

# Research Into Management Attitudes and Behaviour

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The study which I am about to describe is concerned with marketing. The object of the project has been to investigate strategies for growth and survival in the radically altered conditions in which much of Irish industry will shortly be operating, and my use of the word marketing to describe total business strategy in such conditions may not win automatic and unanimous approval. There are reasons for this usage which I am prepared to argue, but I fear that I might be misusing this Society's time if I were to engage in that argument here. Perhaps for the present purposes you will allow this word to connote the total relationship of the firm with the environment, and in particular the purposive adaptation of the firm as an organism to the environment. Some of the reasons for this usage should emerge in the course of the paper.

The idea of adaptation is one we have lived with a little bit too long, and as with all verbal or mental clichés there is the risk that a serviceable concept may be drained of all emotion or intellectual vitality. I want to inject a little adrenalin into the idea this evening by asking whether the kind of adaptive activity we have engaged in these past few years is fitted to the environment to come, which we have hardly begun to experience, and by questioning whether the structure which free trade is likely to impose upon industry has been grasped either by those responsible for the political and economic decisions, by the public which has by and large accepted the need for such decisions, or by the owners and managers who face the resulting problems and must resolve them. The theme of public utterances has been the need for Irish industry to become more competitive. The structure and administration of the industrial grants scheme have laid emphasis on re-equipment and modernisation, and on the usage of consultants to improve methods of work and of control, productivity – the drive to improve the ratio between human and material input and measurable output – has been the catchword and the assumed panacea.

Perhaps the findings of the C I O enquiries that there were on the whole good and bad elements in every industry encouraged a belief that the less-good elements had only to be brought up to the level of the better in order to be viable in free trade. Certainly the indiscriminating application of adaptation grants would appear to be implicitly based on the assumption that the existing structure of Irish industry can be maintained in free trade. I would suggest, on the contrary, that this is neither possible nor (for anybody who subscribes to the general notion of free trade) desirable, and that the effect of free trade will be to bring about a radical reshaping of manufacturing and distributive activity in Ireland.

Problems of operational efficiency are obviously important, but they are subsidiary to the essential strategic questions of where the firm stands in relation to the environment, what product-mix it will produce, and what markets it will sell in. These problems arise in an acute form simply because

the framework within which Irish firms operate is changing. And while accelerating rates of change in markets and products are a familiar and general feature of developed countries, due to widening discretionary spending power and rapid technological development, they are compounded in Ireland by the sudden transition now taking place in the context within which firms operate. The intimidating task of many top managers has become to identify and forecast demand, perhaps for products other than those they are used to, in markets where they have played little or no active part, and which differ in scale, structure and culture from the one they know.

In this situation the aggregates which are the stuff of much economic measurement and comment are of limited practical help. Each firm is a compound of its own historical development, of the unique sets of skills and resources available to it, and of the objectives and personalities of its owners, managers and workpeople. These are the elements which combine with an awareness of market pressures and market opportunities to determine the business that the firm will be in over the next few years, and it is uniquely the responsibility of the managing director or chief executive to achieve this combination in a successful way. And since it is my own view that the attitudes and behaviour of the chief executive have a profound effect upon the ethos and objectives of the people who make up an organisation, and since he is the person most exposed to the environment and most likely to be judged by the success or failure of the company, the research project focussed primarily upon that individual. Among the purposes set out at the commencement of the project in the autumn of 1967 were

- 1 to explore the views of chief executives in Ireland on the function of the enterprise in relation to the environment, and on the function of marketing in relation to the job of the chief executive himself,
- 2 to gather information on marketing and other defensive or expansionary behaviour initiated or encouraged by the chief executives, particularly related to free trade developments,
- 3 to assess the attitudes of chief executives to the processes of change, innovation and growth, both within the undertaking and in the environment.

At the same time an attempt was made to learn something about the views and attitudes of other senior managers by distributing to them, as well as to the chief executives interviewed, the Management Opinion Survey questionnaire appended to this paper. Since this questionnaire forms the basis of much that I shall have to say this evening, a few words about its provenance may be appropriate. The statements in it were intended to elicit responses on such matters as

- change, innovation and growth
- planning and profitability
- free trade and adaptation
- products and product policies
- advertising, distribution and consumers
- Government's role in industry

The nature of the questions were suggested by various reading, discussions with colleagues and friends, and some degree of introspection. The section on personal flexibility at the end (Questions 49-57) was taken from some similar research being undertaken at the University of Aston, subsequently transferred to the London School of Business. The wording was designed to make the statements as unambiguous as possible, without suggesting what the expected answers should be. In fact, there were no expected or "right" answers, and it was left to the impersonal technique of correlation analysis to associate groups of statements with each other at the analysis stage. As will be seen later, the questionnaire apparently succeeded in its aims of evoking interest and co-operation, and of furnishing a matrix from which some interesting underlying factors can be deduced.

### THE METHODOLOGY

First of all, a sample of firms was chosen with the help of the T C D Register of Undertakings, supplemented by information from Mr Tomlin of the I M I. The basis of selection was primarily size: all those employing 400 or more were selected, and of firms employing 100-400 firms were chosen mainly at random, a few purposively within various industry categories, in such a way as to yield representative sub-groups of firms in the following industries:

Extractive and energy	Chemicals and toiletries
Meat	Non-metallic Mineral Products
Fruit and Vegetables	Metals
Chocolate and Confectionery	Metal Products—Industrial
Brewing and Distilling	Metal Products—Consumer
Tobacco	Distribution
Textiles and Clothing	Finance
Footwear	Transport and Tourism
Paper Products	Printing

In practice, not all firms selected were interviewed because time did not permit it. Some of the 190 firms originally selected were never approached formally, and in a few cases difficulties in arranging appointments with the chief executives caused me to omit them. But it is noteworthy that the rate of refusal was negligible: only two firms refused outright, and a total of 170 chief executives gave interviews which were notable for their frankness and cordiality. I should like to record my enormous debt to those busy individuals who gave me on average something like one-and-a-half hours of their time and who spoke with unexampled candour about their companies' performance, their problems and their solutions, their objectives and their plans.

The resulting sample (some details of which are contained in Appendix I) was not a strict probability one, but it would tend to approximate one, and in so far as transportable goods industries are concerned, it had much in common with Mr Tomlin's meticulously chosen sample for his study.

“The Management of Irish Industry” in 1964. But unlike Mr Tomlin, I was not so much concerned to quantify the resulting data as to evaluate it qualitatively, and accordingly I felt free to employ to a small extent the kind of purposive selection that is commonly and successfully used in industrial marketing research.

Each interview followed on the whole a basic pattern, but considerable flexibility was allowed in the coverage of specific areas. As far as possible, my aim was to get the chief executive to talk freely and discursively about the following areas:

*Basic undertaking data* – ownership, size, products

*Competitive situation* – market share, free trade consequences, export activities

*Innovation* – policies on new and existing products, research and development, diversification and rationalisation

*The Market* – consumers, advertising, branding, distribution

*Planning* – length of planning and forecasting

*Marketing* – view of marketing

Not all interviews covered all points, and naturally enough the emphasis in each interview tended to vary. Nevertheless, some of my later analyses indicate that most of the major areas of concern were adequately covered.

At the end of each interview I produced and explained the Management Opinion Survey questionnaire which is reproduced in Appendix II. Occasionally it was completed on the spot but in most cases it was left to be returned later by post. At the same time I obtained the names of other senior executives in the organisation to whom I might send the questionnaire – sometimes the chief executive undertook to distribute these himself, but usually I wrote a covering letter to each individual mentioning that his managing director had already co-operated in the survey. The return rate from both managing directors and other executives was over 85%. One, and in some cases two, follow-up letters were used to achieve this result. In view of the length of the questionnaire and the personal nature of some of the questions on it, this rate of return must be accounted extremely good. The characteristics of the sample of 591 obtained in this way are described in Appendix III. Once again, I record my appreciation of the great co-operation given by the respondents.

The overall results registered in the 591 completed Management Opinion Survey questionnaires, in terms of the percentages agreeing or disagreeing with each statement, are shown in Appendix IV. The individual results have been submitted to principal component analysis with the object of identifying underlying common factors. Patterns of high and low scoring on each of the factors have then been analysed by various demographic and occupational characteristics so as to discern apparent associations and likely cause and effect relationships. A few words about the techniques involved are appropriate.

## PRINCIPAL COMPONENTS ANALYSIS

Factor analysis, of which principal components analysis is a commonly used variant, is a branch of statistical science developed primarily by psychologists to provide mathematical models explaining human abilities and behaviour. Although still identified largely with psychological studies, its applicability to a wide range of data in economics, sociology and the physical sciences has latterly been recognised, and in my view the use of factor analytic techniques is likely to broaden considerably over the next few years.

Its essential purpose is to simplify the relationships between a number of observed variables, on the principle of parsimony common to all scientific theory, by extracting a smaller set of hypothetical variables which explain most of the variance that occurs in the observed data. These hypothetical variables, or "factors", retain the essential characteristics of the original data and can be used to reproduce more or less exactly the original input. The first step in the analysis is to produce a correlation matrix – a square symmetrical matrix showing the coefficient of correlation of each variable with every other variable. The variance of a variable is the square of the standard deviation of the observations on the variable, and the variance of the matrix is the sum of the variances on each variable.

Since a total of 591 individuals completed questionnaires containing 57 questions, we have 591 observations on each of 57 variables. The responses in the form Strongly Agree/ Agree/ Undecided/ Disagree/ Strongly Disagree have been scored respectively plus 2/ plus 1/ nil/ minus 1/ minus 2, and responses in the form True/ ?/ False have been scored plus 1/ nil/ minus 1. Clearly the coefficients of correlation in the resulting matrix can be either positive or negative. Inspection of the matrix showed that a number of the correlations were disappointingly low, and as will be shown later some of the original variables were eliminated from later analyses as unlikely to contribute significantly to common factor variance.

At this point attention should be drawn to the fact that full factor analysis takes into account two components of variance – common factor variance and unique variance. The unique variance of a variable is made up of a specific factor peculiar to the variable and an error or unreliability factor. The common factor variance (i.e. the sum of the squares of the common factor coefficients) is called the communality of the variable, and in full factor analysis it is the practice to insert estimates of the communalities in the main diagonal of the correlation matrix in place of unity. The method of principal components eschews this subtlety, but for the purpose of group analyses of the kind required by this study it has been found that solutions arrived at by principal components do not differ noticeably from those reached by full factor analysis when the number of variables exceeds 20.

The next step in the principal components technique is to break down the correlation matrix into a set of orthogonal (uncorrelated) components equal in number to the original variables. The components, or factors, are extracted in descending order of magnitude, and the first few are usually

sufficient to account for a large proportion of the total variance, with later components contributing insignificant amounts. The coefficient of correlation of each variable with each factor is called a loading, and by examining which variables load highly on a factor it should be possible to deduce something about the nature of the factor. Variables which load highly on the same factor should also correlate reasonably well with each other.

Unfortunately the factor loading table derived in the way described does not usually lend itself to ready interpretation. It defines a unique set of dimensions or reference axes out of an infinitude of possible ones, and therefore various rotational techniques have been developed with the object of making the factors conform to "simple structure". This has the effect of maximising the coefficient of a variable on one axis and minimising it on all others. General factors are thereby eliminated and bipolar factors are highlighted. Note that this exercise does not affect the original observations, but only the dimensions along which they are interpreted. Opinions vary about the appropriateness of various possible methods of rotation. In the current study the Varimax rotation, yielding high loadings for each factor on a few variables, has been adopted since the emphasis is on cleaning up the factors rather than the variables.

It is as well to admit here that despite any appearance it may give of mathematical exactitude, the process of full factor analysis (unlike the principal components method) is to some extent arbitrary or indeterminate. Given the correlations of a set of variables, systems of orthogonal factors consistent with the observed correlations may be chosen in an infinitude of ways. A factor-analytic solution determines the  $m$ -dimensional space containing the common factors, but it does not determine the frame of reference or the exact position of these factors. Since the choice of reference frame or axes is vital for interpretation, factor analysis has been changed with undue subjectivity. But it is today generally conceded that indeterminacy of this kind is common to every field of scientific enquiry and that methods that yield satisfactory interpretations are worthwhile, even if they are not unique and final.

Returning to the question of rotation, it will be recalled that principal components extracts factors equal in number to the original variables, accounting for decreasing proportions of the total variance. The question arises how many of these to regard as significant and to subject to rotation. Guttman's lower bound theorem indicates that factors with latent roots less than 1.0 can be regarded as statistically insignificant, and this was adopted as the minimum criterion. As will be seen, this option in the present case yielded too many factors for satisfactory interpretation and other criteria were introduced, with the effect that the eventual number of significant and interpretable factors was reduced to seven.

A technique which assisted in this reduction, and also in the proper allocation of variables to factors, is cluster analysis. In this, the original correlation matrix is rearranged so as to bring together the variables which load highly on each factor. This should result in triangular groups containing relatively high correlations along the main diagonal. Inspection of the rearranged matrix enables one to re-assign or eliminate any variables

which, despite high factor loadings, have low correlations with other variables in the same group. The "Alpha" coefficient test or reliability (see Appendix V) was applied to each group, and variables were added to or eliminated from the group according as to whether they increased or decreased the reliability of the group as a test battery.

Finally, when factors have been satisfactorily identified with groups of variables it is possible to return to the original observations and score respondents on each factor according to their responses on the original variables. Techniques are available for computing these scores (known as "factor scores") according to the multiple regression weight of every variable on the particular factor, but in the present study a more simple approach was taken. When with the help of cluster analysis and alpha coefficients the variables contributing significantly to each factor had been identified, equal weight was allowed to each relevant variable. An individual's score on each factor was then computed by summing his responses on the appropriate variables (ranging from plus 2 Strongly Agree to minus 2 Strongly Disagree) with a change of sign where the relationship was a negative one.

#### *The Identification of Factors*

The first tabulations of the survey data yielded a mixture of disappointment and encouragement. When all 57 variables were included it was found that no less than 20 factors had latent roots greater than 1.0, and these accounted for no more than 57% of the total variance – a very low figure for so many factors. On the other hand, when the first ten of these factors were rotated and the loadings examined it was clear that they possessed on the whole clear and very interesting meanings. However, since the statistical basis of this first attempt was very weak I shall not linger on it.

Nor shall I try your patience with an account of the many tedious steps and frequent retabulations by which I endeavoured to reduce the number of significant factors to an interpretable span and to increase their statistically explanatory power. Basically what I did was to eliminate gradually from the matrix those variables which had low correlations with other variables and which could contribute little to any of the common factors. I then instructed the computer to extract and rotate varying numbers of factors, from thirteen to four, and examined each set of results for its interpretability and reliability.

The "best" results emerged from a run which excluded 17 of the original variables (Nos 3, 11, 18, 19, 30, 21, 25, 27, 30, 32, 33, 38, 46, 48, 49, 54, and 55) and rotated eight factors, all with latent roots exceeding 1.2. These factors accounted for 41% of the total variance, but the eighth factor was unduly low on the alpha test and difficult to interpret. On the other hand, two of the remaining seven, accounting together for 9% of the variance, had consistently turned up on every single tabulation, and one last run was therefore made excluding the variables relevant to these factors (Nos 16, 31, 41, 50, 51, 52, 53, 56 and 57) and totalling only five factors. The resulting five factors accounted for 35% of the variance of

the now much-reduced correlation matrix, and were very clearly the same as the five which together with the consistent two made up the interpretable seven in the earlier tabulation

The cluster analyses relating to each of the seven factors and the loadings of the variables on the factors are shown in Appendix VI, together with the alpha coefficient of each cluster and the percent of variance accounted for by each factor. In Appendix VII, the statements (i.e. the variables) contributing to each factor are spelt out in terms of agreement or disagreement, and on the basis of these patterns I take leave to name the factors as follows

Factor 1 Change- and Market-Orientation

Factor 2 Confidence *vis-a-vis* Free Trade based on Operational Efficiency

Factor 3 Disquiet about Government Policies, Incentives and Adaptation

Factor 4 Liking for Risk and Uncertainty

Factor 5 Flexibility in Sales Policy

Factor 6 Company Confidence

Factor 7 Product Orientation

#### ANALYSING THE FACTOR SCORES

Each of the 591 respondents was scored on each of the seven factors in the way described earlier. Average scores on each factor are shown in Appendix V. Respondents were then divided into approximately equal quartiles, from high to low scoring, on each of the factors, and each quartile was analysed in the following demographic and occupational terms

Age Group	Industry Group
Father's Occupation	Type of Ownership
Age Leaving Full-time Education	Directors/Non-Directors
Qualifications	Management Function

Some other classifications are possible from the data available and will in due course be tested, but these are the only categories analysed at this date, and they are probably the salient ones. The results are best set out in tabular form, as is done in Appendix VIII. I recommend this set of tables to your careful attention, for they are highly suggestive and stimulate a variety of interesting conclusions. I shall draw your attention to a few that occur to me, with the cautionary reminder that conclusions of this kind relate to the tendency of aggregates and do not necessarily apply to any one individual possessing the characteristics examined. Note in particular the word "tendency", and bear in mind that all the measurements are relative ones within the sample studied: they are not absolutes, despite the apparent precision resulting from giving the factors names.

#### *By Industry Group*

1 The drink and tobacco industries share a consistent pattern of strong



- marketing orientation and flexibility in sales policy, negative product orientation, clearcut self-confidence, and no reliance on government or other outside agencies
- 2 The paper products and printing sector is almost the converse of the drink and tobacco industries, being low on market-orientation, sales flexibility, and self-confidence, and high on product orientation
  - 3 Transport and tourism scores high on market orientation, low on product orientation, and appears to be armed to some extent against the uncertainties it feels towards free trade by its own willingness to face risk and uncertainty
  - 4 The textiles and clothing industries tend towards product-orientation, with a belief in their own operational efficiency in free trade, at the same time they show some lack of confidence both in themselves and in government and adaptation measures
  - 5 The metals and engineering sector shares the tendency of the textiles and clothing sector towards product orientation and a lack of confidence in government and adaptation measures, compounding this with apparent doubts about its own viability in free trade
  - 6 The extractive and energy group combines confidence in its own management ability with some apprehension about the consequences of free trade, despite satisfaction with government measures in this context

*By Company Ownership*

- 7 Managers in private companies in general tend not to like risk and uncertainty, while those in state companies do
- 8 Foreign-controlled companies, both private and public, tend to be market-orientated, flexible in sales policy, confident of their own management ability, and non-product-orientated
- 9 Public companies other than foreign controlled ones tend to be product-oriented and non-marketing-oriented
- 10 Companies other than foreign-controlled ones tend as a whole to lack full confidence in their own management ability
- 11 State-owned companies resemble foreign-controlled ones in their marketing-/non-product-orientations and flexibility in sales policies, but show more unease about their own management and the consequences of free trade

*By Management Function*

- 12 Sales and marketing management share clear tendencies towards marketing-/non-product-orientations, flexibility in sales policies, and the ability to live with risk and uncertainty. On the other hand, sales managers are markedly more confident about their companies' management abilities and the consequences of free trade than are marketing managers
- 13 General management tends to score low in market-orientation and in liking for risk, but high in company confidence
- 14 Company secretaries, accountants and production/engineering

managers have remarkably similar profiles with low marketing- and high product-orientations, low liking for risk and uncertainty, general inflexibility on sales matters, and some uncertainty about the future

- 15 Directors other than chief executives contrast interestingly with them in scoring high (where chief executives score low) in market-orientation, confidence *vis-a-vis* free trade, and disquiet about government and adaptation measures
- 16 Non-director managers tend on the whole to be product- and non-marketing-oriented, low in company confidence and sales flexibility, yet high in risk-ability.

*By Age*

- 17 A clear break occurs on every factor except one (Company Confidence) between those aged under 45 and those over 50 The younger age group tends to score high on market-orientation, sales flexibility, risk-taking, and disquiet about government and adaptation measures, and low on product-orientation and confidence *vis-a-vis* free trade The older group tends to score exactly the converse

*By Father's Occupation*

- 18 I am not sure that this analysis yields significant independent patterns Those that emerge may be more the result of education and qualifications or other factors than directly of parental occupation I shall not linger on this analysis at this time

*By Education and Qualifications*

- 19 As with age characteristics, there is a clear break between those who leave school before 18 and those who continue full-time education beyond 20 the latter are high in market-orientation and liking for risk, and low in confidence *vis-a-vis* free trade The latter are precisely the converse
- 20 As one would expect, this self-same difference is apparent between those with qualifications of one kind or another and those with none In addition, the qualified group tends to score high on sales flexibility and low on disquiet about government and adaptation measures, and the unqualified group the converse
- 21 Among those with qualifications it is interesting to note that those with only university qualifications show a pattern almost exactly opposite to those with professional qualifications only the former tend towards high marketing- and low product-orientations, flexibility in sales matters and a liking for risk and uncertainty, combined with relative uncertainty about their own companies' management abilities and disquiet about free trade and its consequences Those with only professional qualifications show patterns the exact reverse of these
- 22 Among managers with university qualifications those with Arts and Commerce degrees tend to score high on market-orientation, and those with Science and Engineering qualifications low

- 23 Those with Arts degrees conform closely with those with Science degrees in scoring high on risk-taking and sales flexibility, and low on company confidence
- 24 Among managers with professional qualifications those with marketing qualifications tend to be (not surprisingly) market-oriented, while all others tend towards product-orientation. Marketing-qualified managers are also high on risk-ability
- 25 Those with professional financial/secretarial qualifications tend to be high on company confidence, and at the same time uneasy about government and adaptation measures
- 26 Those with professional engineering or science qualifications show a marked pattern of unease about free trade and its consequences, government and adaptation measures, and the abilities of their own company management

Many of these patterns conform generally to what one would expect, but I believe there is some value in spelling them out on the basis of factual research. Naturally the existence of statistical associations gives no proof of the origin or direction of cause-effect relationships, but I believe further inter-analysis of the data supplemented by other information should yield some diagnostic indications before the project is completed.

#### **BEHAVIOUR RELATED TO ATTITUDES**

Up to this point I have concentrated upon an aspect of the total project which I imagine to be of particular interest to this Society. But you would leave with a very incomplete idea of the exercise if I did not at least refer briefly to the complementary and in some ways more important part which deals with the behaviour and strategy of firms as revealed in interview. These two parts will be integrated and commented on in the final thesis, but that stage has not yet been reached.

Since I have written about behaviour and strategy elsewhere (in a paper to a CIOS congress in France last November and in an article appearing in today's issue of the I M I's journal *Management*) I shall not tax you with detail here, but a summary of some salient points will serve to put the attitude study in its context.

Perhaps the most significant finding is that there exists a marked discrepancy between views and opinions expressed by managers at the general level and actual behaviour at the firm level. Thus, there is fairly general acceptance of the propositions that radical structural changes are in the offing and that a number of companies in a variety of industries are likely to go out of business, that some drop in manufacturing employment and a shift in the emphasis of some companies towards distribution are inevitable, that substantial parts of some home markets will be lost to foreign competition, and that in some product areas dumped or marginally priced goods from foreign countries will create acute pressures. At the same time chief executives in interview tended to evince confidence in the ability of their own firms to survive in much the same shape as at present, and to

expect the radical changes mainly to affect other people – their customers, perhaps, or their suppliers, or their competitors, or the economy at large. For themselves, the general mood was one of optimism and self-confidence.

The interviews sought to trace some grounding of this optimism in the strategic planning and behaviour of the firms, and found disconcertingly little. A few firms had taken positive steps towards specialisation in manufacture and variety reduction, and a number of others were thinking about such steps, a few firms were able to instance diversification activities, and others had plans of varying precision to do something like this. Interestingly, specialisation and variety reduction tended to be the strategy of foreign-controlled firms, and diversification that of locally-controlled ones. Most significant of all was the fact of an already high degree of participation in Irish industry by foreign firms (almost two-out-of-five of the sample was either controlled by a foreign firm or closely associated with one by way of shareholding or trading links), the fact that much of this participation was of recent origin, and the fact that frequent reference was made by firms without such associations to the possibility of resolving future difficulties by acquiring them.

There is room for a good deal of comment on these findings, but in this paper I shall restrict myself to two brief points. Firstly, I do not favour reliance on satellite feeder-plant operations as the basis of our participation in international business, and I believe it is vital for the health, security and financial vitality of Irish industry for some substantial part of it to establish a degree of independent control over the markets they serve – and that, in the future, means international markets. The cost, complexity, and difficulty of doing this cannot be underrated – and this brings me to my second (and last) point. Successful operation in international markets requires a blend of many functional skills and not least of its pre-requisites is operational efficiency. But the qualities which, in my view, we need most urgently at this time of adaptation for survival are the imagination, flexibility, insight and information to identify market segments that can be exploited by the kind of resources we deploy, the courage and persistence to exploit them, and the sensitiveness to change and the ability to plan ahead that will ensure further growth and profit. I believe that the dimensions revealed by my attitude study throw light on some of these qualities and on their possessors.

## APPENDIX I

## THE SAMPLE OF FIRMS

	Firms Interviewed	
	No	%
<i>By Industry</i>		
Extractive and Energy	6	4
Food	25	15
Drink and Tobacco	12	7
Textiles, Clothing, Footwear	34	20
Paper Products, Printing	18	11
Chemicals and Toiletries	13	8
Non-Metalliferous Mineral Products, Wood, Rubber	10	6
Metals and Engineering	32	19
Distribution and Finance	12	7
Transport and Tourism	8	5
	—	—
	170	100
<i>By Size</i>		
Under 200	27	16
200-299	35	21
300-499	36	21
500-749	20	12
750-999	18	11
Over 1,000	34	20
	—	—
	170	170
<i>By Firm Ownership</i>		
Co-operatives	3	2
Private Companies	65	38
Public Companies	90	53
State Companies	12	7
	—	—
	170	100

## APPENDIX II

## MANAGEMENT OPINION SURVEY QUESTIONNAIRE

This is a sample survey of management opinion being carried out as part of a major research programme by the Administrative Research Bureau of Trinity College, Dublin. It is important for the success of the project that all those approached for their opinions co-operate. We hope you will make room for the few minutes required to do so.

Below are given 48 statements which represent variously-held opinions on aspects of management or variously held attitudes to the job of management. They are chosen in such a way that most managers are likely to agree with some statements and disagree with others. After each statement you are requested to record your personal opinion by ringing one of the following:

SA if you strongly agree with the statement

A if you agree on the whole

U If you can't decide for or against, or if you think the question is worded in such a way that you can't give an answer

D if you disagree on the whole

SD if you strongly disagree

Please answer frankly and do not consult anybody else about the answers. Remember this is not a test, there are no "right" or "wrong" answers. The answer required is your own personal opinion.

The questionnaire is numbered for identification, but it will be handled anonymously and in confidence. The contents will be used purely for statistical analysis and no individuals will be identified with specific views. Likewise the few personal questions at the end are purely for analysis purposes and will not be related to individuals.

Please return when completed to: Management Opinion Survey,  
Administrative Research Bureau,  
Department of Business Studies,  
University of Dublin,  
Dublin 2

[EDITORIAL NOTE: Each statement 1 to 48 was followed by SA, A, U, D, SD.]

- 1 The movement towards free trade is a desirable one
- 2 The most serious long-term problems in my business today are problems of marketing
- 3 It is advisable to maintain a wide product-range in order to guard against failure in any one line
- 4 Basically a product's price is determined by the costs of manufacture and distribution
- 5 Market research is mainly helpful in planning advertising
- 6 Provided we succeed in selling a planned level of production we are not too concerned whether the total market for our product expands or contracts
- 7 A manager has continually to resist the tendency of things to change
- 8 Basically in business it is every man for himself

- 9 In our business we have to cater for consumers who don't really appreciate a quality product
- 10 For most business problems there is just one right answer once a person is able to get all the facts
- 11 Decisions once made have to be adhered to
- 12 Changes in government policies on finance, credit and taxation make planning in our industry impossible
- 13 Provided our industry gets its production facilities into efficient trim it will be able to face free trade with confidence
- 14 It is our job to create the need for our products as well as the products themselves
- 15 Results are what matter in business how you get them isn't important
- 16 My company has a pretty clear idea of where it is going over the next three or four years
- 17 Advertising is an expensive diversion of effort, forced on us by the actions of competitors
- 18 The sales forecast should be the basis of the production schedule
- 19 My job is a taxing one and keeps me pretty fully extended
- 20 In five years time our firm will be making/selling much the same things that it is now making/selling
- 21 Design is going to contribute a great deal to the success or failure of products in our business over the next few years
- 22 The government is not doing enough to create the conditions in which our industry can flourish in free trade
- 23 Some firms in our industry will almost certainly go out of business when free trade becomes effective
- 24 Any firm that does go out of business under free trade probably deserves to
- 25 The essential purpose of a business firm is to make money
- 26 It is inadvisable to experiment with distribution policies that can upset existing arrangements
- 27 Prices are determined primarily by what the market will bear
- 28 In our business we know the market well enough not to need any outside research
- 29 A good quality product will sell itself
- 30 Obtaining finance for new or expanded operations is not normally a major problem
- 31 Co-operation and communication between senior management in our company is good
- 32 Our company's advertising agent is practically part of our management team
- 33 Men who question and disturb accepted views and methods, even at the cost of harmonious personal relations, are valuable members of management
- 34 Our industry's Adaptation Council should be making itself felt more effectively
- 35 There is a danger of state-ownership of industries leading to

- inefficiency, bureaucracy, and stagnation
- 26 Advertising is a necessary investment
  - 37 The job of the sales department is simply to sell what the factory produces
  - 38 The carrying of some unprofitable lines is necessary in order to maintain our position in the market
  - 39 The customer is the best judge of our product
  - 40 It is unlikely that our present methods and pattern of distribution will need to be altered within the next five years
  - 41 Frequently when major decisions have to be made in our company there are too few facts and figures available
  - 42 The stimulus and air of change introduced by outside consultants is valuable in itself apart from the direct improvements they effect
  - 43 If free trade eventually brings about the sinking of national differences and the merging of national identities, it will be worth it for that alone
  - 44 The structure of Irish industry under free trade will bear little resemblance to that built up under protection
  - 45 It is more important to maintain our company's reputation for high-quality products than to obtain a profitable share of a low-quality market
  - 46 What Irish industry needs most is more entrepreneurs
  - 47 With personal taxation as high as it is, there isn't enough incentive for entrepreneurial work
  - 48 The individual is more important than the organisation

Here are some statements about yourself and ideas you might have about jobs. Please answer each question by circling one of the answers on the right-hand side of the page

	<i>True</i>	<i>Uncertain</i>	<i>False</i>
49 I quite often change my mind about things	T	?	F
50 I like taking risks in things I do	T	?	F
51 I prefer a job which is always changing	T	?	F
52 I do not enjoy finding myself in new and unusual circumstances	T	?	F
53 I dislike having to change my plans in the middle of something	T	?	F
54 I have never done anything dangerous for the thrill of it	T	?	F
55 I do not mind doing more than one thing at a time	T	?	F
56 I like work which has a lot of uncertainty	T	?	F
57 I like to have a regular pattern in my working day	T	?	F

Please now complete the Questionnaire by answering the questions overleaf. Thank you for all your help



## PERSONAL DATA SHEET

## INFORMANT'S NAME AND INITIALS

Date born	Place born	Nationality
Father's occupation		
Country of main education	Age leaving full-time education	
Years spent outside Ireland	(a) school/univ (b) afterwards	
Degrees/Professional Qualifications		
Participation in Professional/Trade Bodies		
Courses/Conferences attended		
Present Occupation (job title)	Date joined organisation	
Held from (date)		
<b>PREVIOUS POSTS</b>		
<i>Dates</i>	<i>Job Title</i>	<i>Nature of Organisation Approx No Employed</i>
<b>OTHER CURRENT DIRECTORSHIPS, CONSULTING POSITIONS</b>		

## APPENDIX III

## THE SAMPLE OF QUESTIONNAIRE RESPONDENTS

TOTAL NUMBER 591

	%	<i>By Age Group (No Information on 16)</i>	%
<i>By Industry</i>		Under 35	20
Extractive and Energy	4	35-39	15
Food	14	40-44	17
Drink and Tobacco	7	45-49	16
Textiles, Clothing, Footwear	19	50-54	15
Paper Products, Printing	10	55-59	12
Chemicals and Toiletries	9	Over 60	5
Non-Metalliferous Mineral Products Wood, Rubber	4		100
Metals and Engineering	17		
Distribution and Finance	7		
Transport and Tourism	9		
	100	<i>By Nationality (No Information on 14)</i>	%
		Irish	82
<i>By Firm Ownership</i>		British	16
	%	Other	2
Co-operatives	1		100
Private Companies	33		
Public Companies	55	<i>By Country of main Education (No information on 16)</i>	
State Companies	11	Ireland (Republic)	74
	100	Britain or N Ireland	23
<i>By Father's Occupation (No information on 45)</i>		Other	3
	%		100
Employer, Manager, or Director	27	<i>By Function</i>	%
Civil Service/Other State Employment	17	General Management (incl Managing Director )	33
Tradesman, Merchant, Salesman	13	Production or Engineering	18
Craftsman, Foreman, Trade Unionist	11	Secretary	12
Farmer	7	Sales Management	10
Engineer, Accountant, Banking Insurance	10	Marketing Management	8
Teacher	4	Accounting or Finance	7
Professional (Law, Medicine, Higher Education)	6	Other	12
Other	6		100
	100		

## APPENDIX III (Continued)

	No	%
<i>By Qualification (no information on 20)</i>		
No Formal Qualification	202	35
One Qualification University	55	10
Professional	139	24
Two Qualifications University only	17	3
Professional only	30	5
Univ and Prof	62	11
More than two Qual University only	5	1
Professional only	7	1
Univ and Prof	54	9
	571	100
Of the 369 with one or more qualifications, number with		
	No	
<i>University Qualification</i>		
Commerce	52	
Arts	59	
Engineering	34	
Science	35	
Other	8	
<i>Professional Qualifications</i>		
Accountancy/Secretarial	131	
Engineering/Science	56	
Marketing	12	
Other	64	

APPENDIX IV

RESPONSES TO OPINION STATEMENTS

%	% SA	% A	% U	% D	% SD	Standard Deviation	Q	% SA	% A	% U	% D	% SD	Standard Deviation
1	36	55	4	4	0	73	30	6	61	9	19	5	1 01
2	30	35	9	24	3	1 21	31	21	61	4	11	3	98
3	13	37	14	29	7	1 19	32	3	21	21	41	14	1 06
4	12	45	9	25	9	1 21	33	28	57	8	6	1	85
5	5	23	12	44	16	1 15	34	14	29	48	8	2	88
6	1	6	2	39	52	87	35	32	41	10	14	3	1 12
7	2	2	4	33	59	83	36	26	60	8	6	0	77
8	6	25	10	30	29	1 31	37	3	10	5	49	33	1 02
9	5	18	9	44	24	1 18	38	3	51	12	27	7	1 07
10	7	27	7	45	14	1 21	39	20	51	10	17	2	1 04
11	4	16	9	51	20	1 10	40	3	17	6	50	22	1 07
12	3	12	11	59	15	94	41	8	30	5	48	9	1 20
13	16	42	17	18	7	1 16	42	20	57	11	9	3	94
14	31	44	10	14	2	1 04	43	15	36	17	23	9	1 21
15	3	14	11	45	26	1 08	44	24	52	13	11	0	91
16	26	58	5	9	2	93	45	19	31	17	27	6	1 23
17	3	14	13	49	21	1 04	46	21	42	20	15	2	1 02
18	24	57	5	8	6	1 06	47	23	36	15	23	3	1 15
19	25	57	7	11	1	91	48	6	21	17	41	15	1 16
20	7	49	13	22	8	1 13		% True % ? % False					
21	30	36	14	17	2	1 10	49	61		6		32	09
22	10	27	20	37	5	1 12	50	39		18		43	88
23	23	41	15	17	3	1 11	51	64		10		26	85
24	7	28	18	30	7	1 11	52	15		10		75	73
25	36	49	6	9	1	90	53	48		10		41	91
26	2	11	14	58	15	09	54	39		9		53	92
27	11	49	9	26	5	1 12	55	85		3		12	66
28	2	16	7	51	24	1 04	56	31		21		48	84
29	5	19	8	51	16	1 13	57	32		11		57	88

APPENDIX V

THE USE OF COEFFICIENT ALPHA

An important feature of any test battery is its internal consistency or reliability - i.e. the extent to which it will yield the same results from repeated application to the same individuals. Since the test-retest method was not practicable on the present study, and is in any case open to some theoretical difficulties, a split-half method has been used for estimating the reliability of the variables entering into each factor. It has been shown that a satisfactory method of estimating the mean of all possible split-half coefficients of reliability (Alpha) is obtained from the following formula

$$\text{Alpha} = \frac{\sum r}{1 + (n-1)r}$$

where  $n$  = the number of separate items in the test,  $r_{ij}$  = the average of all the inter-item correlations, and Alpha is the reliability of the total score obtained by summing the scores on the separate items

Whereas alpha values of .90 or more are found in psychological tests aimed at discriminating carefully between individuals, it is suggested by McKennell (see below) that in survey situations where one is concerned only to distinguish between broad groups of informants alphas of .50 and above are admissible, though this is partly a matter of the researcher's judgement. In the present study .50 has been adopted as a minimum standard in admitting clusters of variables as test batteries, and the variables allocated to each factor have been partially determined by the criterion of which combination of variables yielded the highest alpha. Alphas for the factors actually used range from .51 to .73 (see Appendix VI)

#### ACKNOWLEDGEMENT

This note is based on a paper by A. C. McKennell on "The Use of Coefficient Alpha in Constructing Attitude and Similar Scales" published by the British Government Social Survey (ref. M139)

APPENDIX VI

FACTOR LOADING ON MAIN VARIABLES AND CLUSTER ANALYSIS OF CORRELATIONS

NOTE For convenience, signs have been omitted from the correlation coefficients in the following tables. They may be deduced from the factor loading signs. Items with the same factor loading sign are positively correlated, and those with opposite signs negatively.

FACTOR 1													
Factor Loading	Item	28	29	45	40	26	42	37	36	17	12	10	4
- 67	28												
- 55	29	22											
- 52	45	19	29										
- 48	40	28	21	18									
- 45	26	27	20	14	15								
+ 44	42	30	15	10	08	09							
- 43	37	20	24	16	21	21	11						
+ 41	36	26	20	09	15	15	21	08					
- 40	17	26	24	15	12	23	18	24	32				
- 34	12	18	10	18	03	14	18	16	20	33			
- 32	10	21	22	17	11	17	09	23	08	18	17		
- 32	4	16	16	16	17	08	11	20	01	16	10	16	
- 31	5	13	15	17	06	18	06	25	04	19	20	23	28
<i>Average Coefficient of Correlation</i> 17													
<i>Coefficient Alpha</i> 73													
<i>Variance Explained</i> 10.2%													

  

FACTOR 2						
Factor Loading	Item	43	24	1	13	10
+ 60	43					
+ 57	24	23				
+ 56	1	23	23			
+ 45	13	17	10	08		
+ 38	10	18	10	03	25	
+ 26	44	13	15	17	02	08
<i>Average Coefficient of Correlation</i> 15						
<i>Coefficient Alpha</i> 51						
<i>Variance Explained</i> 6.2%						

  

FACTOR 3							
Factor Loading	Item	22	34	23	35	15	12
+ 61	22						
+ 52	34	22					
+ 51	23	19	23				
+ 35	35	13	05	15			
+ 34	15	08	05	07	14		
+ 47	12	32	02	10	12	14	
+ 27	47	18	12	12	19	04	12
<i>Average Coefficient of Correlation</i> 13							
<i>Coefficient Alpha</i> 52							
<i>Variance Explained</i> 5.5%							

## APPENDIX VI (Continued)

FACTOR 4										
Factor										
Loading	Item	56	57	52	51	50				
+ 64	56									<i>Average Coefficient of Correlation</i> 22
- 63	57	32								<i>Coefficient Alpha</i> 63
- 61	52	23	29							
+ 60	51	28	23	33						
+ 54	50	21	22	16	21					<i>Variance Explained</i> 4 9%
- 42	53	18	16	22	16	17				
FACTOR 5										
Loading	Item	8	7	6	9	37	3	5	17	
- 65	8									<i>Average Coefficient of Correlation</i> 16
- 47	7	16								<i>Coefficient Alpha</i> 63
- 46	6	17	17							
- 44	9	19	17	17						
- 44	37	21	17	17	04					<i>Variance Explained</i> 3 9%
- 41	3	20	11	10	02	25				
- 37	5	08	18	15	05	25	19			
- 32	17	17	21	24	22	24	12	19		
- 30	4	08	11	10	04	20	23	28	16	
FACTOR 6										
Factor										
Loading	Item	31	16							
+ 77	31									<i>Average Coefficient of Correlation</i> 33
+ 71	16	40								<i>Coefficient Alpha</i> 60
- 64	41	34	26							<i>Variance Explained</i> 3 7%
FACTOR 7										
Factor										
Loading	Item	39	9	14	17	6				
- 62	39									<i>Average Coefficient of Correlation</i> 17
+ 52	9	13								<i>Coefficient Alpha</i> 54
- 47	14	18	08							
+ 33	17	11	22	16						
+ 28	6	11	17	12	24					<i>Variance Explained</i> 3 2%
- 42	36	17	11	27	32	11				

## APPENDIX VII

## IDENTIFICATION OF FACTORS

FACTOR 1 **Change and Market-Orientation** (Average Score+7.3)*Disagreement with the statements*

- 28 In our business we know we have the market well enough not to need any outside research
- 29 A good quality product will sell itself
- 45 It is more important to maintain our company's reputation for high-quality products than to obtain a profitable share of a low-quality market
- 40 It is unlikely that our present methods and pattern of distribution will need to be altered within the next five years
- 26 It is inadvisable to experiment with distribution policies that can upset existing arrangements
- 37 The job of the sales department is simply to sell what the factory produces
- 17 Advertising is an expensive diversion of effort, forced on us by the actions of competitors
- 12 Changes in government policies on finance, credit and taxation make planning in our industry impossible
- 10 For most business problems there is just one right answer once a person is able to get all the facts
- 4 Basically a product's price is determined by the costs of manufacture and distribution
- 5 Market research is mainly helpful in planning advertising

*Agreement with the statements*

- 42 The stimulus and air of change introduced by outside consultants is valuable in itself, apart from the direct improvements they effect
- 36 Advertising is a necessary investment

FACTOR 2 **Confidence vis-a-vis free trade based on operational efficiency**  
(average score+2.6)*Agreement with the statements*

- 43 If free trade eventually brings about the sinking of national differences and the merging of national identities, it will be worth it for that alone
- 24 Any firm that does go out of business under free trade probably deserves to
  - 1 The movement towards free trade is a desirable one
- 13 Provided our industry gets its production facilities into efficient trim it will be able to face free trade with confidence
- 10 For most business problems there is just one right answer once a person is able to get all the facts



- 44 The structure of Irish industry under free trade will bear little resemblance to that built up under protection

**FACTOR 3 Disquiet about Government policies, incentives, and adaptation**  
(average score+1 0)

*Agreement with the statements*

- 22 The government is not doing enough to create the conditions in which our industry can flourish in free trade
- 34 Our industry's Adaptation Council should be making itself felt more effectively
- 23 Some firms in our industry will almost certainly go out of business when free trade becomes effective
- 35 There is a danger of state-ownership of industries leading to inefficiency, bureaucracy, and stagnation
- 15 Results are what matter in business how you get them isn't important
- 12 Changes in government policies on finance, credit and taxation make planning in our industry possible
- 47 With personal taxation as high as it is, there isn't enough incentive for entrepreneurial risk

**FACTOR 4 Liking for risk and uncertainty** (Average score+1 0)

*Agreement with the statements*

- 56 I like work which has a lot of uncertainty
- 51 I prefer a job which is always changing
- 50 I like taking risks in things I do

*Disagreement with the statements*

- 57 I like to have a regular pattern in my working day
- 52 I do not enjoy finding myself in new and unusual circumstances
- 53 I dislike having to change my plans in the middle of something

**FACTOR 5 Flexibility in Sales Policy** (Average score+5 6)

*Disagreement with statements*

- 8 Basically in business it is every man for himself
- 7 A manager has continually to resist the tendency of things to change
- 6 Provided we succeed in selling a planned level of production we are not too concerned whether the total market for our product expands or contracts
- 9 In our business we have to cater for consumers who don't really appreciate a quality product
- 37 The job of the sales department is simply to sell what the factory produces
- 3 It is advisable to maintain a wide product-range in order to guard against failure in any one line

**APPENDIC VII (Continued)**

- 5 Market research is mainly helpful in planning advertising
- 17 Advertising is an expensive diversion of effort, forced on us by the actions of competitors
- 4 Basically a product's price is determined by the costs of manufacture and distribution

**FACTOR 6 Company Confidence (Average score+2 0)***Agreement with the statements*

- 31 Co-operation and communication between senior management in our company is good
- 16 My Company has a pretty clear idea of where it is going over the next three or four years

*Disagreement with the statement*

- 41 Frequently when major decisions have to be made in our company there are too few facts and figures available

**FACTOR 7 Product Orientation (Average score—5 3)***Agreement with the statement*

- 9 In our business we have to cater for consumers who don't really appreciate a quality product
- 17 Advertising is an expensive diversion of effort, forced on us by the actions of competitors
- 6 Provided we succeed in selling a planned level of production we are not too concerned whether the total market for our product expands or contracts

*Disagreement with the statement*

- 39 The customer is the best judge of our product
- 14 It is our job to create the need for our products as well as the products themselves
- 36 Advertising is a necessary investment

## APPENDIX VIII

## PATTERNS OF HIGH AND LOW SCORING ON SEVEN FACTORS

H=High L=Low ( )=Inconclusive

MO=Market Orientation  
 FTC=Free Trade Confidence  
 RL=Risk Liking  
 GD=Government Disquiet

SF=Sales Flexibility  
 CC=Company Confidence  
 PO=Production Orientation

	MO	FTC	RL	GD	SF	CC	PO
<i>Industry</i>							
Food Processing	L	(L)	H	L	—	—	L
Drink/Tobacco	H	—	L	—	H	H	L
Textiles/Clothing	—	H	(H)	—	—	L	H
Paper/Printing	L	—	—	L	(L)	L	H
Chemicals/Toiletries	H	—	—	—	—	—	—
Clay/Glass etc	L	—	—	—	—	(H)	—
Metals/Engineering	L	L	H	—	—	—	—
Distribution/Finance	(L)	H	—	—	—	—	—
Transport/Tourism	H	(L)	L	H	—	—	L
Extractive Energy	—	L	L	—	—	H	—
<i>Company Ownership</i>							
Private family control	—	H	—	L	—	L	—
other local	L	—	—	L	—	L	H
company	H	—	—	L	H	H	L
foreign company	H	—	—	L	—	—	—
other	L	L	H	—	—	L	—
Public family control	L	L	H	—	—	—	(H)
other local	—	—	—	—	—	—	(L)
company	H	(H)	—	—	H	H	(L)
foreign company	L	(H)	L	(H)	L	H	H
other	H	L	L	H	H	(L)	(L)
State Owned	H	L	L	H	H	(L)	(L)
<i>Management Function</i>							
General Management	L	—	—	L	—	H	—
Secretary/Accountant	L	L	—	L	L	(H)	H
Production/Engineering	L	—	H	L	L	L	H
Sales	H	H	(L)	H	H	H	L
Marketing	H	—	—	H	H	L	L
Other	H	L	(L)	(H)	H	—	L
<i>Status</i>							
Chief Executive	L	L	—	—	(H)	H	(L)
Other Director	H	H	H	(L)	H	(L)	L
Non-Director	L	—	—	H	L	L	H

## APPENDIX VII (Continued)

	MO	FTC	RL	GD	SF	CC	PO
<i>Age</i>							
Under 45	H	(L)	(H)	H	H	—	L
45-50	—	—	—	H	—	—	—
Over 50	L	H	(L)	L	L	—	H
<i>Father's Occupation</i>							
Employer/Manager	H	—	H	—	—	—	L
Engineer/Accountant/ Banking/Insurance	—	(L)	H	H	H	—	—
State Employment	H	—	L	—	—	H	%
Craftsman/Foreman	—	H	—	—	L	L	H
Merchant/Salesman	—	—	—	L	—	H	—
Farmer	L	—	H	—	(L)	—	(L)
NB Other occupational groups were also examined but yielded no significant patterns							
<i>Age leaving full time education</i>							
Under 18	L	(H)	L	—	—	—	—
18-20	—	—	—	—	—	—	—
Over 20	H	L	—	H	—	—	—
<i>Qualifications</i>							
None	L	H	H	L	L	—	—
One	H	L	L	H	H	—	—
Two	H	L	L	H	H	—	—
More than Two	H	L	—	—	—	—	—
University only	H	L	—	H	H	L	L
Professional Only	(L)	H	—	L	H	H	H
<i>University Qualifications</i>							
Commerce	H	—	—	—	—	H	—
Arts	H	—	—	H	H	L	L
Engineering	L	L	—	—	—	—	H
Science	L	—	—	(H)	H	L	—
Other	—	(L)	—	H	—	H	—
<i>Professional Qualifications</i>							
Finance	—	—	H	—	—	H	H
Engineering/Science	L	H	(H)	—	L	L	H
Marketing	H	—	—	H	—	—	—
Other	(L)	H	—	L	—	H	H

## REFERENCES

In the general design of the project I obtained considerable help from Mr Breffni Tomlin and his book *The Management of Irish Industry* (I M I 1966) Other useful sources at the design stage were

*The Management of Innovation* by Burns and Stalker (Tavistock Institute 1961)

*Managers - Personality and Performance* by K Rogers (Tavistock Institute 1963)

*Investment and Growth Policies in British Industrial Firms* by T Barna (C U P 1962)

*The Psychology of Politics* by H J Eysenck (Routledge 1954)

The section on Principal Components Analysis is based upon the following works, together with that by McKennell referred to in Appendix III

*Modern Factor Analysis* by H H Harman (University of Chicago Press 1967)

*Multivariate Procedures for the Behavioural Sciences* by W W Cooley and P R Lohnes (John Wiley and Sons 1962)

*A Comparison of Five Techniques of Data Analysis* by J Raven and J Ritchie (Government Social Survey M 134)

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My wife, who has acted as my secretary and undertook the task of organising my contacts and appointments, records and follow-ups, is largely responsible for anything that has been done and any results that have emerged

## DISCUSSION

*Mr B Tomlin* I am sure that we are all very grateful to Mr Dillon-Malone for his most interesting talk Indeed, not merely ourselves, but those charged with policy decisions should be thankful that so important a topic has been tackled at this time At a time when our programme of industrial adaptation is being reviewed it is heartening that information on

businessmen's attitudes and practices, which are crucial to the success of adaptive measures, has been made available. I hope that Mr Dillon-Malone's experience and expertise will be used in the process of review.

I shall confine my remarks about the paper to its methodology, since Dr Cunningham wishes to deal with its content.

I do not wish to be excessively purist, but I feel that it is a pity that a completely probabilistic sample was not used, despite the difficulty of doing so. Whatever one may wish, and however many qualifications one may attach, a result capable of being expressed in numerical form has a way of passing into currency as an established fact. Given the sample drawn, the rate of response was extraordinary and is a credit to Mr Dillon-Malone. Irish managers have again shown themselves willing, to an extent which I believe would not be matched in any other country, to respond to questions which they see as relevant, put to them by a person whom they perceive as competent. This has implications beyond the present project, and indeed beyond research work generally.

The attitude questionnaire is essentially an inventory, operating on a conscious level and capable therefore of manipulation by the respondent. I wonder if Mr Dillon-Malone has any evidence, or personal belief, about the validity of responses. Have all respondents given their genuine opinions in reply, or has there been any tendency to give answers which the respondents believe reflect more credit on themselves? I feel this may have been possible to some degree in the section on attitudes to risk.

I should like to ask for illumination on some points in the factor analysis used. I am tempted to do so, not because I believe they invalidate the analysis, but because some of them may have contributed to the surprisingly low communalities resulting from it.

- 1 The basic step in the factor analysis is the calculation of product-moment correlation co-efficients. These co-efficients require that the variables be measured in at least an interval scale. It is unlikely that the form of measurement used – assigning a score 2, 1, 0, —1, —2, to various replies – achieves this.
- 2 When tests of significance are being carried out, whether about the number of common factors or the significance of factor loadings, it is assumed that the variables are normally distributed, which also seems unlikely given the scoring used.
- 3 Either model – principal components or classical factor analysis – assumes a linear relationship between factors and variables. Is it possible that the relationship in this case is non-linear?
- 4 The model used is the principal components model, not the classical factor analysis model.
  - (a) It is usually the *principal factor* solution to the classical model which is transformed for rotation by the varimax method. I wonder (because I do not know) whether it is justifiable to carry out this process for a solution to a quite different model?
  - (b) Would it be possible even at this stage to obtain a principal factor solution using the classical model? I ask because it would allow, which the principal components model does not, a decomposi-

tion of a unique factor into a specificity and an unreliability component

- (c) Would a different model, or a different form of solution, e.g. maximum likelihood, have given a different result?
- 5 I feel it is important to account for the low level of the communality. If not contributed to by the failure of one or other conditions mentioned above, it must be because the questions are highly specific or highly unreliable. I can see no reason why they should be particularly specific especially since the factors eventually isolated compare very closely with the topics on which the questions were chosen to throw light. Mr Dillon-Malone has himself suggested an ingenious, but discomfiting, explanation suggesting that reliability is low. He has found that managers' actual practices do not accord closely with their expressed attitudes and suggests that this dichotomy between action and word may result in near-random answering of questions. This suggestion, if true, implies a degree of confusion in the minds of top executives about important matters, that is not reassuring.
- 6 The method of factor scoring used must greatly have simplified calculations. Is there a possibility that it will invalidate later contrasts between the factor-scores of different groups? Incidentally, it is stated that "the coefficient of correlation of each variable with each factor is called a loading". I do not think that this is generally true. The factor loading is the coefficient of the factor in the factor *pattern*. What was described above is an element of a factor *structure*. Structure elements do not equal pattern coefficients unless the common factors are uncorrelated. This is certainly the case in the model used, but not necessarily in all models.

I have raised the questions above, not because I feel that the results of the analysis are invalidated, but because I believe them to be both valid and valuable, and because I should not like to see their validity questioned later because of the low communality to which I already referred. So far as the factors themselves go, they appear unitary and in accordance with common sense. Mr Dillon-Malone has called factor two "Confidence *vis-a-vis* free trade based on operating efficiency". He has since suggested, and I think correctly, that it is both more general and more interesting than this. It seems now to be indicative rather of general rigidity and of a rather retributive and Old Testament cast of mind. Some support is lent to this interpretation by the fact that it is usually associated with low scores on factor four – liking for risk and uncertainty.

Concerning this last factor, some surprises may be occasioned by the provisional finding that executives of semi-State concerns score on it more highly than do others. Is it possible that intervening attributes account for this association e.g. that semi-State executives are younger and/or better educated than others, both of which attributes are associated with higher tolerance of risk? May it also be possible that executives in this case gave an "acceptable" answer or simply that risk appears more punishing and consequently undesirable in private business than to people in semi-State

businesses who, to an extent, are cushioned against its consequences?

Finally, I look forward in the final report to seeing, not only contrasts between the scores of different groups, but also the general level of factor scores for all respondents, so that we can see just where the generality of executives stand on market orientation, company confidence and so on.

I have raised a lot of points which may appear negative. Before I finish I should like to reiterate what I said at the beginning that this is a project of major importance. Mr Dillon-Malone set himself a most ambitious task. He has completed it brilliantly and in a space of time which I find incredible. I should now like formally to propose a vote of thanks to him on behalf of the Society for reading us his paper.

*Dr A C Cunningham* I intend in my few words tonight to place emphasis on the social rather than the statistical aspects of the paper which we have just heard. I think it is evident that this paper is a major milestone in empirical research work on Management in Ireland. It is, I believe, a significant complement to the study undertaken by Mr Breffni Tomlin who proposed the vote of thanks. Mr Tomlin's study which was undertaken in 1964-66 was by nature quantifiable. Mr Dillon-Malone's study is by nature, behavioural, therefore, I think they are very much complementary.

The problem of adaption to change which was raised in the paper brings me to the relationship between change and progress. It is very important to emphasise this relationship as there appears to be considerable confusion in people's minds about it. We are all in favour of progress but there are many people who oppose change. However, progress is impossible without change. Change may not lead to progress – in fact, it can often lead to regression. Nevertheless, by definition, one cannot have progress without change. If this relationship were better understood we would witness more progress.

To emphasise that the rate of change is accelerating has become something of a cliché but it is nevertheless true. If we accept the definition of the marketing concept in strategic terms as “adjusting the firm to its environment” and if the environment is in a period of rapid change, then in order to be successful in marketing the rate of adjustment within the firm must proceed at an accelerated pace. This situation places a colossal strain on any organisation which is trying to adjust, and, in fact, it may well tear itself asunder in the process. If you visit the lecture halls and seminar rooms of UCD at the moment you will see an organisation struggling with the problems of change.

Irish Industry has been and is trying to adjust, but the speaker has raised the question in his paper – Is it going about this in the “best” manner? Looking at the results of the survey, it appears that on one attitude dimension at least, Irish Industry is ready for change. If you look at Opinion Statement No 1 (“The movement towards free trade is a desirable one”) you will see that 92 per cent of the respondents were in agreement and this, I think, is the highest degree of agreement reached on any of the opinion statements. Certainly it had the smallest standard



deviation. However, on many of the other attitude dimensions, it is not so clear that Irish Industry is ready for change and progress.

As one engaged in marketing education at University level particularly in relation to the B Com, graduates, who now number approximately 200 per year from U C D alone, (80 per cent of whom find employment in Ireland), I was interested in the findings pertaining to Commerce and Arts graduates. Following the results from Mr Tomlin's study in 1966, which indicated that the opinions held by Managers of Commerce Graduates was anything but flattering, it was particularly gratifying to see the satisfactory profile these graduates presented in Mr Dillon-Malone's study. This fact combined with the happy result on the "under 45 year old" population characteristic, I find most encouraging. I think it augurs well for the future.

Returning to the problem of adaption, Mr Dillon-Malone's study raised some fundamental questions which must be asked in relation to public policy in this area. Has our public policy so far encouraged the type of organisation that is likely to succeed and grow under the radically changed environment of free trade? I think not. Or at least not to a sufficient extent. It has concentrated rather on helping firms to do a little better than which they have done in the past. As Mr Dillon-Malone has stated, public policy has been "production-orientated". Even today grants for Management Training are confined to manufacturing and distributing firms. Service industries are apparently regarded in Government thinking as economically unproductive and perhaps even 'parasitic'. Distribution was regarded in this light until fairly recently. Adaption requires that people be adaptive to change - in fact, to learn to manage change. This paper we have just heard indicates the short distance we have travelled and points out the difficult uphill road ahead. It has been an invaluable contribution to our understanding of current managerial problems. Therefore, Mr Chairman, I have great pleasure in formally seconding the vote of thanks.

*Professor R Lynn* Mr Dillon-Malone's observation that the effect of adaptation grants has been to freeze the existing structure of Irish Industry seems to me both interesting and important. It parallels the protests which many British industrialists have made about Government grants which have recently replaced tax incentives as inducements to set up in areas of high unemployment. I have the impression that most businessmen prefer tax concessions as a means of financial incentive.

More generally, adaptation grants are a facet of Government interference with the workings of the market and I should like to see more questioning of the extent to which this is taken in Ireland. While in the discussion Dr Whitaker has made the point that adaption grants are open to all, thus avoiding some features of Government direction, the question remains of whether any adaptation grants are necessary. If a product would be unprofitable without a grant, should it be supported or might not the capital be better deployed elsewhere? If the product is profitable without a grant, why subsidise it at the expense of the taxpayer? Adapta-

tion grants require capital, which is today an expensive commodity and may be better employed in the private enterprises of private persons. Furthermore, Government subsidy can only be provided for out of taxation, which runs at a high level in Ireland. Thus the inefficient are liable to be supported at the expense of taxation levied on the efficient.

I raise these matters because I have the impression that there is very little discussion at the present time in Ireland of the basic principles of Government intervention in the workings of the market. I hope Mr Dillon-Malone will develop his interesting conclusions at greater length.

*Mr H Munroe* I would like to be joined with the vote of thanks for this excellent paper. I have two points to make, one being philosophical, and the other technical. The philosophical point refers to the nature of change, about much is said in the paper and about which much has been said during the discussion. I think much confusion is possible when thinking about change because I think we use the one word "change" to describe two concepts which cannot meaningfully be described under the same word. There are two kinds of change – foreseen or foreseeable change, and unforeseeable change. When people talk about the importance of adapting to change and being ready to change, it is presumably unforeseeable change to which they refer. The job of science is to increase the amount of foreseeable change, but – and this is important – this does not necessarily mean a reduction in the amount of unforeseeable change. Change can only be observed insofar as one has previously observed order. One can only observe the sea to be rough because one has previously observed it to be calm. So that we can only observe unforeseeable change, and it can only surprise and disturb us, in so far as we have previously had a scientifically-based, or at least ordered, way of looking at things which this unforeseeable change has proved to be inadequate. So it may well be that the continued application of scientific and ordered thought to marketing and similar problems is helping to create unforeseeable change, not reduce it.

To turn to my technical point. I am wondering about the subjective effect of Mr Dillon-Malone's own personality and thinking on the framing of the questionnaire. May it not be that when he gets a set of correlated replies from ten different questions that he is in fact asking what is, underneath it all, the same question ten times? And if he gets a definite response to another question, but finds that none other of the questions formulated by him draw a correlated response to it, can this question not be an important question which he has happened to ask only once?

*Mr P J Dillon-Malone* I am grateful for so much useful comment and so many searching questions. Of the latter, I can deal here only with a few.

Mr Tomlin asks whether I have evidence or opinion about the validity of the responses. I would say that despite the presence of an error or random element in the responses, patterns have emerged which make unmistakable sense and which could not have occurred by accident. Even if absolute levels are distorted, the basic objectives of arriving at reliable factors and discriminating between respondent groups have been achieved.

Regarding the method of scoring responses I have in fact tried other weightings besides the scale plus  $\times 2$  to minus  $\times 2$  the results have been practically the same

I am not qualified to comment fully on the question of rotating a principal components solution I can only reply that rotation is in fact commonly performed on such solutions, and I have simply followed a practice of my betters The data could of course be submitted to principal factor analysis, and one of my trial tabulations was of such a model You may be interested to know that the resulting factors looked very much the same as those obtained by principal components

As to sampling methodology, I have perhaps given the impression that the purposive element in selection was substantial it was not, and I would claim that the selection basis for the total sample was as near probability as makes very little difference

I share some of Professor Lynn's views on the relationship of government to industry However, I would suggest that it is as much the responsibility of industry as of government to take steps to avoid any possible rigidifying effects of government incentives and taxation

I am less certain than Mr Munroe that foreseeable and unforeseeable change are qualitatively different In my view, all future events are located somewhere on the same scale of probability – some very high on the scale, some very low While I agree that present economic, scientific and technological trends are decreasing our certainty about the future, I would maintain that this argues for greater and more sophisticated (and more flexible) planning, not less "Fortune favours the prepared mind"

To Mr Munroe's other point, about the framing of the questionnaire, I can say "yes" You can only get out of such a technique what you put into it There are obviously many more dimensions to personality and attitudes than are tapped in the questionnaire, and I acknowledge that some of them may be equally important and relevant, or more so However, what we have got is provably of some significance, and I hope that in time others will improve on it