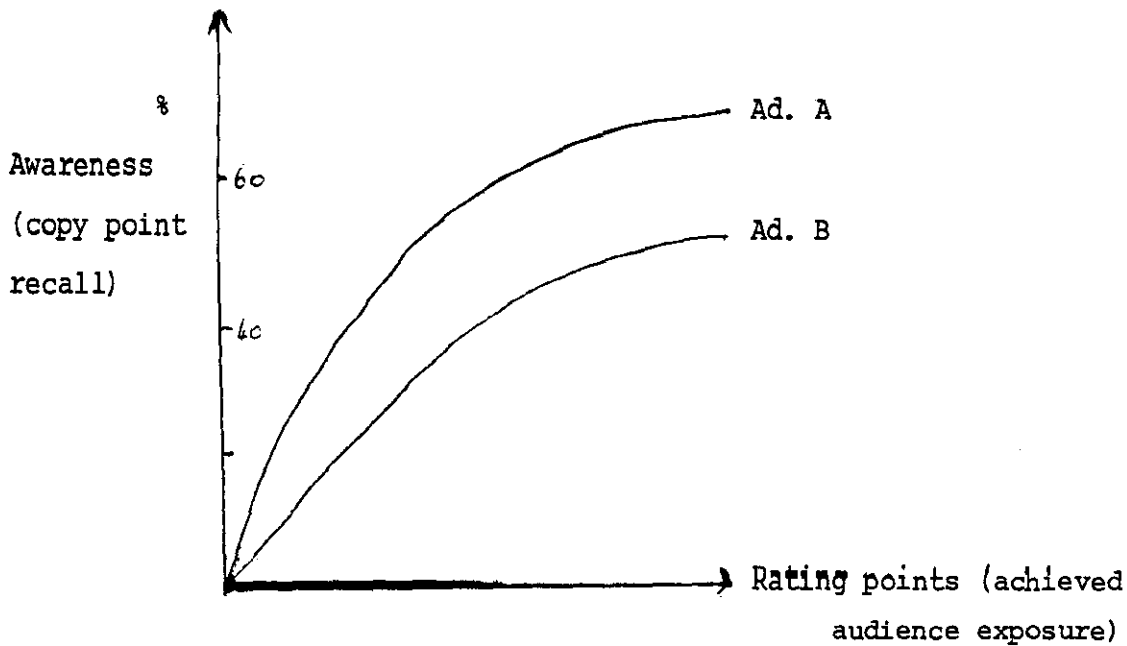
For the introduction of a new product into a market advertising can usually be seen to have well defined objectives. Various systematic procedures have been developed for determining advertising expenditures to achieve the initial goals. Many of these procedures have been shown to be adequate in straightforward circumstances. It would seem that in the introductory stage of many new products competitive effects are minimal and so a simplified view of market mechanisms is adequate and can be used for planning purposes for advertising. The underlying mechanism in all the new product advertising expenditure models is broadly:

advertising → awareness → trial [→ repeat]

Sound advertising planning considers more than just the launch period and what is crucially important is what happens in sales terms after the launch. The new product launch models do at least, however, aid in making decisions for achieving the launch objectives.

Awareness

Various formulas do exist for relating expenditure on advertising to achieved awareness of advertising content or copy point recall. However these can be only the briefest of guides as there are so many potential influences such as medium chosen and frequency of exposure. More than just copy point recall may be required as a response to advertising so that awareness alone is often insufficient. The influence of creative content on awareness has been illustrated by Adams (1971) 769 . He cites the growth in awareness for two campaigns for the same product in different years using different creative treatments; it was felt there was no carry-over from one year to the other. This is illustrated in the diagram below for the two campaigns featuring advertisement B one year and A the next.



DEMON/NEWS

A systematic procedure for initially planning the advertising input to the launch of a new product is that described by Charnes et al (1968) 620 , and Learner(1965) 1968 ; the latter is a non-technical description. A later modified version of this procedure has been described by Waschler (1970) 1969 , in which actual examples of its successful use in practice are cited.

The system is founded on the assumption that the form of the relationships between each of the links in the chain, below, are known and constant. These overall forms having been found from examination of the records of many new product launches (200).

$$\text{T.V. Ratings (R)} = b_1 \cdot (\text{Expenditure})^{1+K}$$

$$\text{Coverage (C)} = a_2 + b_2 \cdot \log_n (R)$$

$$\text{Awareness (A)} = b_3 \cdot \exp. (-C^{-a_3})$$

$$\text{Trial (T)} = a_4 + b_4 \cdot (A)$$

$$\text{Usage (U)} = a_5 + b_5 \cdot (T)$$

For planning purposes, management decide target levels for trial and usage and see what levels of awareness, coverage and expenditure appear to be necessary to achieve them (all represented as percentages of the target population). The values of the coefficients b_1 , a_2 , etc. are derived from data on previous launches, for the planning use of the system. For operational use, a new product launch would be monitored in its early stages through field surveys of awareness, trial and usage and from media research, ratings and coverage would be obtained. The precise values for the coefficients could then be calculated particular to the product. Predictions can be then made about the outcome of the initial launch. If greater awareness is required to generate more trial then this can be achieved by more expenditure or an improved creative treatment: it is believed coefficient a_3 represents 'creative quality' and can be compared with 'norms'. The later version, NEWS, is more comprehensive and includes a mechanism for trial being modified by distribution (availability) and promotions. The system can also be used diagnostically to help assess why targets may not have been achieved by comparing actual survey results on the various steps (awareness, trial, etc.) with those set to achieve the overall result of usage.

The system is somewhat simplistic but illustrates well the need to have some system of setting advertising goals and being able to relate this to expenditure. Given that other parts of the marketing mix, such as product quality, packaging and selling-in, are meeting their targets then such a system would be helpful for monitoring and planning advertising's role and expenditure.

More accurate methods of predicting coverage and frequency from ratings (and expenditure) have been advanced recently and could be incorporated into such a planning system as described above, see, for example, Hulks (1974) 1970, and Barnett and Lougher (1971) 72.

Lipstein

Another model which has been developed to help plan and diagnose strategies for new product introductions has been presented by Lipstein (1970) 1971. His model is founded on an analysis of brand switching during a new product introduction:

"In the very early stages of a test market or birth, one can immediately evaluate the impact of the new product introduction. If it fails to upset the structure dramatically, it is unlikely to achieve a meaningful share."

Lipstein's analysis is concerned with establishing an index of 'stability' in the market before the new product introduction as a means of monitoring the subsequent effects. The new product's maturity, and eventual sales, can be assessed, he asserts, when the market returns to stability again.

The implications for product advertising are demonstrated by application of the model to an actual brand launch. Lipstein cites that often in new product launches sales or brand shares rise rapidly, peak over a period of two or three months and then decline to a lower level. On less frequent occasions the product's sales and brand share grow steadily to attain steady level. He asserts that in the former case heavy advertising encourages trial by consumers before they have exhausted their existing supplies of the product category; they do not return to the market again until they have exhausted all supplies. If there is no advertising for the new product at this later time they may not buy it then. In the second situation, Lipstein believes, lower but longer initial advertising weight encourages a more steady trial, without the bunching effect, such that new triers come into the market when they need the product category. A further implication for advertising planning, stated by Lipstein is that:

"in planning an ad. campaign to combat a new product, a frequent strategem is to (delay action) from four to

six months or until a new product has passed its sales peak, and its share presumably has become vulnerable . . . but (consumers) will still be using up stock on hand during and just past the peak . . . and the market is in a state of disturbance. The counter effort should follow this period. The precise timing requires (a method of systematically analysing the market)"

Ayer

This new product launch planning model was produced and used commercially in the U.S. by the N.W. Ayer Advertising Agency and has been described in a case study (1964) 1972. The model uses a combination of informed judgements and empirical data to predict two measures of the performance of a new brand after it has been in a market for a specified length of time. The measures are i) the percentage of households, who are potential buyers of the product, who are able to recall the advertising claims of the new brand, and ii) the percentage of potential buyers who have bought the brand one or more times during the introductory period. Separate equations are used to estimate these two quantities eg.

$$i) \text{ Awareness, } A = a(PU) + b(CP) + c(RF) - K$$

where, PU = product uniqueness

CP = effectiveness of consumer promotion (advertising)

$$RF = \log \sum AHI \cdot CE$$

= effective coverage and frequency of advertising

$\sum AHI$ = total number of adjusted household impressions

CE = factor for adjusting for relative effectiveness of media type used

a, b, c and K are constants derived from an analysis of 40 new product launches. Values for such things as product uniqueness are derived

subjectively from a weighting system taking into account product benefits, concept, form and package uniqueness. It is said to have an average value of 36 and standard deviation (over 40 products) of 13.1.

Other such values are $\overline{CP} = 20.5, \sigma = 35.7; \overline{RF} = 3.826, \sigma = 0.384$.

$$\text{ii) Trial} = d(CT) + e(A) - J \\ + f(DN) + g(F)$$

where: CT = ability of promotion to induce trial

$$DN = D \times N$$

D = percentage of all commodity distribution
that will be achieved in the period weighted
by shelf facing and display achievement

N = an impact factor for graphics and shape and
subsequent usefulness of the package.

F = 0 if the product is revolutionary and
1 if it is just a copy of others already
available and appropriate value in between
if it has some novelty

d, e, f, g and J are constants derived from previous examples;

$$\overline{CT} = 41.3, \sigma = 40.8; \overline{D} = 56.7, \sigma = 13.4; \overline{N} = 54.1, \sigma = 12.2.$$

As can be seen this particular system is dependent both on judgement and the use of norms to gauge what values to set for the various parameters. Advertising expenditure estimates are necessary to calculate AHI. Theoretically, one could use the system to work backwards from the required value of AHI to calculate what expenditure was necessary to generate required levels of awareness and trial. The full Ayer model does allow the calculation of repeat purchases and profitability.

The main value of such a planning system as this is that it focuses attention on many of the considerations necessary in the success of a new product. The need to estimate parameters similarly forces comparisons to be made with norms and allows targets to be set. Strictly the norms used should be derived from data on similar products to that being planned. The system is not comprehensive and is geared towards the introduction of frequently purchased goods. It does not seem to have an allowance for the forgetting of advertising.

Simulation Models

Some marketing researchers have, in recent years, approached the problem of determining the effect of individual marketing elements, such as advertising, by formulating descriptive models of all the influences thought to bear on consumer behaviour at an individual level. A system representing an individual's pattern of behaviour as regards shopping is built up and the performance of the individual explored when changes are introduced into the system. By aggregating the behaviour of many such individuals the total effect in a market is hoped to be reproduced.

Amstutz (1967) 1021 , designed a computer program capable of reproducing:

- a) a consumer population of specified size
- b) developing and assigning product and brand awareness/
attitudes to each individual in the population
- c) subjecting these consumers to a set of experiences
(eg. exposure to advertising, product purchase, etc.)
- d) updating the consumer's attributes as a result of
these experiences

The amount of detail built into this system appears to be quite phenomenal including all the usual demographics for each person plus allowance for word-of-mouth contacts, shop assistant advice and such like. Data to parameterize the model is derived from detailed consumer panels and diaries. Such an exercise as Amstutz advocates is vastly expensive in both time and money and merely to derive advertising budgets one would suspect a simpler exercise or modelling approach would suffice. Amstutz' model is claimed to have been used by a U.S. pharmaceutical company to direct its total marketing operations.

Montgomery and Silk (1972) 883 , as described on page 32, have examined a similar market to that which Amstutz applied his simulation. Their

analysis was very much simpler and would appear to be as effective, although it was admittedly only concerned with the promotional effect in a fairly straightforward market situation.

For completeness two other examples of the use of micro-simulations in the U.K. should be mentioned. Lavington (1970) 886, constructed a system for examining purchase behaviour and response by consumers to the main marketing influences, including advertising. Similarly, Bryant (1974) 1973, has examined retailers' response to such influences. Both exercises are interesting academically and both claim to have been used in practice. However, both authors admit that not all the data they required was available. As a means of determining advertising budgets such exercises would not be warranted, except perhaps where advertising was the predominant force, but a simpler analysis would probably suffice.

Using Consumer Expectational Data

The allocation of promotional expenditures to products or markets is subject to the state of the market. If great expansion is foreseen then it may be judged important that advertising be expanded to capitalise on the potential. Similarly, if a contraction in consumer expenditure in the market is forecast it may be wise to invest less heavily in promotional activities, the expense of which may not be recouped.

The consumer durables markets are particularly subject to growth and recession as the state of the economy and credit restrictions fluctuate. The advertising expenditure decision on products in such markets must necessarily take forecasts of consumer expenditures into account.

It has been found by Heald (1970) 1974 , that a useful forecast of the state of the economy and expenditure on durables is made by consumers themselves. Consumer expectations surveys are periodically undertaken and it has been shown that there is a strong agreement between consumers' expectations and subsequent sales up to six or nine months later. The chief advantage of expectational data over traditional economic variables, such as disposable income, is the added contribution from factors underlying the decision processes in household behaviour. Anticipatory data should be able to register in advance changes within a household not always reflected in income statistics or behaviour until many months later. Changes in job situation and anticipated price changes will influence the likelihood of purchasing, particularly where the purchase is discretionary, like a new car or record player.

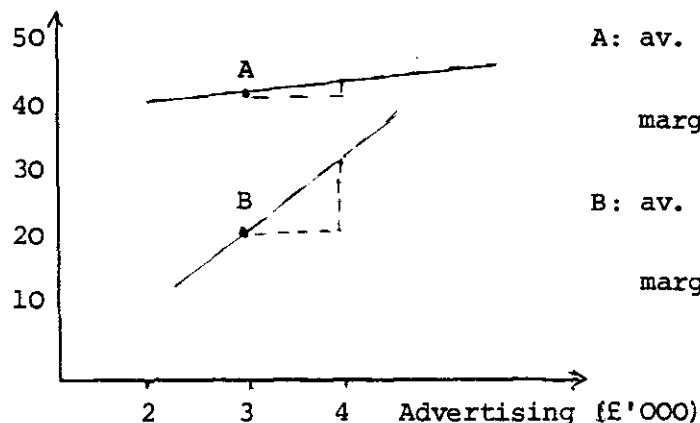
Similar surveys are conducted by the C.B.I., and reported in the business press, on manufacturing industries expectations on their prospects. No studies have been reported linking this data to subsequent trends but for advertisers in industrial markets it would seem a valuable source of extra information and worth researching further.

Another application of consumer expectational data to help allocate promotional efforts is reported by Murray (1969) 559 . He used consumer expectation survey data to segment a market regionally to show which areas held the greatest potential for future sales of consumer durables. Promotional efforts were then allocated on the basis of this analysis.

The general problem of allocating advertising budgets regionally is not strictly within the scope of this report but will be touched upon briefly here. In the section on Practitioners' methods for deciding advertising budgets it is suggested that one method is to sum regional expenditure requirements. However, the usual practice is to decide a national figure and then divide this among the regions. One of two opposed, alternatives is normally chosen as the criterion for dividing an advertising budget: in proportion to current, or anticipated sales; in inverse proportion to sales ie. giving greatest support to the weakest areas. There is some logic to both but neither is "right". The underlying principle is that support should be given in proportion to the return it will give. In a cogent analysis of this overall problem Kotler (1971) 1749, points out (p. 147-161) that promotional money should be allocated in proportion to the expected marginal return not the average return. This is best illustrated in the diagram below. Area A has a higher level of sales but is near saturation, therefore, it has a higher average sales/advertising ratio but lower marginal return. Area B illustrates the opposite situation.

Sales

(£'000)



$$A: \text{av. response} = \frac{42}{3}$$

$$\text{marginal " } = \frac{2}{1}$$

$$B: \text{av. response} = \frac{22}{3}$$

$$\text{marginal " } = \frac{10}{1}$$

A fixed advertising budget for the two areas would be optimally spent when a) the budget was exhausted and b) the marginal sales response was the same in both cases. Geometrically this means that the slope of tangents to the sales response curves would be the same for each area. In order to use this decision rule management would have to estimate sales response curves for different advertising expenditures, either from past experience and/or media weight tests. Kotler gives a worked example of the principles put to practice numerically.

Conclusions

In essence one is suggesting that advertising expenditure decisions for durable products are going to be particularly dependent on expected total market volumes and that a consumer based method of forecasting this may be particularly helpful.

Systematic Use of Subjective Data

Decision Theory/Bayesian Methods

The purpose of an advertising expenditure can be seen to help ensure that the overall marketing plan is successful. In other words, advertising is conducted in order to reduce the risk of failure to reach marketing goals or targets. If this view is adopted as to the role of advertising, the budget for any advertising must be considered in the context of the risks involved in not achieving the targets and the financial losses involved if the risks occur. This overall framework for the advertising budget decision allows it to be analysed by decision theory means. Essentially this uses managerial judgements and estimates in a systematic and most useful way to arrive at a solution to a problem.

There have been few explicit applications of decision theory to that of deciding advertising budgets, although the principles are well known. Introductory articles to the promise of this approach for advertising budget decisions are given by Green (1962) 954 , Enis (1972)1975 , and Montgomery and Urban (1969)1008 , but none reported an application to an actual problem.

In order to illustrate the method a hypothetical example will be used here.

The first step in the approach is to identify the risks (or opportunities) and their financial consequences and the chance that they will occur on the basis of the current best judgement of those concerned. Given the competitive nature of many markets and the fact that much decision making is based on experience, the decision theory approach would seem particularly appropriate.

Example: A company is planning to promote two existing products (A & B) in a market and wishes to estimate how much it should support one or

other or both through advertising.

Suppose, for simplicity, only three possible market shares are envisaged for each product and that they are independent of each other, and that the 'pay-off' in profit terms are calculated to be as shown in the table below:

Market Share (%)	Product A	Product B
	pay-off (£'000)	pay-off (£'000)
10	-75	-30
20	200	180
30	200	330

The likelihood that each product achieves the suggested market share values are next assessed bearing in mind all the influences, and are shown below:

Market Share (%)	A	B
	(chance)	(chance)
10	0.3	0.2
20	0.4	0.5
30	0.3	0.3

From this data it is possible to calculate the maximum sum it is worth paying to ensure that an unfavourable outcome does not occur for the company, ie. the expected value of support. This is calculated as set out below for the product A:

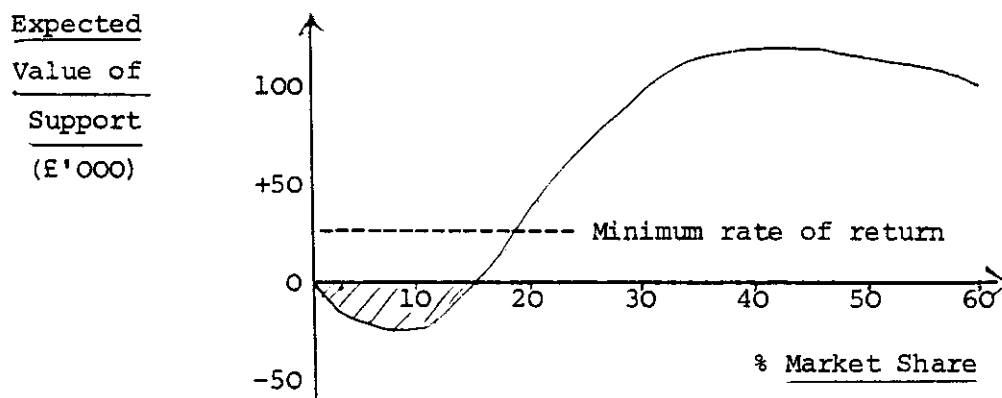
Market Share (%)	Pay-off (£'000)	Success Chance	Profit Consequence (£'000)
10	-75	.3	-22.5 (ie. $-75 \times .3$)
20	200	.4	80
30	400	.3	120

The overall, expected outcome of marketing A is $-22.5 + 80 + 120 =$
£177.5 (x 1000).

The expected value of necessary support is £22,500 since that is the magnitude of the risk as apparent in management's estimation of possible outcomes. For product B similar calculations show the 'risk' to be £6,000, again if only a 10% share is attained. This analysis suggests that it would be worth spending up to £28,500 to support the products to alleviate the 'risk'. There is no point in spending more than maximum expected loss.

The overall expected profit for product A is £177.5 (x 1000) and that for B can be shown to be £183 (x 1000) so that both are worthwhile ventures in which to continue to invest.

In order to make the example more realistic and complete it is necessary to be able to accommodate more than just three specific market share possibilities. What is usually done is that estimates are made for some of the intervening possible market shares and a curve is drawn to relate market share to expected value of support, as depicted below:



The area lying on the negative side of the axis (shaded) represents the total expected loss, that is the true expected value of support, over all possibilities. Another refinement that can be added is one of stipulating a minimum rate of return below which it is desired that pay-offs do not drop. This will increase the sum calculated to be worth spending to prevent the risk of loss on the product.

A further refinement is to accept the fact that there is a fair degree of chance attached to whether advertising support is a success. This refinement is described in Appendix E.

This decision theory approach would seem to have a particular value to aid in the decision whether to advertise at all for products where potential benefit is thought marginal. This might apply to minor brands or to declining products where the main aim is to keep sales just profitable or contributing a certain amount to overheads.

ADBUDG

Little (1970) 1757, has examined why management scientists' models and attempts to help make advertising and marketing decisions have not been very successful or well received by management. In order that such analyses of advertising problems and the resulting methods and models are able to aid management he has asserted that management scientists should construct models of advertising problem areas that are: simple, robust, easy to control, adaptive, complete on important issues and easy to communicate with. He believes that one of the problems with developing useful models and using analytic approaches is that of getting managers to use those that are developed and so help in their improvement. Hence he believes models should represent the views and opinions of the decision maker, not the analyst, and the manager should therefore feel committed to it and be in control of this aid.

Little has demonstrated the application of this cooperative approach to the problem of setting advertising budgets. The method evolved is called ADBUDG and essentially is a systematic way of using a manager's assessments of a marketing situation to set the advertising budget.

Managers must initially provide four basic estimates:

- a) If there were no advertising support for the product over the period being considered, what market share would result, this is termed 'min';
- b) What share would be achieved in the time period considered, if advertising were greatly increased, approaching what might be thought saturation level, i.e. what is the maximum market share achievable through advertising alone. This is termed 'max'.
- c) What level of advertising would be expected to maintain market share at its current level; this is termed 'maintenance';
and
- d) What market share would be attained if advertising were increased by 50% over that expected to maintain the current share.

These four estimates can be used to form a graph of market share response to advertising levels, as shown in Diagram 2. In the situation Little describes, this was felt to be an adequate representation of the market mechanism by the managers responsible for the product.

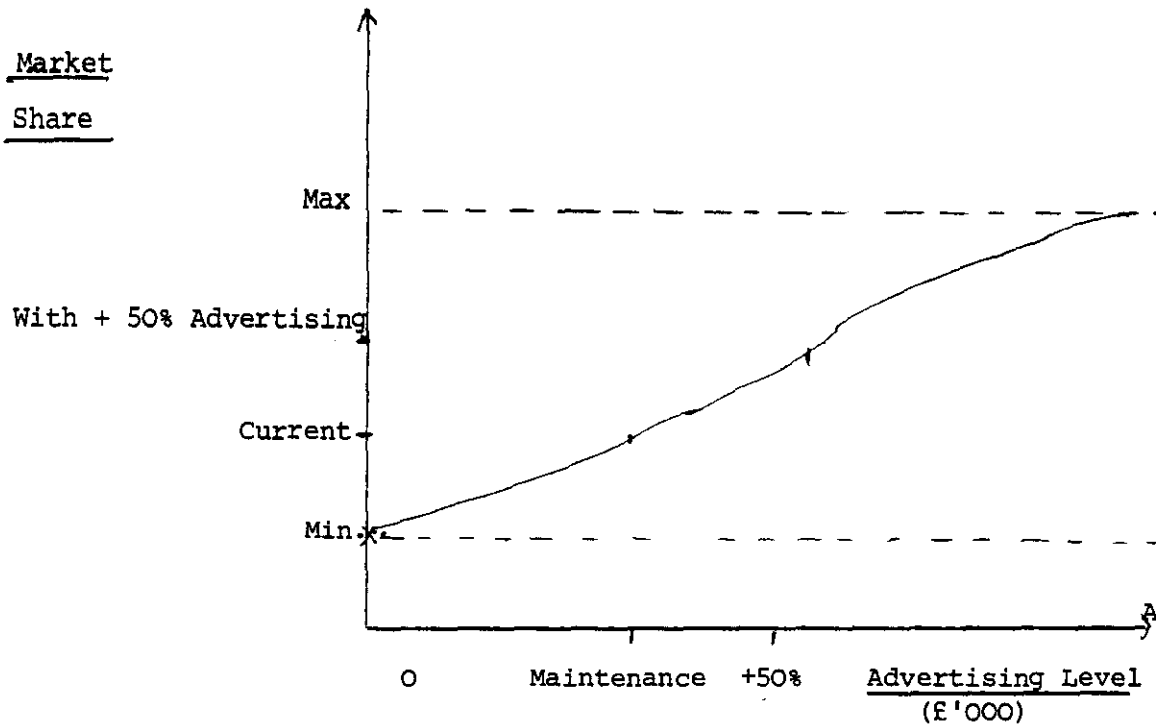


Diagram 2: Advertising Market Share Response Graph (ADBUDG)

A curve can be fitted through the four points and Little suggests the following form can be used for a wide variety of situations.

$$\text{Market share} = \text{min} + \frac{(\text{max} - \text{min}) (\text{Advertising})^g}{D + (\text{advertising})^g}$$

where D and g are constants determined for specific situations. If g has a value greater than 1 the curve is S-shaped giving initial slow growth which rises quickly after a threshold level of advertising and then reaches a plateau of diminishing returns. If g is less than 1 a concave curve obtains and growth in share rises quickly and slowly diminishes to a plateau.

Next, the ADBUDG procedure allows for advertising in one period of time to have an effect on subsequent periods as well as the current one. This is done by assuming brand share in the current period (t) is related

to the previous brand share (t - 1) by a decay factor but modified by the current advertising expenditure. The original relationship therefore becomes.

$$\begin{aligned} \text{Market share} = & \min(o) + (\text{persistence}) \cdot (\text{share}(t - 1) - \min(o)) \\ & + \frac{(\max - \min)(\text{advertising})^g}{D + (\text{advertising})^g} \end{aligned}$$

where,

$\min(o)$ = the minimum value of market that would occur in the long run if no advertising were undertaken.

persistence = a decay factor which represents the fraction of the difference between current market share and $\min(o)$ retained from one period to the next.

Because advertising expenditure decisions may be seen by the manager as inseparable from media and creative considerations the method allows for their subjective inclusion in the market share - advertising equation. In this equation, (advertising) is substituted by:

$$(\text{advertising}) = (\text{media efficiency}) \cdot (\text{copy effectiveness}) \cdot (\text{advertising}(\pounds))$$

Little suggests that media efficiency and copy effectiveness be related to maximum values of 1 and that managers must rate current advertising plans based on experience, media research and/or pre-testing exercises.

It is acknowledged that other marketing activities may affect the product's market share and can influence a manager's consideration of what advertising budget to set. Such activities may be: promotions, distribution, price, product changes and pack changes. In Little's methodology these factors are taken into account in a way that it is felt managers would attempt to handle them in the absence of ADBUDG. Simply, the manager is required to construct an index of how he believes these factors will affect brand share in the period under consideration. The ultimate brand share is then calculated as the result of multiplying the market share derived from the advertising response formula by the non-advertising factors' effect index. i.e.

Market share = (share due to advertising), (other factors' effect index)

To convert market share to actual sales figures, Little advocates the use of reference to a product-class-sales-index which includes seasonality and trend allowances. He also describes a method for allowing that the whole market, or product class, may respond to the advertising of one of the constituent brands or products and also be subject to time lag effects.

In summary, the procedure described by Little suggests that managers estimate the outcomes of various activities and then these are systematically combined to estimate the overall outcome via the following formulations:

$$MS(t) = AS(t) \cdot OFI(t)$$

$$AS(t) = \text{Min}(o) + P_s(AS(t-1) - \text{min}(o)) + \frac{(\text{Max} - \text{min}) \cdot A_s(t)^g}{D + A_s(t)^g}$$

$$A(t) = Me(t) \cdot Ce(t) \cdot (\text{Advertising}(t))$$

where, $MS(t)$ = market share in period being planned(t)

$AS(t)$ = market share due to advertising

$OFI(t)$ = other factors effect index

P = persistence factor - described previously

$Me(t)$ = media efficiency

$Ce(t)$ = creative effectiveness

and

$$\text{Brand Sales}(t) = (\text{Product class sales}) \cdot (\text{Product class sales index}(t)) \cdot (MS(t))$$

In conclusion it can be seen that ADBUDG is a fairly simple formulation that would enable a manager to make prognostications based on his objective estimates of the way advertising works in his market. Little advocates that such formulations should be available via desk top computing facilities to enable the manager to feel around possible decisions. The emphasis in Little's example on the need to predict market share outcomes suggests that his use of such an approach was to

a well established, frequently purchased product in an advertising competitive market.

It will be apparent that ADBUDG is a less comprehensive version of the procedures described previously under the headings DEMON (page 44) and Ayer (page 47). These latter methods are able to utilise the qualitative conclusions from data on previous advertising as well as data on other marketing influences. They are necessarily more complicated but arguably a more complete description and representation of the market place; they are strictly concerned with advertising decisions for new products since competitive effects are not included. ADBUDG is meant to be useful for an established product and is meant to include allowance for competitive effects by formulating response in market share terms. It is essential that its use would be suitable where large changes in advertising outlays were not envisaged and competitive activities were stable.

Hence ADBUDG could be seen as the first step in the use by a manager of a model of the market process for arriving at estimates for advertising budgets. As familiarity was gained with such a method and the desire fostered to use something more comprehensive, a more detailed model of the DEMON or Ayer form could be introduced. It should nevertheless retain the clarity of understanding and ease of use that the simple form possesses.

Aaker - ADMOD

Aaker (1972) 1976, has proposed a media selection model which includes a response function containing 'copy' and 'repetition' factors. Aaker notes that for the problem of setting advertising budgets:

"research has focussed in the past upon media allocation and copy evaluation (and) these two areas have been remarkably independent of one another... Research (into determining advertising budgets) has also tended to be isolated the three problem areas are closely inter-dependent and an effective approach toward one ... needs to include the other two. Further, all three decision areas need to be considered in the context of a particular advertising objective."

Essentially, Aaker is asserting that he believes the advertising budget decision must be made in combination with the other decisions regarding advertising. These could be summarised as:

- overall advertising objectives
- target population
- creative treatment
- media vehicles
- timing - when and how often/week

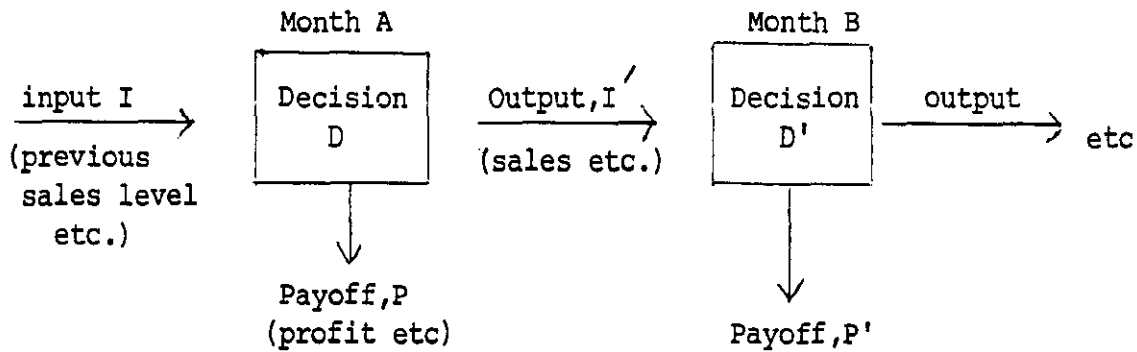
For anyone who prefers to formulate, or visualise, their advertising budget decisions primarily in terms of the media allocation decision, Aaker's formulation offers interesting possibilities for including other factors. It allows inclusion of the extra considerations of creative content and repetition on potential purchase response. Aaker stresses the operational need to consider segments of the target population who may have different economic values to the marketer and may also respond differently to creative treatments.

Aaker does not report any results of the use of his model although it is eminently testable. It would seem a suitable starting point for anyone wishing to expand the use of a media allocation/scheduling procedure to help make budget decisions.

Dynamic Programming

Dynamic programming is a mathematical technique which is appropriate to tackling problems where a series of consecutive decisions have to be made and where the result of one decision will affect the outcome of subsequent ones. Some marketing situations are akin to this set of circumstances. For example, in the plan for a new product introduction one must map out the promotional expenditures required at various points over what might be a two year period. The total promotional funds over this period will be limited and the problem is to decide how to phase expenditure: should a large amount be spent initially or should promotion be more evenly spread? If a large amount is spent at the launch this will affect the role of and the response to subsequent advertising.

Diagrammatically the situation could be represented as:



Decision D' is dependent on decision D and its consequence, output I'. The requirement is to maximise the sum of the payoffs.

Now Bellman's Principle of Optimality (1957) states that:

"an optimal policy (set of decisions) has the property that, whatever the initial state and initial decisions are, the remaining decisions must constitute an optimal policy with respect to the state resulting from the first decision"

This rather benign statement underlies what has been developed into a systematic solution procedure capable of solving complex, sequential decision policies. The computational procedure is capable of dealing with any number of sequential decisions, as long as the total is known, and any number of outputs, as long as these are known as well.

A hypothetical, worked example may make the principle of this method clearer:

Assume that advertising expenditure decisions have to be made at three points in time. Various expenditure levels can be decided upon (A,B,C,D,X) at these times. The probable outputs, in terms of sales are given as the cell entries in the first line of matrices for each stage and the second line of matrices give the profits for each decision in advertising level. (in the diagram below)

		<u>Decision Stage</u>				<u>Decision Stage</u>				<u>Decision Stage</u>			
		3				2				1			
Advertising level	Previous Sales Level	A	C	D	E	X	A	C	D	X	A	B	D
	1	4	2	1	6	1	2	5	1	1	2	1	
	2	6	4	4	6	2	3*	4	3	2	4	3	
	3	4	4	4	2†	3	4	5	4	5	3	4	2
	4	4	4	2†	2	4	4	5	4	4	4	3	4
	5	2	6	2	1	5	3	4	2	3		5	5

1	3	4	1	4
3	2	4	3	5
→ 4	3	3	5	4
5	4	2	3	2

1		1	5	4
2†	5	4		
4	3	3	3	
6	3	5	4	2

1	2	1	3	
2	4	3	2	
3*	3	5	4	3
4		4	3	5
5			4	5

Blank cell entries indicate inadmissible decisions.

Given, say, the input to the stage 3 decision of 4 units, what is the policy which optimises the payoff? It can be shown that the optimum policy is:

- decision D at the third stage
- decision X at the second stage
- decision A at the first stage

which leads to a cumulative total payoff (profit) of 5 + 5 + 5 = 15.

The recursive, mathematical procedure for calculating the best decision sequence is described in Sasieni et. al. (1959), 1977,

In the example cited the advertising budgets over the period of the three decision points would be in the sequence: A, X, D.

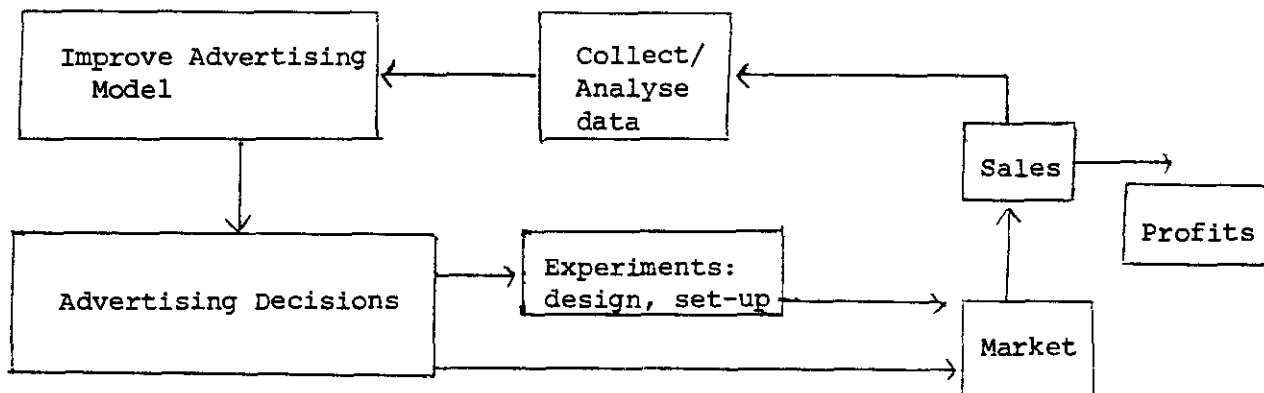
This method is somewhat theoretical for many circumstances but where the great concern is centred on the need to make interrelated, sequential advertising expenditure decisions, it is highly appropriate. It does require that

estimates can be made of the likely outcomes of various levels of advertising on the system. Hence it is probably most appropriate to a product which is the predominant one in an advertising responsive market.

An interesting corollary drawn from the methodology of dynamic programming is that if the effect of advertising on a consumer is seen as the result of a sequential management process then the overall level of success of the whole process is dependent on how good a decision is made on the last step in the chain. The last step, the one that impinges on the consumer, is embodied in the advert, itself. Consequently an advertisement of 'poor' creative content cannot be retrieved by great media expenditure: a better creative advertisement will always be capable of out-performing the poor one, given adequate media support.

Adaptive/experimentally derived data models

Some observers have noted the difficulty of determining the best advertising expenditure strategy using only data on the market responses that happen to have accumulated over the last few years. Such people have suggested that there should be a continuous advertising research programme whose aim is to systematically improve the advertising expenditure decisions. The systems they propose generally require that a series of area tests, or experiments, be conducted and the information from these used each year to help make the advertising decisions. The systems proposed are of the form:



As noted in Report No.5, the MCRU has reported on the many difficulties of conducting area advertising experiments, particularly in the U.K. The difficulties can be overcome with considerable management attention to details of the statistical considerations and personnel control. In Report No. 2ii, the MCRU noted the existence in the U.K. of successful multi-area, multi-product experiment aimed at testing an advertising expenditure model. It must be noted that this experiment was conducted over 4 years and was not inexpensive.

Little (1966)³⁰⁸, has described a procedure for conducting a continuous exercise to help determine the advertising budget. It combines new data about the various parameters in the underlying model, derived from continuous field experiments, with historical information for the purpose of up-dating the statistical description of the sales response function. Hence the decision maker may change advertising expenditures from period to period, based on systematic up-dating of the model, while also monitoring the process through ongoing field experimentation. For the technically interested, Little uses exponentially smoothed past data combined with the latest market data.

Fitzroy (1965) 546, has also examined the way such systems can be operationalised. His model assumes that the functional relationship between sales revenues and promotion involves certain parameters, represented as random variables, whose statistical properties are only partially known. If perfect knowledge of these parameters were available the optimum promotion level could be calculated using calculus. Instead, a policy has to be determined which approaches as close to the optimum as can be ascertained in the circumstances, i.e. the policy converges to the optimum as more information is received. Because of the lack of perfect knowledge, the model has two decision variables i) the promotional level that must be set period by period, and ii) the information level, i.e. how much should be spent each period to estimate the unknown parameters. The promotion level is set using the best available information. Data acquisition expenditures in the model are set to minimise the sum of two costs: the direct cost of the information gathering and the cost resulting from decisions taken on the basis of imperfectly estimated parameter values, as described in the section on Decision Theory.

Little 'tested' his suggested procedure for setting advertising budgets by using it in a simulated market over a period of many decisions. The usefulness of the procedure was judged, from this test, to be the difference between profits using the procedure and profits that could have been realised if everything about market response was known perfectly by the decision maker. Little's results show that for the market situation examined the loss through using the adaptive procedure was less than that using a fixed policy (e.g. fixed a/s ratio). The adaptive procedure in general gave results less than 5% different from the theoretical optimum.

The underlying philosophy of the adaptive model approach has much to commend it; essentially it involves systematic learning. Little's version does not, however, allow for carry-over effects of advertising from one period to another and competitive effects and reactions are not explicitly catered for. This model does not include allowances for the possible effects of other market mix elements, such as price, distribution, promotion, on the effectiveness of advertising.

Consequently, the adaptive/experimental approach is probably most readily applicable to products in markets that are fairly well established, stable and competitive, primarily through advertising. An example of this category might be some packaged foods or a personal care product.

CONCLUSION

In this section we have reviewed what appear to be the most useful contributions made by the management science approach to setting budgets. Little reference to those who have built models of consumer behaviour has been made. This is because such approaches are not primarily concerned to set advertising expenditures. Such approaches are of relevance to budget setting, in the sense that any procedure which helps explain why consumers behave as they do will help in understanding the market and deciding what has to be done in advertising terms. Knowing what needs to be done can go a long way to calculating what needs to be spent.

The emphasis of the section has been on 'horses for courses'; advertising expenditure methods derived and tested for a particular circumstance are primarily of use only in those circumstances. Under each method in the text the most appropriate circumstances have been specified. The following typology of methods is only a general guide to which may be useful, and anyone wishing to apply any of the methods should first consult the relevant section describing its shortcomings.

<u>Market Situation</u>	<u>Appropriation Method</u>
New products	NEWS; Ayer
Major product in small market	Vidale and Wolfe; ADBUDG, Dynamic programming
Minor products in large market	Simon; Decision Theory Method
Major products in large, static market	Weinberg; MAP; Adaptive (Little)
Major product in declining market	Decision Theory methods.
Durable goods in uncertain economic times	Consumer Expectations

THE PRACTITIONERS' VIEWPOINT

Introduction

As has been described in the two preceding sections, the manager responsible for making advertising budget decisions is assailed with a plethora of advice and aids from specialists. Necessarily many of the methods advocated by specialists are not universally applicable so their use is qualified. In the previous sections we have tried to highlight what appear to be valuable general principles and methods that could be applied straightforwardly in particular circumstances. Many actual circumstances a manager is faced with do not conform to the 'text book' circumstances, and the skill required is that of appreciating the important differences and modifying the 'answer' accordingly. There are often several crucial imponderables associated with making the optimum advertising appropriation decision and, faced with this situation, the manager must be pragmatic and do the best he can.

Much has been written by advertising and marketing practitioners on how the advertising budget decision should be subjectively made. In this section an appraisal is made of this advice to ascertain:

- (i) how justified is the assertion that the only viable approach is a pragmatic one;
- (ii) what practical steps are generally advocated and adopted and what overall marketing behaviour does this lead to;
- (iii) what conclusions can be drawn on the sufficiency of adopting some of the principles and practices advocated by practitioners.

The practitioners' case has been succinctly described by Treasure, among others, (1971) 461. His remarks on the considerations of advertising budget setting are directed particularly at branded goods and services sold through retail outlets. They are, however, appropriate to the pragmatic approach to advertising decision making. Briefly this view recognises that:

- (a) advertising decisions are made by people who are essentially businessmen; the purpose of advertising is usually clear-cut and accepted by those involved in its management as are the difficulties;
- (b) the results of advertising expenditures in terms of sales or profits must be evaluated in the long term as well as the short term, and the success of the total marketing package is the first goal.

Advertising is a contributory, but not necessarily separable, factor. Most budget decisions are made against a background of accumulated experience. Although the decision is primarily concerned with the next year's activities, it is made with the intention of maintaining the product's performance in the long term. The future is unknown and judgement must be brought to bear on this aspect of the decision;

- (c) the 'effectiveness' of advertising campaigns is a function of at least three variables: the expenditure, the media mix and schedule, and the creative content. Hence for many reasons it is usually impossible to measure the sales effectiveness of advertising simply in terms of expenditure changes;
- (d) advertising budget decisions are made under conditions of risk and uncertainty: the outcome of advertising decisions are longer term (compared, say, with price rises or below-the-line action) and so rely even more on the future environment. The risks associated with expenditure changes are reckoned to be greater than those attached to media or creative changes. However, because advertising is a flexible activity its budget can usually be seen as an insurance policy. Should other marketing ventures fail, the advertising funds can be used to meet other, more immediate, requirements like meeting profit targets;
- (e) competitive advertising does not lead to escalation in advertising appropriations. If anything, there seems often to be an accepted a/s ratio for a market with a communal - but not collusive - effort to try to make the market more profitable. If more advertising would ensure this, then all competitors would probably subscribe;
- (f) the main considerations in setting advertising budgets are:
 - (i) the accepted a/s ratio
 - (ii) what money will be left in the marketing budget when other costs have been met
 - (iii) the share of advertising expenditure in the market traditionally held by the product
 - (iv) the cost of media relative to media objectives of target audiences and exposures;
- (g) 'scientific' methods of setting advertising budgets are usually more trouble than they are worth. They are best tried by other people who, to date, do not seem any better able to solve the conundrum. It is probably worth doing some sort of area expenditure tests now and again, to check current expenditure is not either too low or excessive.

In the following section we will examine how justified managers might be in holding the views outlined above. It is recognised, however, that all facets of management considerations are not prescribed in the above synopsis.

How justified is the practitioners' view of the decision environment?

One of the most eloquent statements of the problem of making advertising budget decisions has been presented by Taplin (1959) 1113, as the result of a wide ranging study of advertising practices in British industry. He succinctly summarises the nature of much in-company debate by quoting a company director responsible for advertising decisions:

"the first half-million we have to spend anyway.

All the fights are about the last twenty thousand."

Taplin found that much argument about advertising would be reduced if it were possible to measure with any accuracy the effect of expenditure upon sales. His survey was conducted on 40 people in industry responsible for making advertising appropriation decisions. All had great difficulty accurately relating sales to advertising expenditures. The MCRC would confirm this finding in 1974.

Also Taplin found that it seemed virtually impossible to assess quantitatively the 'creative factor'. It was frequently possible to observe that advertising had some effect on sales in individual cases in the past and to forecast with fair confidence that it will have some effect in the future in similar cases. The positive problem of setting appropriation policies calls for decisions between more or less advertising, and the limits of this decision may not be very wide. Again, the MCRC would confirm that very, very few advertisers would claim to have precisely identified the effect of the creative content of advertising. Many, however, have examples where changed advertising content was associated with favourable changes in brand or product performance and the advertising is acknowledge to be a contributory factor.

Taplin's study revealed that appropriation policies were dependent on whether the product was new, established, or declining, which could presumably influence management preparedness to invest in the product through advertising. He also found that where marketing costs were small relative to production costs, advertising was used to 'boost' sales to maintain plant loadings

and other production considerations. Advertising was used in these circumstances sometimes in a 'fire-fighting' role. Taplin argued that, although he did not observe it, there was much to be said for using advertising as a stabilising influence on a product's sales where this was feasible. There would be undoubted benefits in some industries for being able to maintain steady production rates. Hence advertising would not be required to boost sales but maintain a status quo. To evaluate the pay-off due to advertising in this situation is probably difficult and not undertaken consciously by operational management. Although the MCRC's interviews in 1972/74 do not verify this as a major influence, nowadays it was noticed that advertising flexibility, and therefore budget changes, was restricted by production considerations. One company had to give its production management many months' notice of any deviation away from 'normal' advertising patterns.

Another cloudy area in marketing management which Taplin felt hindered clear advertising budget decisions was that of allocating marketing resources to other mix elements, e.g. quality, design, pack, price, outlets and product range. In other words, there are no clear criteria for deciding how much to spend on such things as pack changes - so advertising budgets cannot even be arrived at through a process of elimination or a series of deductions from an overall marketing budget. The MCRC experience is that many of the other market mix expenditures are prompted by demonstrations of physical needs, (e.g. more salesmen, inferior product properties) that are championed by self-interested people within the company. Advertising needs are demonstrable by market research, but are usually just one of the responsibilities of a marketing manager.

Taplin's survey found that media decisions and the associated technical problems of planning schedules and exposures tended to divert attention from the budget decision. The MCRC observations would not highlight this aspect, but certainly would mention that in some cases media considerations influenced budget size. It is felt by many marketing managers that there are thresholds for advertising expenditure in different media. Consequently if it is felt mandatory to advertise in a particular medium, for competitive parity reasons or whatever, then this does influence the size of advertising budget.

Earlier in this report full discussion has been given to the problems of relating advertising expenditures to subsequent profits or sales. Suffice it to say here that any simple observation of a relationship would still be subject to interactions with other marketing factors. For instance, a poor quality product would respond less to advertising expenditure than one equivalent in quality to its competitors. Similarly, if the price of a product is increased, will the apparent response to advertising decline? These points further emphasise the operational difficulty of making the advertising budget decision in isolation of other marketing circumstances. In a speech to the AAAA entitled "The Almost Impossible Dream", Gerhold (1969) 1979, asserted that, even with much better data on media exposure and purchasing and such things as ADLABS, the payoff from advertising in monetary terms still tended to be underestimated in quantitative analyses. A final point to be added on the side of practitioners who accept that advertising's financial effects cannot be measured is that, even if a sales response curve can be established (through experiments or whatever) it may well change with time. Consequently, if a company does mount a large analytical exercise to establish advertising effects on sales, for how long can they use the results for planning purposes to set advertising budgets? Some marketing researchers advocate that a continuous 'experiment' be maintained to update a sales response curve, but this would present considerable practical difficulties.

To answer the question whether practitioners are justified in their view that advertising decisions have to be taken pragmatically one must observe that advertising is the instrument of an overriding policy - the marketing or company policy. The MCRC would argue that this points to the need for precise marketing and advertising objectives which would more closely define the areas for necessary pragmatism in advertising decision making.

To conclude this assessment of the merits and acceptability of the practitioners' view of taking advertising budget decisions one can do little better than to cite Taplin (1963) 1103, from 'Advertising: a new approach':

"In effect the main problem in appropriation policy is to discover the right balance between measurement and speculation - a very difficult problem indeed and one which is certainly not confined to advertising. Indeed there is some justification for calling it the central problem of all business economics. In some

parts of the process (of production) and marketing exact measurement is possible and in others there is no alternative to pure speculation - a shot in the dark. At these extremes there is no problem. Nor is there any doubt that the attempt will be made to increase the areas of measurement. Advertising here is no different from other facets of business. But advertising will never escape from the dilemma which arises at the limits of measurement where maybe it is just as reasonable to guess as to spend time and money in a possibly fruitless search for precision of fact.

Every businessman who fixes a price takes a risk that it is too high or too low to maximise profit although he has spent ages on fact collection. There is no clear answer on pricing policy and similarly none on advertising. The central question is when to break off the search for mere facts and simply make up your mind."

How are companies said to budget for advertising?

Many surveys have been conducted to ascertain companies' advertising expenditure decision rules. Unfortunately few of these have attempted to learn why the rules were adopted. A summary of some of the main findings is given here to demonstrate the apparent universality of the findings.

Cover et al (1931) 1980, studied newspaper advertising space and sales for Chicago department stores. It was found that the amount of advertising reflected the seasonal and cyclical variations in sales.

Wagner (1941) 1981, examined department stores, cars and cigarettes and showed that advertising expenditure seemed to respond to changes in sales with anything from a zero to eight month lag.

Borden (1942) 1106, surveyed 215 large companies' practice during the 1930's. 54% stated that their appropriations were a predetermined percentage of sales, either of the past year or of the budgetted current year. Another 16% said they were guided in part by sales figures.

Another study conducted in the 1930's was that by Jastram (1949) 1982. He showed that 75% of large firms used set a/s ratios for determining advertising budgets. Further, he found that advertising expenditure was adjusted to maintain this a/s ratio if sales varied from that expected. Jastram repeated his surveys over a period of years, always gaining the same results (1932,1933,1935 and 1937).

By 1959 Taplin had published the results of his survey of over 200 U.K. firms. He confirmed U.S. general findings and also mentioned the influence of product life-cycles in the budget decision.

Bullen (1961)1983, found that 60% of industrial advertisers used the percentage of sales rule.

Yet others have presented their findings of smaller scale surveys or analysis of earlier studies (e.g. Weinberg (1960), Schwartz (1969), Conference Board (1968)). Generally they agree on the ubiquitous percentage-of-sales rule and admonish

"a more analytical approach to setting appropriations is required".

Interestingly Taplin's more qualitative survey of the subject allowed him to comment

"(the most common factor was to) regard some particular percentage of turnover as being a rough indication of the right level of advertising appropriation. A second common factor was the practice of treating advertising as a special type of cost, possible variations in which are separable from, and often considered after, all other items in the (marketing) budget and only before profit. The majority of firms said they practised both these policies..... there was no contradiction (however) because they were not applied simultaneously..... the percentage of sales was taken as a starting point."

From the MCRC's experience of discussing the advertising budget decision with executives within the group of 22 sponsor companies, it would seem Taplin's general observations still apply in 1974. As noted earlier, the fixed a/s ratio rule accords with the economists' finding that this can be the optimum policy in the short run, i.e. assuming advertising is not cumulative in its effects.

What practical factors should influence the decision maker on advertising budgets?

Some practitioners and marketing educators have summarised other considerations that should be born in mind when making the appropriation decision, over and above the apparently simple fixed a/s ratio rule.

Anyone concerned with developing an advertising budget must observe two fundamentals of budgeting:

- (i) the budget must be within the financial capability of the company;
- (ii) the budget must contain specific details on the allocation of funds to specific operations.

The application of a budgetary procedure contains four main steps: preparation, presentation, execution and control. As most of an advertising budget is spent on media, this highlights the dual considerations of media decisions and budgets. The size of a budget can act as a limiting factor on media choice and similarly if certain media are prescribed a minimum budget level is predetermined. Hence specific details of media plans must be available when making the expenditure decision since media and expenditure decisions are interdependent: one cannot be made prior to the other. This argument is elaborated at length in Wright et al chap. 17 (1971) 1984. Fortunately in the U.K. good forecasts can be made of media performance in exposure terms through the extensive media research that is available.

The other advertising decisions that must be concomitant with the budget decision are, according to Kotler (1972) 1500 ,

- " - What message and mode of presentation should be used?
- How should the advertising be phased during the year?
- What are the best methods for knowing what the advertising is accomplishing?

These can be seen to conform to the requirements of (ii) above. Research expenditure is involved in providing information to make the decisions enumerated by Kotler, but it is probable that in many companies it does not come out of the advertising budget. Perhaps if it did there would be a more total control of advertising planning and evaluation.

Kotler observes that, in general, there is a need to spend heavily on advertising where:

- " - products are alike - to create psychological differences
- at the introductory stage - to create awareness, interest etc.,
- at the maturity stage - to defend franchise and maintain share;
- in the direct response business.

The overriding criterion of how heavily to spend is generally argued to be the profit requirements of the company and whether these are short term or long term. As noted before, a new product which has not required expensive new plant does not have to generate profits quickly to pay-off large investment costs. Consequently, in this case, advertising could be more modest and of a different nature to build a long term growth potential.

Some other general considerations when formulating an advertising budget are said to be (Wright et al):

- "(i) the characteristics of the market: size, regional strengths, nature of the potential customers (age etc.)
- (ii) the characteristics of the product: the nature of the product; the relationship, if any, with media characteristics or any limitations inherent in the media
- (iii) the characteristics of the distribution system; what kind is used and the degree to which the distributive elements can communicate with all the companies' customers
- (iv) the sales promotion strategy: this needs to be co-ordinated with media advertising
- (v) the nature of the advertisement copy or creative content: what media are required to complement the content.

Taplin and Telser have both shown through their surveys of company behaviour that the extent of consideration given to competitive advertising activity varies very considerably. Taplin claimed that market leaders did not consider competitors' advertising, but assumed others followed their own lead, except in very competitive markets and where production processes were easily copied. In this latter case competitive advertising was continually monitored. The MCRC has found that only in very rare examples is a company's advertising expenditure altered away from that planned in response to competitive activity. The content of competitive advertising is never systematically examined it seems.

Palmer and Sampson (1972) 1599, in their treatise on advertising budget setting claimed that marketing managers were not in a position to attempt to maximise the use of any one tool in their armoury, be it advertising or whatever. They felt that marketing managers' decision making was directed along lines of search and discovery. Hence rules of thumb and guidelines were all that managers feel they need to enable them to set off in the right direction and learn as they go along. This view of management asserts that managers in this situation are 'satisficers' and they seek acceptable solutions based on an overall understanding of the situation.

This section has indicated some of the factors that must be considered to gain an overall understanding of an advertising influenced situation. The next section considers some of the pro's and con's of the guideline and rule-of-thumb methods said to produce acceptable budget levels.

Guidelines and rules for setting the Advertising Budget

A comprehensive list of all methods that have been suggested for helping to set an advertising budget are given in Appendix A . A synopsis of each is given there together with any merits each may have for particular circumstances. The most common methods that are advocated are discussed more fully here.

Percentage-of-sales or fixed a/s ratio method

As noted earlier this method would appear to be the most used in practice.

It has also been shown that economists believe this policy can optimise profits, if the right a/s ratio is chosen and a simplified view of the marketing process is accepted. In essence marketing managers set their planned advertising expenditure as a specific percentage of sales - either current or forecast, or of the sales price.

The MCRC found that many managers claimed not to follow this policy but when their own policy was probed it turned out to rely on the average market a/s ratio or the company's past behaviour which was a fairly static percentage of sales.

The policy has the advantage of being simple to apply. In the absence of precise knowledge on sales results from advertising the method is likely to ensure advertising varies with what the company, or brand, can afford. The method will, hopefully, encourage the manager to consider the relationship between advertising cost, selling prices and profits when appraising whether the right a/s ratio is being applied. Another advantage that might be claimed for this method is that it may encourage stability in a market. If all competitors tacitly follow a general a/s ratio policy they will avoid advertising expenditure battles.

The shortcomings levelled at the method are many. Firstly, on theoretical grounds, it implies that sales generate advertising. This may encourage advertising being conducted by habit and insufficient thought being given to why advertising is being undertaken, i.e. what is hoped to be achieved, what are the opportunities?

If some industry average is used to set a company's a/s ratio this may not be sound since no attention is given to the specific needs of the individual company; it may not be an average company; its marketing mix may be different to other companies and some rely on advertising more than others.

If a company uses its own past sales and advertising data to fix the a/s ratio it may over or under estimate present needs. If it projects sales and advertising figures to calculate the a/s ratio it will run into problems of forecasting. The method is likely to discourage experimentation and the dependence of the advertising budget on fluctuating yearly sales may also discourage the detailed planning of long term advertising programmes.

Another reason for the methods popularity is that it makes advertising become a variable cost rather than a fixed one. Hence it may be thought by the accounting fraternity to be more controllable. In fact although this procedure does control expenditure it does not control income which is perhaps equally important.

The method could be said to have merit for use by companies which face the same marketing conditions year after year, i.e. static markets where customers are unlikely to change from one supplier to another. In today's climate few organisations are probably in this situation including even the public utilities.

Unit of sale method

This is a variant of the percentage of sales method. A specific pounds (£) or pence amount is added to the selling price of each item. A forecast of total items sold determines the advertising budget. Again this method is simple and for campaigns run jointly for several products it eases the administrative burden. It has the same disadvantages as the percentage of sales method in discouraging the examination of the need to advertise. It is easy for the advertising addition to the price to become traditional and not readily altered to meet changing needs.

Comparison with competitors method

Companies adopting this method tend to accept one of two points of view. Some attempt to match competition, others try to spend more than their competitors. In the first case advertising is probably viewed as a defensive device "we spend as little as we have to."

One reason for adopting this strategy is the assumption that competitors' expenditure represents the collective wisdom of the industry "they must know what they're doing." Also, the maintenance of competitive parity is thought to help the market in general and avoid advertising wars.

Knowing what competitors are spending is useful information. Following their lead unquestioningly is another matter. The situation facing one competitor is different to that facing another; their marketing mixes may well be different. Similarly there are usually no grounds for assuming competitors are any wiser than oneself and there is only limited evidence that advertising alone stabilises markets.

The according-to-task method:

Advertising by objectives

Most other methods view advertising as a cost rather than a method of helping to achieve a business objective.

Simply stated the Task method involves a budget being built up through three stages. The manager:

- a) defines the role advertising is expected to perform in the marketing plan and what the specific objectives for advertising are;
- b) states how he believes these objectives can be accomplished and what must be performed to put this into practice; and
- c) estimates the costs of performing these tasks.

This procedure would involve objectives being set for each product, or product variant in each region. The sum of all estimates for each region would be the advertising appropriation thought necessary to achieve the objectives. Hence advertising budgets are built-up from component costs. Many of the other methods involve the need to allocate funds from a central advertising fund which is determined first. Hence regions are allocated 'what can be afforded' or on the basis of 'supporting strength', or 'supporting weakness' or on 'potential sales'. No one can agree which is best. The task method obviates the need for these sorts of decisions, so its protagonists claim.

The advantages of the 'advertising-by-objectives' approach were expounded at length in Report No. 6 'Setting Advertising Objectives'. In this same report the difficulties were examined of setting objectives when one did not have a clear understanding of how the advertising process worked. It was concluded that the problem had to be faced and tackled and that usually objectives could be set that could be measured. The important realisation seemed to be that in this situation one was normally only trying, through advertising, to make small adjustments to existing situations. The macro problems of how advertising works or what makes people behave the way they do have to be taken as part of the given environment (exogenous variables). Advertising objectives were seen as being to make small changes to some of the factors in the marketing mix, i.e. those things that one knows and understands and whose current values seem to be giving rise to the present level of sales, which one wishes to maintain or alter.

In its elementary form this method can be criticised as being naive: it fails to allow questioning of whether an objective is worth pursuing relative to its cost. For example, although it may be a reasonable marketing objective to expand product awareness by 20%, the cost of doing this through advertising in one year may be incompatible with the profit contribution of achieving the objective.

Making this additional constraint to the Task method would seem to remove the naivety. An additional improvement to the method would also involve the generation of several advertising objectives from which the most cost feasible has to be chosen.

Bogart (1967) 1149, has also criticised the Task method for its inappropriateness to help make the media choice decision. He feels that where an advertiser has the choice of using a medium or not (e.g. sponsor an event, buy a 'package' of T.V. spots or accept a 'bargain' offer of poster sites) the decision is to 'accept' or 'reject' and half measures are not allowed. The Task method, according to Bogart, is usually put into practice most effectively in devising media plans: the Task method might suggest the need for some T.V. advertising but the practicalities of buying T.V. time might require advertising to be wholly on T.V. or wholly in another medium because of discounts, for example. If the Task method is applied to the total process of planning advertising, from marketing objectives through to media scheduling, then Bogart's difficulty would be largely obviated. His point is a practical one which would be dealt with when one was considering the most cost effective ways of achieving objectives.

DAGMAR

The broad philosophy of the Task approach has been attempted to be formalised by Colley (1961) 28, in the study conducted for the ANA, "Defining Advertising Goals for Measured Advertising Results." Colley set out to show how advertisers can measure the return on their advertising expenditure and therefore, by implication, help to decide how much they should spend. As mentioned before, this approach is elaborated in Report No.6. As a textbook on how to set advertising objectives and as a lexicon of possible objectives for different circumstances Colley's book is admirable, brief and to the point. He concludes that to define advertising goals, information based on research, experience and judgement is needed regarding the merchandise, the markets, the motives, the messages, the media and the measurements in question.

"Information must be translated into strategy, strategy expressed in terms of goals. Measurement then becomes feasible."

The book is widely quoted and criticised predominantly for Colley's apparent assertion that advertising universally works through the process: awareness, comprehension, conviction and action. Of course this sequence can be shown to be irrelevant or untestable in some circumstances and it is unfortunate that the DAGMAR approach is not considered by many because of this.

Colley's case is perhaps not helped by his use of apparently hypothetical case studies of the use of the approach. The MCRC is currently exploring the applicability of the method to real situations.

The Affordable Method

This method of setting an advertising budget advocates spending as much "as can be afforded". In practice it is similar to other methods where advertising ends up being what is left over after all other costs have been met. It really reflects a state of mind towards advertising's purpose. As Dean (1951) 1733, described this approach :

"everything above a respectable return could be spent on advertising since excess earnings have low utility to management as such, compared with the possible contribution of continuous advertising to the life of the firm or product."

Peckham's Formula

Peckham (1969) 1984, has presented an analysis of the relationships between advertising and sales for a number of new grocery, toiletry and proprietary products in the U.S. He used extensive Nielsen store audit data and examined the relationships between market shares (by value) and share of advertising expenditures, rather than actual figures. It should be noted at the onset that the use of share figures does not allow for the fact that a market may expand in total when a new product is introduced. However, Peckham's conclusions, a 'Formula for Marketing Success', have been influential on marketing practitioners:

"sufficient advertising over a 24 month period to produce a share of advertising about one-and-a-half times that of the share of sales you plan to attain"

and

"enough advertising in subsequent months to maintain (the product's) share modestly ahead of sales position".

The evidence for these assertions is drawn from his examination of 34 "successful" new products. Success is attributed to those who achieved an established position in a market. For example new toiletries which were successful had a share of advertising about 60% greater than the share of sales they eventually attained. Those with the highest share of sales also had the highest share of advertising.

Peckham's study covered a variety of products each examined over initially a 24 month period of their introductions. Information on distribution and other promotional activity was not examined to show how they might contribute

to 'success' or 'failure' as well. The examples Peckham presents do tend to support his contentions, but it would be more convincing if 'failures' were seen to adopt opposite policies for advertising expenditure. Again, his arguments assume that all the other marketing factors were 'right' (quality, price, distribution etc.), which they probably were for the 'successes'. To be fair, Peckham stresses that his conclusions are drawn by inference from the fact that the average successful new product has an advertising share one and a half times its eventual market share over a two year introductory period. However, the individual case histories presented in his very lucid paper demonstrate the lack of consistent, precise relationships. To accept Peckham's dictates one would surely like to know why this weight of advertising is successful; what purpose is it fulfilling and could this role be achieved by any other means?

Another interesting result of Peckham's analyses shows that often the first new product into a market eventually ends up surviving with a lower a/s ratio than later, similar products. This is partly because they have higher market shares, or sales, anyway and partly because they need less advertising. It highlights the dangers, however, of doing multi-product analyses of market shares and a/s ratios as a means of setting ones own a/s ratio.

ADLABS

The subject of the use of ADLABS for advertising research, particularly expenditure research, was discussed in Report No.5. It was concluded that ADLAB facilities in the U.K. would be a very valuable research tool. It was stressed, however, that most would be gained from such a facility if its use was part of a company's programme of research and not just an ad-hoc, one-off study. Proving that double expenditure will sell more goods profitably will only be useful temporarily, in all probability, unless one understands why. The knowledge, or belief, why it has an effect at one point in time, could, hopefully, allow one to adjust when circumstances change, as they undoubtedly will do.

Books on the subject

Virtually no books have been written exclusively on the topic of setting advertising budgets. In most marketing/advertising textbooks the problems and main practices are discussed. Most of the well known papers on the

topic have been mentioned in this report.

One book published fairly recently deserves mention: "How much to spend for Advertising?", edited by Malcolm McNiven (1969) 557. It consists of a set of papers deemed by the editor to:

"expose the reader to a wide variety of methods and opinions about allocating funds to advertising".

Papers only offering opinions were excluded in favour of those felt to describe methodologies which had been used, and :

"may be used now in the solution of an advertiser's own problem of advertising expenditures".

The methods suggested by Weinberg and Peckham, described in this report, are included in this book. The main limitation of the book is that it fails to give any comment on the limitations of the methods described and a critical evaluation of successes and failures of using the methods. This report has tried to fulfil this role where possible. Another point worth noting is that one third of McNiven's book is devoted to experimental methods which are not thought by the MCRC to be very feasible in the U.K. for producing worthwhile results.

The MCRC's analysis of advertising expenditure by sponsor companies

In the course of the MCRC's study of the measurement of advertising effectiveness much information has been gathered on the history and total marketing effort associated with some thirty products or services. For completeness, some analyses of this data are presented here to see whether any guidance emerges for setting advertising budgets.

The thirty or so case histories do span the spectrum of fast moving consumer goods to durables and services. However, the sample is not large enough for precise conclusions to be drawn or theories tested. The products are listed in Report No.6 and the extent of quantitative information on each product or service (some 27 items) is given in Appendix G. A separate report will be prepared detailing all the analyses done on this data.

Great reservations have been expressed earlier in this report about comparing one's own advertising expenditure, or a/s ratio, with that of competitors or market averages. A high a/s ratio may signify that a company is trying to compensate for product deficiency through advertising; a low ratio may indicate that product quality, or price, act in a quasi-promotional way. Or, simpler still, below the line promotion may be used more by some products, to help retain distribution for example.

Table 1. Advertising/sales ratios by product category

Category	Example	Sample size	Average a/s ratio(%)	
			1973	1971
New Products	Foods, personal care, cars, drink	6	33.3	-
Established Products	Foods and drink	15	7.16	6.81
Commodities	Fuels, cars	5	0.73	0.61
Durables, semi-durables	Electrical goods, household goods	2	14.5	19.5

Table 2. Advertising/sales ratios by stage of life-cycle

Life-cycle stage	Example	Sample size	Average a/s ratio(%)	
			1973	1971
Introduction	Food, Personal care, drink	5	40.2	-
Growth	Foods, drink	8	7.94	7.65
Maturity	Food, drink, durable	3	3.36	3.6
Decline	Foods, personal care	5	13.9	11.6

Because of the difficulty of classifying some of the products not all examples available were used in deriving Table 2.

Many possible relationships were explored between advertising/sales ratios and such factors as price and sales and the other possible influences on the level of advertising. One relationship which did emerge as statistically significant was that between the a/s ratio for a product and the extent of market share held by own label products. The actual figures are given in Appendix F

The relationship found is by no means conclusive for 1973, and did not appear to hold for 1971's data. There is really insufficient information and there remains only the suggestion that by 1973 those markets where own label products had a small share were also those markets with high brand a/s ratios.

Explanations of the differences between a/s ratios and between advertising levels

In order to examine some of the reasons giving rise to different a/s ratios, or levels of advertising, between different products simple correlations and multiple regression analyses were carried out on the data described in Appendix G for 1973. This sort of exercise is usually called a cross-section analysis. The MCRC is well aware of the limitations of this sort of exercise and the findings are presented for interest to see how well they confirm general beliefs as to what influences the magnitude of a/s ratios, or advertising level. If there were data on more than 30 or so products and services then it is realised that some form of discriminant analysis would be more appropriate to indicate the apparent decision criteria. However, if advertising expenditures are actually made in a somewhat subjective way there is a very real danger that one could invent a pseudo-scientific formula of the relative importance of various factors from a set of related, but not necessarily causal, facts and data. Only if one had data on very many products and services, all of which confirmed a particular formula, could one suggest that managers used this formula, either consciously or unconsciously. The MCRC does not have sufficient examples to explore how different factors in different circumstances may quantitatively influence the advertising expenditure decision. It is better to seek this through direct enquiry and also learn about the non-quantitative factors' influence.

Hence, other than to confirm that product sales and price levels are the main influence on the variation in a/s levels between products, the results presented here just indicate the direction of influence other factors may have.

For all products and services in the sample (less the BTA) the following form of relationship explained 74% of the variation in a/s levels:

$$\log a/s = K - \log (S) - \log (P) - D$$

where, K = constant

S = sales (£)

P = price(pence)

D = a 'dummy' variable set to 0 for all products except durables and semi-durables.

This relationship is the same as that found by Doyle (1968) 1985, after an analysis of data on 68 product categories. Various product categories were examined in the same way, e.g. new products, established food products, old products and neo-commodities, durables. Although the sample sizes were small it was found that the above relationship, less the need for a dummy variable, explained between 41%, in the poorest case, and 89%, in the best, of the variation in a/s ratios.

For all products and services (less the BTA) the following relationship explained 67% of the variation between actual advertising expenditures in 1973:

$$\text{Advertising (£)} = K + P + S + D + MA - MS$$

where, K = constant

P = price (pence)

S = sales (£)

D = distribution level (%)

MA = total advertising for the product category

MS = total product category sales (£).

It should be noted that the price of a product and its total sales revenue are not independent of each other and distribution levels are also probably partly influenced by sales levels.

When sub-groups of products were examined the main additional factor to emerge as an apparent influence was the degree of seasonality of sales. The more seasonal a product, or service, the lower its a/s ratio and advertising expenditure.

Conclusion

The limited analyses presented here confirm that, generally, advertising/sales ratios or advertising expenditures are influenced by sales and price. The magnitude of a/s ratio for different products seems closely related to the stage of the product's life cycle (Table 2).

SUMMARY AND CONCLUSION

This report has summarised various viewpoints on how advertising budgets are, and should be, set. Economists would seem to advocate the marginalist principle leading to a fixed ratio of advertising expenditure to sales income. This primarily assumes the purpose of advertising to be short term in nature and that such things as sales elasticity to both advertising and price are known. The management scientists/marketing researchers have tried to model market behaviour as it appears to respond to advertising inputs and, in some cases, other marketing factors. Their models are necessarily abstractions of the real world. No one model comprehensively covers all situations. In fact, it is argued in the report that particular models can have a value in particular circumstances. This value, it is suggested, is to provide an 'order of magnitude' estimate of the appropriate advertising budget. The practitioners' outlook on the problem is that it is necessary to weigh the total marketing situation carefully and judiciously decide how much money should be spent on advertising. The area of estimate is very heavily influenced, however, by what amount of money can sensibly be made available out of sales income.

Each of these viewpoints contributes to the understanding of the problem. It is demonstrated in the report that the 'Task' approach will clarify and make more precise the role advertising is expected to play. It is also demonstrated that certain 'models' of advertising/marketing situations can help systematise the decision process or provide a method for accumulating product advertising experience, i.e. aid the learning process.

It is therefore advocated that the Practitioners' 'Task' approach, together with an appropriate model (as listed on page 70) be the route to setting advertising budgets.

Appendix A

A Summary of Methods of Determining Advertising Appropriations

For completeness this appendix lists all the main methods that can be used to set advertising appropriations, or budgets; brief summaries are presented here of the main advantages and disadvantages of each method. Those predominantly used procedures have been discussed more fully in the body of the report. A discussion of some of the more obscure methods can be found in Jefkins (1973) 1957.

1. Intuitive, rule of thumb methods

These procedures are defined as arbitrary being the result of someone's subjective assessment of what "should do the job." The assessment is often an amalgam of hunch and experience and is very dependent on the person making the decision: should he be replaced an expenditure of a different order of magnitude is capable of being necessary "to do the job" since another person may have had different experience. As companies try to exert finer control over all their activities unsubstantiated hunches or guesstimates become less and less easily accommodated into management accounting and management by objectives systems.

2. Maintaining previous expenditure

Here an advertiser would aim to spend the same amount from year to year with perhaps adjustments to take account of inflation in advertising costs. This procedure treats advertising as a fixed cost and could be criticised for being unenterprising, unresponsive to changing situations and likely to lead to poor returns from the advertising.

3. Percentage of Previous Sales Turnover

This procedure has grave limitations in that it is not responsive to new market situations and may compound previous poor trading. Although it

might be argued that this method is suitable for a small company wishing only to maintain its sales levels, there may be more cost efficient means of doing this and this overall method is not recommended.

4. Residue after last year's profits

In this procedure advertising funds are determined from what is left after the required level of profits for distribution, has been subtracted from overall profits on the previous year's turnover. The idea of ploughing back profit into the development of the product may have some merit in certain circumstances: advertising is being treated as a re-investment in the future. This policy would require knowledge of the expected return and the timing of this return but since this is usually not known it would be difficult to justify this method financially.

5. Percentage of Gross Margin

Advertising expenditure is here calculated as a percentage of the residue after production and marketing costs have been subtracted from sales income. Advertising is seen as being discretionary and different in necessity to other marketing costs. As sales turnover increases both profit and advertising will increase and vice versa. This method does not allow advertising to be used to help increase profits, both are subject to the success of the other market mix elements. As discussed in the main text this method has the attraction of 'keeping advertising expenditure in proportion to turnover and profits' but does beg the question of what advertising is for. It is likely to be wholly inappropriate for new products.

6. Percentage of Forecast Sales Turnover

The philosophy of this approach is discussed at length in the main body of the report. Essentially it is concluded that in the right circumstances and with certain knowledge on the responsiveness of sales to advertising this method has a value for arriving at the right order of magnitude of expenditure for subsequent adjustment in the light of other factors.

7. Fixed Expenditure per Unit of Sales

In this method every item sold is assumed to carry a fixed overhead cost of advertising it. More usually this is expressed as the contribution to advertising per item, for example, "5p. per case for advertising". This procedure is born of standard costing procedures and forces management to think of advertising as fixed cost rather than a variable one. To arrive at annual appropriations sales forecasts are made which automatically yield the required advertising figure. This method is very akin therefore to that of 6 above, and is subject to its general limitations. An extreme example of the limitation of this method might be a theatre which allocated a fixed amount towards advertising per seat booked: as bookings diminish so does the advertising promoting the show, which may be counter productive.

Companies adopting this policy very often apply it rigidly across all products which ignores market differences and individual product requirements.

8. Matching, or in relation to, competitors' advertising

In this method the aim is to copy competitors on the assumption that either they know the right amount to spend or that there is a market 'norm' which must be subscribed to. Knowledge of competitive expenditure will be useful to a new product entrant into a market but the real determinant of advertising expenditure must be what role advertising is to play and how much this will cost in the light of competitive activity. As mentioned in the main report it has to be remembered that competitors' circumstances may be different and they may be using advertising for different purposes, e.g. to bolster a slightly inadequate product or to promote a long term, strong brand position and forego some current profits.

9. Matching brand share to advertising share

This procedure is a development of the previous one in that it attempts to allow for advertising expenditures of rivals being related to their respective size in the market. Extensive discussion of the merits of this approach are made in the main report in the section on Practitioner's Approaches where the results of a major study of this topic by Nielsen are presented.

10. The marginal return approach

In this method the cost of an extra unit of advertising activity is compared with the expected return in increased profit which will result. This method is only applicable where advertising is the chief form of promotion and is only really practical for direct response and mail order businesses that can actually monitor individual responses to advertising and calculate associated profits.

11. The task approach

Essentially this method requires that an objective for advertising to achieve be set and then the cost of achieving this is determined. The way this is often done is to break down the overall objective into sub-objectives for which it is often easier to set cost figures and then to sum up the individual costs to give the overall budget. . Often the most tractable objective to set for advertising is its role in the overall marketing process e.g., the conviction by a certain proportion of the target population that a product has certain properties. The cost in media terms can usually be readily ascertained. The task method is claimed to be the most logical way to arrive at advertising budgets and it is certainly admirable in its insistence that objectives be specified first. Many of the other methods encourage the utilisation of advertising via the route 'we will have £X to spend on advertising, how best shall we spend it?' The only drawbacks to the task method are that

- a) it is very reliant on the overall objective and sub-objectives being the 'right' ones, and
- b) it may produce budget requirements out of all proportion to the company's or product's capability.

If marketing objectives are set with due regard to cost of achieving certain advertising sub-objectives, suitable compromises can be made such that realistic targets can be set for advertising and costed out accordingly.

12. Marketing Model

This method usually purports to demonstrate the mathematical relationship between sales, or profit, and each of the main marketing mix elements, including advertising. To derive such a model, or set of relationships, which correctly describes individual influences is very difficult. Only where such a model has been put to the test in a field experiment is it wise to place much reliance on such methods.

This overall approach has much to offer and there are many different ways of modelling markets. The advantages and difficulties are extensively discussed in the main report predominantly under the section: the Management Scientists' contribution.

Media scheduling models are not considered in this report. They are very useful planning and scheduling aids given specific objectives for media. They can influence budget decisions to the extent of giving feedback to a marketing manager of what a certain level of expenditure will achieve in coverage and frequency of exposure of advertisements in the specified target population. If this does not meet the media objectives the budget and the objectives will have to be reviewed. Media models have been extensively reviewed in the MCRU's Occasional Paper No. 2 "Approaches to Media Scheduling".

13. Cost per capita

In this method an advertiser calculates the advertising cost per head for his present customers and when wishing to increase sales by gaining more customers calculates advertising expenditure on a pro rata basis.

This sounds a simple method particularly for industrial advertisers or durable markets where customers purchase only one of an item at a time, e.g. a central heating system. It does also have the advantage of forcing the advertiser to consider the size of his target market and who his potential customers are. The limitations of the method include the fact that it may be progressively harder to persuade new customers to buy and the effects of competitors' advertising are ignored.

14. Composite Media costs

This method is really an allocation of the 'task' procedure. When specific media are assigned specific tasks the overall appropriation is the sum of the individual budgets. For example, a mail order company might use the Press to attract new customer enquiries, direct mail to gain further orders from past customers and catalogues to prompt additional sales from existing customers: each medium would have individual objectives and acquire budgets to achieve these. This method is particularly appropriate for mail order operations.

15. The 'Total' Approach

In this procedure an attempt is made to take into account and blend all the influences on the advertising appropriation, namely:

- a) past sales
- b) forecast sales and profit requirements
- c) production capacities
- d) market environment - competitors, economy, political trends
- e) product performance - adequacy, perception of quality etc.
- f) sales force strength
- g) distribution strength and problems
- h) seasonal factors
- i) regional factors
- j) availability and cost effectiveness of media
- k) trends in the market as revealed by research

16. Agency quotations

A ploy adopted by some companies new to advertising is to seek advice or quotes from advertising agencies. Unless very clear objectives are stated this procedure is likely to produce diverse estimates, each one appropriate to the problem as perceived by each agency. To appraise the value of any advice a company needs to know the method used by the agency to arrive at its estimate.

17. To Expand Distribution

In some circumstances advertising is undertaken to persuade retailers to stock goods. Where goods are sold on dealers recommendation, or where

availability is the prime influence on product purchase, such advertising may well be desirable. The amount expended should depend on precise knowledge of the amount of business, and therefore, profit involved.

18. Experiments

The use of media weight experiments to help determine advertising budgets has been reviewed in the MCRU's Report No. 5. Briefly it was felt that it is extremely difficult to obtain conclusive findings from this method.

Appendix B. The demonstration that the constant a/s ratio and marginal utility principles are synonymous

As has been demonstrated in the main report, Dorfman and Steiner, among others, have shown that where sales are primarily determined by price and advertising, optimal profit occurs where:

$$E(\text{price}) = E(\text{advertising}).$$

Where:

$$\begin{aligned} E(\text{price}) &= \text{the elasticity of demand with respect to price} \\ &= \frac{p \Delta q}{q \Delta p} \end{aligned} \quad \begin{array}{l} p - \text{price, } \Delta p - \text{small price change} \\ q - \text{quantity, } \Delta q - \text{small quantity change} \end{array}$$

$$\begin{aligned} E(\text{advertising}) &= \text{the marginal value of a small change in sales} \\ &\quad \text{due to advertising, at a given price of the goods.} \\ &= \frac{p \Delta q}{\Delta a} \end{aligned} \quad \begin{array}{l} a - \text{small change in advertising} \\ \quad \text{expenditure} \end{array}$$

An appraisal of Dorfman and Steiner's work in Bass et.al. (1961) 1951, has indicated that if one explores the situation where sales are required to be held constant and the optimal advertising level is to be chosen then if one ignores production costs, a company will alter the price and advertising level in such a way as to increase profits. Hence the change in net profit will be the constant sales volume multiplied by the change in price, less the incremental increase in selling effort, i.e. advertising. When the marginal profit becomes zero, that is, an increase in advertising no longer allows a further profitable sale, then advertising has reached an optimum level. Hence the optimum situation is defined as that where marginal profit is zero, therefore:

$$q \cdot \Delta p - \Delta a = 0 \text{ or } q \cdot \Delta p = \Delta a.$$

$$\text{and } q \cdot \Delta p = \frac{p \cdot \Delta q}{E(\text{price})}$$

$$\text{and } \Delta a = \frac{p \cdot \Delta q}{E(\text{advertising})}$$

therefore,

$$\frac{p \cdot \Delta q}{E(\text{price})} - \frac{p \cdot \Delta q}{E(\text{advertising})} = 0$$

$$\text{or } E(\text{price}) = E(\text{advertising})$$

$$\text{This finding means that: } \frac{p \cdot \Delta q}{q \cdot \Delta p} = \frac{p \cdot \Delta q}{\Delta a}$$

$$\text{or } q \cdot \Delta p = \Delta a$$

But $q \cdot \Delta p$ is the change in total revenue due to a small increase in price, i.e. it represents marginal revenue, and, Δa is the change in total cost needed to bring about a change in marginal revenue (since production costs are ignored), i.e. it represents marginal costs.

Hence under these assumptions and conditions Dorfman and Steiner have, in effect, used the principle that the optimal policy is where the marginal return to a small increase in advertising is no longer profitable. Their extended analyses on constant a/s ratios is therefore founded on this principle and will reduce to it.

Appendix C. Some definitions of terms used in the report in relation to
Economists' Viewpoints

Elasticity of Demand

This is the degree of responsiveness of demand to a change in one of the market mix elements. In the case of advertising expenditure, the elasticity of demand with respect to advertising could be defined as:

% change in sales

% change in advertising

for a very small change in advertising level.

Operationally, elasticity can be thought of as the relationship which links a change in sales to a change in advertising level. In the simple relationship

$$\text{Sales (€)} = A \cdot (\text{Advertising (€)}) + \text{Constant, } C.$$

$$Y = A \cdot X + C$$

where sales and advertising are expressed in the same units, A would be the slope of the line as illustrated in Figure 1.

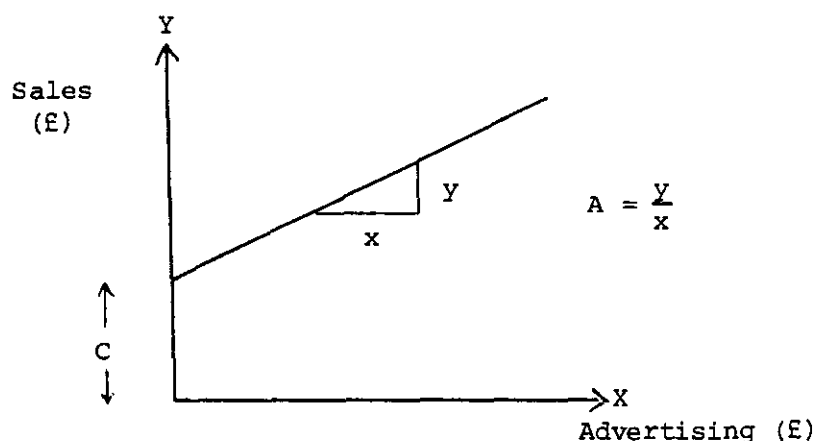


Fig. 1. An illustration of an operational derivation of Elasticity,

Usually A is calculated for a small change in y, signified by dy. Hence A is usually represented by dy/dx . A precise mathematical definition of elasticity can then be derived in these terms:

$$\text{elasticity} = \left[\frac{dy}{y} \cdot 100 \right] \div \left[\frac{dx}{x} \cdot 100 \right] = \frac{x}{y} \cdot \frac{dy}{dx}$$

$$\text{or} = \frac{\text{Advertising} \cdot A}{\text{Sales}}$$

Much econometric work involves taking logarithms of both sides of equations representing relationships between sales and the variables influencing sales. The advantage of this operation is that elasticities are automatically derived if the relationship involves multiplying the variables. For example, if $y = \text{sales}$, $x_1 = \text{advertising}$, $x_2 = \text{price}$ and $x_3 = \text{distribution}$ and

$$y = x_1^{b_1} x_2^{b_2} x_3^{b_3}$$

then b_1 , b_2 and b_3 are the elasticities of sales with respect to advertising, price and distribution because

$$e_1 = \frac{x_1}{y} \cdot \frac{dy}{dx_1} = b_1$$

therefore taking logarithms and finding coefficients automatically give the elasticities, viz:

$$\log y = b_1 \cdot \log (x_1) + b_2 \cdot \log (x_2) \text{ etc.}$$

When the overall relationship between advertising and sales is thought not to be a straight line one, elasticity is still defined in the same way but taken as being of a different magnitude at different parts of the curve. In effect, the curve is thought of as being made up of lots of successive short, straight lines.

The elasticity of demand with respect to price is similarly defined with change-in-price replacing change-in-advertising in the equation.

Monopoly

This is the opposite of perfect competition; where there is single control over the supply of a commodity or service and that control can be maintained.

Oligopoly

This is the situation in which there are only a few producers of an item or service. The product produced may be more or less identical, in which case the oligopoly would be called perfect.

Marginal revenues and costs

Marginal revenue is the extra revenue obtained by selling one more unit of the item or service; marginal cost is the addition to total cost involved in producing one extra unit of output.

When marginal cost is greater than marginal revenue a firm will no longer be making a profit. Thus, it is assumed, a firm will produce and sell goods or services up to the point when its marginal revenue equals its marginal costs.

Advertising :

Is not usually precisely defined by economists but by inference could often be synonymous with all discretionary, promotional expenditure. It is seen as a separate expenditure which does not directly increase the cost of the goods or services being offered.

Appendix D

Simon's Method

The method requires that a 'retention rate' be estimated. This parameter is akin to the Vidale and Wolfe decay constant in that it is used to assess the level of sales if no advertising were undertaken in a period. Simon advocates that it is estimated either from observation of past data, experiments or "at worst, the firm may use its judgement in deciding the retention rate". Also, the effect on sales of several different levels of advertising in a period must be estimated; although this is the crux of the problem and Simon advocates various statistical methods, it is possible that the sort of small company for whom the overall method is appropriate can probably rely on past experiences to supply these estimates.

- Step 1. Multiply the last period's sales by the retention rate: this estimates the sales in the current period if no advertising is to be undertaken;
- Step 2. Estimate the sales volumes that would occur in the current period for various levels of advertising the company wishes to consider;
- Step 3. Subtract the result of Step 1 from each of the values in Step 2 and subtract the cost of producing the total sales levels. This provides an estimate of the net revenue for the different levels of advertising for the current period;
- Step 4. Multiply the retention rate by the results of Step 3. This estimates the net revenue caused in the succeeding period by advertising in the current period. This step can be repeated again and again so as to consider the total time span over which the advertising is expected to exert an effect;

- Step 5. Multiply each period's result in 4 above by the discount rate for money;
- Step 6. Add the results for all the periods considered and subtract the cost of advertising. This yields the present value of an advertising outlay in the current period;
- Step 7. Compare the present values of each advertising level proposed and pick the one giving the highest figure.

Appendix E

An Extension of Decision Theory for Advertising
Budget Setting

In the section on Decision Theory/Bayesian Methods, an example was cited of a product A, for which management believed it had a likelihood of 0.3 (30% chance) of achieving a 10% market share, a likelihood of 0.4 for a 20% share and a likelihood of 0.3 for a 30% share.

In the table below it is indicated that if advertising support is given to product A when it was likely to achieve a 10% market share, it is almost certain to achieve that share, and equally likely to achieve the other possible share levels. The table indicates management's confidence in the ability of advertising to help in particular circumstances.

Actual Product State		Confidence in Advertising's effect at		
(% market share)		10%	20%	30%
		b_1	b_2	b_3
a_1	10	<u>0.9</u>	0.05	0.05
a_2	20	0.05	<u>0.90</u>	0.05
a_3	30	0.05	0.05	<u>0.90</u>

Using this modifying information it is possible to use Bayes' theorem to revise the expected outcomes for the market share achievements in accordance with the estimated reliability of advertising to help. Hence the chance that a 10% market share is actually achieved with advertising support is 0.3×0.9 ie. 0.27; if a 10% share was existing and was then supported by advertising the chance that this results in a 20% market share is 0.3×0.05 ie. 0.015, and so on for all possibilities to produce the table below:

	<u>b_1</u>	<u>b_2</u>	<u>b_3</u>
<u>a_1</u>	0.270	0.015	0.015
<u>a_2</u>	0.020	0.360	0.020
<u>a_3</u>	<u>0.015</u>	<u>0.015</u>	<u>0.270</u>
	<u>0.305</u>	<u>0.390</u>	<u>0.305</u>

Hence the overall 'marginal' probability of achieving a 10% share is 0.305. To calculate the individual probability of each state represented in the matrix, it is necessary to divide the individual cell values by these 'marginal' probabilities ie. $a_1b_1 = 0.270/0.305 = 0.88$, $a_1b_2 = 0.015/0.390 = 0.04$, etc. The revised chance of achieving each state, depending on the starting state (market share being supported), is shown in the table below:

	<u>b_1</u>	<u>b_2</u>	<u>b_3</u>
<u>a_1</u>	0.88	0.04	0.05
<u>a_2</u>	0.07	0.92	0.07
<u>a_3</u>	0.05	0.04	0.88

Using these revised probabilities, which include estimates of the likelihood of advertising achieving its required objective, it is possible to calculate a new value for the expected value of support. The method is the same as that outlined before but there are now **more** alternative ways that each share might be achieved and this is set out in the diagram below for product A:

<u>Expected Outcome</u>	<u>Expected Value</u> (£'000)	<u>Chance</u>	<u>£ pay-off</u>
<u>Do not support</u>			
£177.5 ←	177.5	.3	-75
		.4	200
		.3	400
	<u>Marginal probabilities</u>		
	0.305 x -32 ←	.88	-75
		.07	200
		.05	400
<u>Support</u>			
£187.3		.04	-75
	0.390 x 197	.92	200
		.04	400
	0.305 x 362.25	.05	75
		.07	200
		.88	400

Hence in this example the overall expected outcome if advertising support is given is £187,300 whereas without support it would be £177,500. Therefore the amount of advertising support worth considering is $£187.3 - £177.5 = 9.8 (£000)$. This sum is considerably less than the £22,500 suggested by the simpler, previous analysis which assumed the outcome of advertising support was definite rather than probabilistic.

The analysis presented in this Appendix is adapted from Elliot and Christopher (1974) 1978, who use Bayesian methods to determine the cost effectiveness of information for market research purposes.

Appendix F. A/S ratios and Own label market shares

A/S Ratio and Own Brands' Market Share

<u>A/S (%)</u>	1973			3 years ago		
50 & over	1					
20.1 - 50	3			2		
10.1 - 20	3			2		
5.1 - 10	1	2	4	2	4	1
1.1 - 5	1	7		1	5	2
0 - 1	1	2		1		
	0	10.1	above	0	10.1	above
	-10	-30	30	-10	-30	30
	Share held by own labels (%)			Share held by own labels (%)		

The above tables show the a/s ratios for the 25 products which have own label products in their markets and the share of market held by these own label products. The cell entries signify the number of products in each category. The Chi-square test of significance shows that for 1973 there appears to be a highly significant association between a/s and share of market held by own labels, i.e. the higher the a/s ratio the lower the market share held by own labels. This relationship is not apparent for a smaller set of data for three years previous. It is emphasised that many other factors may contribute to this apparent relationship and it may be a characteristic of the particular sample.

Appendix G. Data collected on each product/service

Items upon which data has been collected for each product, or service, being studied by the MCRC from within sponsor companies:

1. Number of competing brands/products.
2. How competitive is the market?
3. The proportion of the market held by own label products - now and three years previous.
4. The quality of own label products compared with the product/brand?
5. The price difference between own labels and the product/brand.
6. The average price of the product/brand.
7. Ratio of above/below the line expenditure - now and three years previous.
8. The rate of growth or decline of the market -now and three years previous.
9. The product category into which the product/brand falls (e.g.new, well established, declining).
10. The product's quality compared with its advertised competitors.
11. The level of distribution.
12. The degree of seasonality of sales.
13. The average frequency of purchase of the product/brand.
14. The degree of brand loyalty to the product/brand.
15. The a/s ratio- now and three years previous.
16. The minimum expenditure thought necessary to advertise the product/brand on T.V. - now and three years previous.
17. The effect of reduced expenditure on pattern of media.
18. An assessment of how advertising works in the market.
19. The market size.
20. Product sales (£).
21. Product advertising (£).
22. Below-the-line promotion (£).
23. Total market advertising (£).

REFERENCES

- 28 COLLEY Russel H.
"Defining Advertising Goals for Measured Advertising Results" 1961
New York: Assoc. of National Advertisers
- 30 REEVES R.
"Reality in Advertising" New York: Alfred A.Knopf.1961
- 72 BARNETT Terry & LOUGHER Jill
"'Multiplus' -A Model for Television Planning and Evaluation"
Admap January 1971 pp.20-25
- 145 McDONALD Colin
"What is the Short-Term Effect of Advertising?"
ESOMAR Congress Barcelona 1970 pp.463-485
See also ADMAP November 1970 pp.30-356,366
- 308 LITTLE J.D.C.
"A Model of Adaptive Control of Promotional Spending"
Operations Research Nov.-Dec.1966 p.1075 23 pages
- 325 TULL Donald S.
"The Carry-Over Effect of Advertising"
Journal of Marketing April 1965 p.46 8 pages
- 461 TREASURE J.
"How Much Should You Spend on Advertising?"
Advertising Quarterly Summer 1971 p.11 4 pages
- 476 PELES Y.
"Amortization of Advertising Expenditures"
Journal of Accounting Research Spring 1970 p.128 9 pages
- 546 FITZROY P.T.
"An Adaptive Model for Promotional Decision Making"
Philadelphia, Marketing Science Institute Special Report
April 1967
- 557 McNIVEN M.A.
"How Much to Spend for Advertising" New York
Association of National Advertisers 1969
- 559 MURRAY J.A.
"Utilizing Consumer Expectational Data to Allocate Promotional Effort"
Journal of Marketing Vol.33 No.2 April 1969 pp.26-33
- 620 CHARNES A. & Others
"Goal Programming Model for Media Planning"
Management Science Vol.14 No.8 April 1968 pp.B423-B430

- 680 VIDALE Marcello; VOSS John & WOLFE Harry
 "Measuring Advertising Effectiveness"
 Arthur D. Little Inc., Cambridge, Mass. also
Operations Research Vol.5, No.3, July 1957
- 739 JOYCE Dr. Timothy
 "What Do We Know About How Advertising Works?"
ESOMAR Seminar Paper Noordwijk ann Zee 1967
 also Published by JWT, London. Booklet 25 1968
 and by Advertising Age
- 769 ADAMS James R.
 "What is the Media Problem?" Admap April 1971 pp.112-.20
- 806 BECKNELL James C.Jr. & McISAAC Robert W.
 "Test Marketing Cookware Coated With 'Teflon'"
Journal of Advertising Research Vol.3 No.3 Sept.1963 pp.2-8
- 864 FORRESTER Jay W.
 "Advertising: A Problem in Industrial Dynamics"
Harvard Business Review March-April 1959 pp.100-110
- 882 SASIENI Maurice W.
 "Optimal Advertising Expenditure"
Management Science Vol.18 No.4 Pt.II Dec.1971(U.S.A.)
- 883 MONTGOMERY David B. & SILK Alvin J.
 "Estimating Dynamic Effects of Market Communications Expendi-
 tures"
Management Science Vol.18 No.10 June 1972 (Printed U.S.A.)
- 886 LAVINGTON Michael R.
 "A Practical Microsimulation Model for Consumer Marketing"
Operational Research Quarterly Vol. 21 No.1 March 1970 pp.25-45
- 912 SCHULTZ Randall L.
 "Methods for Handling Competition in Dynamic Market Models"
 Paper presented at the 4th National Meeting of the American
 Institute for Decision Sciences New Orleans Louisiana
 Nov.1-4 1972 Published (in summary) in the Proceedings of the
 conference.
- 914 GREEN P.E.
 "Bayesian Decision Theory in Advertising"
Journal of Advertising Research December 1962
- 980 NERLOVE M. & ARROW K.J.
 "Optimal Advertising Policy Under Dynamic Conditions"
Economica May 1962 pp.129-142
- 1001 RAO A.G.
 "Towards a Quantitative Theory of Advertising"
 Ph.D. dissertation University of Pennsylvania 1967
- 1007 SIMON J.
 "The Management of Advertising" Prentice Hall 1971

- 1008 MONTGOMERY D.B. & URBAN G.L.
 "Management Science in Marketing" Prentice Hall 1969
- 1021 AMSTUTZ A.
 "Computer Simulation and Competitive Market Response"
M.I.T. Press 1967
- 1040 DEAN Joel
 "Does Advertising Belong in the Capital Budget?"
Journal of Marketing October 1966 Vol.30 No.4.
- 1042 COMANOR William S. & WILSON Thomas A.
 "Advertising, Market Structure and Performance"
The Review of Economics and Statistics Vol.XLIX No.4 Nov.1967
- 1103 TAPLIN Walter
 "Advertising a New Approach"
 Advertising a New Approach Second Ed. (Boston:Little,
 Brown and Company, 1963) pp.114-115
 1108 at end
- 1109 TELSER L.G.
 "Advertising and Competition"
Journal of Political Economy 72 December 1964
- 1111 ELSE P.K.
 "The Incidence of Advertising in Manufacturing Industries"
Oxford Economic Papers Vol.18 No.1 March 1966
- 1112 SIMON J.L.
 "A Simple Model for Setting Advertising Appropriations"
Journal of Marketing Research August 1965
- 1113 TAPLIN W.
 "Advertising Appropriation Policy" Economica 1959
- 1125 KUEHN A.A.
 "How Advertising Performance depends on other Marketing Factors"
Journal of Advertising Research Vol. 2 March 1962
- 1139 TELSER L.G.
 "Advertising and Cigarettes"
Journal of Political Economy October 1962 70 pp.471-99
- 1149 BOGART Leo
 "Strategy in Advertising" New York:Harcourt, Brace & World
 1967
- 1199 DOYLE P.
 "The Economic Aspects of Advertising"
The Economic Journal September 1968
- 1500 KOTLER P.
Marketing Management Second Edition Prentice Hall 1972
- 1539 EHRENBERG A.S.C.
 "An Appraisal of Markov Brand Switching Models"
Journal of Marketing Research Vol.2 November 1965 p.347-362

- 1594 TSURUMI H.
 "A Comparison of Alternative Optimal Models of Advertising
 Expenditures: Stock Adjustment vs. Control Theoretic Approaches"
Review of Economics & Statistics, May 1973 pp.156-168
- 1598 at end
- 1599 PALMER J. & SAMPSON P.
 "Setting Advertising Appropriations: A Science for Imitating
 Consumer Behaviour"
The Thomson Medals for Advertising Research 1972, Gold Medal
 Paper
- 1601 DORFMAN R. & STEINER G.
 "Optimal Advertising and Optimal Quality"
American Economic Review Vol.44 No.5, Dec.1953.
- 1602 SCHMALENSEE R.
 "The Economics of Advertising" North Holland, 1972.
- 1695 COWLING K.
 "Optimality in Firms Advertising Policies: An Empirical
 Analysis"
Centre for Ind. & Bus. Research, Research Paper No.20,
 Warwick University, 1972.
- 1733 DEAN J.
 "Managerial Economics"
Prentice-Hall, 1951 New York
- 1744 JASTRAM R.
 "A Treatment of Distributed Lags in the Theory of Advertising
 Expenditure"
Journal of Marketing, July 1955
- 1746 KERNAN J.B. & McNEAL J.U.
 "The Closest Thing to Measuring Advertising Effectiveness"
Business Horizons, University of Indiana, Winter 1964.pp.73-80
- 1749 KOTLER P.
 "Marketing Decision Making: A Model Building Approach"
Holt, Rinehart and Winston, New York, 1971
- 1757 LITTLE J.D.C.
 "Models and Managers: The Concept of a Decision Calculus"
Management Science Vol.6, N 8, April 1970,pp.466-485
- 1770 RASMUSSEN A.
 "The Determination of Advertising Expenditure"
Journal of Marketing, Vol.16, April 1952 pp.439-446.
- 1794 WEINBERG R.S.
 "An Analytical Approach to Advertising Expenditure Strategy"
Association of National Advertisers Inc. New York, 1960.

- 1963 EHRENBURG, A. & GOODHARDT, G.
 "The Hendry Brand Switching Coefficient"
 Personal communication: to be published probably in
ADMAP (Autumn) 1974.
- 1964 CANTER, S & KERSHAW, A.
 "Marketing Implications of Media Expenditures"
 New York: A.N.A. (1971)
- 1965 PECKHAM, J.O.
 MAP: Markets Analysis and Planning.
 ESOMAR Congress Papers 1974
- 1966 ADAMS, J.R.
 Private Communication
- 1967 KUEHN, A.A.
 "A Model for Budgeting Advertising"
 in Bass et al - Math.Models and Methods in Marketing
 (see ref.1951) (1961)
- 1968 LEARNER, D.B.
 "DEMON: New Product Planning: a case history"
 in Webster, F.E. "New Directions in Marketing" AMA , 1965.
- 1969 WASCHLER, A.
 "NEWS"
 Speech to A.M.A. January 1970.
- 1970 HULKS, R.
 "Predicting Frequency and Coverage"with PREFACE"
 ESOMAR Congress Papers 1973.
- 1971 LIPSTEIN, B.
 "Modelling and New Product Birth"
Journal of Advertising Research October 1970.
- 1972 STANFORD UNIVERSITY
 "Maxim: a case study of a new product introduction"
 Stanford University 1964 - available via Cranfield.
- 1973 BRYANT, J.W.
 "A Simulation Model of Retailer Behaviour"
O.R.Quarterly (forthcoming)
- 1974 HEALD, G.I.
 "The Use of Attitude Data in the Short Term Forecasting
 of Durable Expenditure"
 ESOMAR Congress Papers 1970.
- 1975 ENIS, B.E.
 "Bayesian Approach to Advertising Budgets"
Journal of Advertising Research (Feb.) 1972
- 1976 AAKER, D.
 "An Advertising Decision Model"
 Thomson Medals and Awards 1972.

- 1950 LIND, H.
"Should Marketing Men Learn Economics?"
ADMAP April, 1974
- 1951 BASS, F.M. et al
"Mathematical Models and Methods in Marketing"
Homewood. Irwin (1961)
- 1952 BAUMOL, W.J.
"Business Behaviour, Value and Growth"
Macmillan (1959)
- 1953 ROTHMAN, L.J.
"When is a Difference Significant to Profits?"
MRS 16th Annual Conference March 1973.
- 1954 GOULD, J.P.
"Diffusion Processes and Optimal Advertising Policy"
In Phelps et al. 'Microeconomic Foundations of Employment
and Inflation.' New York Norton (1970)
- 1955 VERDORN, W.J.
"Business, Behaviour, Value and Growth"
Prentice Hall (1958)
- 1956 NELSON, P.
"Information and Consumer Behaviour"
J. Polit, Econ. March-April 1970
- 1957 JEFKINS, F.
"Advertising Made Simple"
W.H.Allen 1973
- 1958 JOHNSTON, J.
"Econometric Methods"
McGraw Hill (1963)
- 1959 MEDIA DECISIONS
"Can the Computer Set Your Ad.Budget?"
Media Decisions August 1972.
- 1960 BUTLER, THOMPSTON & COOK
"Quantitative Relationships Among Advertising Expenditures,
Share of Market and Profits"
in 'How Much to Spend on Advertising' Ed.McNiven (1969)
see ref.557
- 1961 BUTLER, D.H. & BUTLER, B.F.
"Hendrodynamics" (Chapts. 1 & 2)
Croton-on-Hudson. The Hendry Corp. (1971)
- 1962 EHRENBURG, A.S.C.
"Criticisms of the Hendry Advertising Equation"
19th Annual Conference of the ARF (Nov.) 1973

- 1977 SASIENI, YASPIN & FRIEDMAN
Operations Research Wiley 1959.
- 1978 ELLIOT, K & CHRISTOPHER M.
 "Research Methods in Marketing"
 Holt, Rinehart & Winston 1973.
- 1979 GERHOLD, P.E.J.
 "Measuring Results: the almost Impossible Dream"
 Address to the AAAA, White Sulphur Springs, April 1969.
- 1980 COVER, J.M. et al.
 "Department Store Sales and Business"
Journal of Business July 1931.
- 1981 WAGNER, L.C.
 "Advertising and the Business Cycle"
Journal of Marketing October 1941.
- 1982 JASTRAM, R.W.
 "Advertising Ratios Planned by Large Scale Advertisers"
Journal of Marketing July 1949.
- 1983 BULLEN, H.J.
 "1961 - Industrial Advertising Budgets"
Industrial Marketing January 1961.
- 1984 WRIGHT, WARNER & WINTER
 "Advertising"
 McGraw-Hill (1971) 3rd. Ed.
- 1985 PECKHAM, J.O.
 "Can We Relate Advertising Dollars to Market Share Objectives?"
 12th. Annual Conference ARF (Oct.) 1966
 (Reprinted in McNiven (1969) see ref.557.
- 1986 DOYLE, P.
 "Advertising Expenditure and Consumer Demand"
Oxford Economic Papers (Nov.) 1968.
- 1108 TELSER L.G.
 "How much does it pay whom to advertise?"
American Economic Review 51 May 1961
- 1598 ADAMS, J.R.
 "A New Look At The Determination of Levels of Advertising
 Expenditure"
European Research, September 1973, pp. 215-216,220.