FINANCIAL DISCLOSURE FOR DIVERSIFIED OPERATIONS:

A critique of the orthodox model, and some tentative proposals

A thesis submitted for the degree of

Doctor of Philosophy

in the

University of Kent at Canterbury

B A Rutherford

November 1979

For
L G R
in memory

CONTENTS

PREFACE

The research reported in this study was begun at the University of Lancaster under the supervision of Michael Mumford and my thanks are due to him and to other members of the Department of Accounting and Finance for their help in the early stages of the work.

The research was completed at the University of Kent at Canterbury and I should like to thank my colleagues Peter Bird and Graeme Macdonald for their helpful comments on earlier drafts of the text.

B A R

ABSTRACT

The aggregative information disclosed by all entities will represent a lower quality of reporting in the case of diversified organisations because it will be more difficult to place the information in context. However, the boundaries of industrial activity are poorly defined and this will cause cause substantial difficulties for any attempt to restore the quality of information disclosed by diversified organisations.

This study is based on the view that financial reports should be veritable (ie be shown to have real-world referents). The orthodox model for reporting the results of diversified operations requires that allocations be made according to the criterion of benefit. In the, almost inevitable, presence of interaction, such allocations cannot have real-world referents and thus reports drawn up using the orthodox model cannot be veritable. Empirical evidence suggests that the attempt to require the publication of such reports in the UK has yielded uneven and inconsistent information.

The treatment of interaction in the literature dealing with the orthodox model is confused. If interaction effects can be identified and measured, they can be disclosed separately or summarised by means of the range of ambiguity. Reports incorporating this information are likely to be highly complex and difficult to interpret. A variety of proposals for dealing with the problems of allocation in financial reports is examined in the context of diversified operations, but the proposals are found to be unsatisfactory. Some tentative suggestions concerning the search for a veridical reporting scheme are made.

Finally, the boundary condition management model is developed. Since diversification causes a loss of quality of information available to outside parties, it is argued that such parties should be given some control over the process, together with the necessary information. Internal boundary condition management should provide some scope for improving performance and disclosures relating to this improvement should be made.

LIST OF TABLES

Table

Table

LIST OF FIGURES

Figure

Chapter 1

INTRODUCTION

1.1 THE NATURE OF DIVERSIFIED OPERATIONS: CONTINUITY AND DISCONTINUITY

The easy way to conceptualise diversified operations is presented diagrammatically in figure 1.1. The production sector of the economy is divided up into a number of discrete industries; each industry is homogeneous within itself but significantly different from all other industries. The acquisition (whether by organic growth or the purchase of existing concerns) of additional capacity within the same industry may take the form of the replacement of existing capacity, or of vertical or horizontal integration. Whatever form it takes, it leaves the firm as a unitary enterprise operating within a single industry. By contrast, diversified acquisition involves 'breaking through' the discontinuity at the limit of the industry and acquiring (by either method) capacity within a different industry. Viewed from this perspective, diversified operations are easy to define and equally easy to identify.

Unfortunately, the world obstinately refuses to conform to this conceptualisation:

> 'When one attempts to define an "industry", however, matters are not ... simple. At first sight, the solution seems obvious, namely, to group together all those firms that produce the same product or service. This requires a definition of what constitutes the same product or service. Strictly, all firms produce different products because the products of two separate firms are produced at

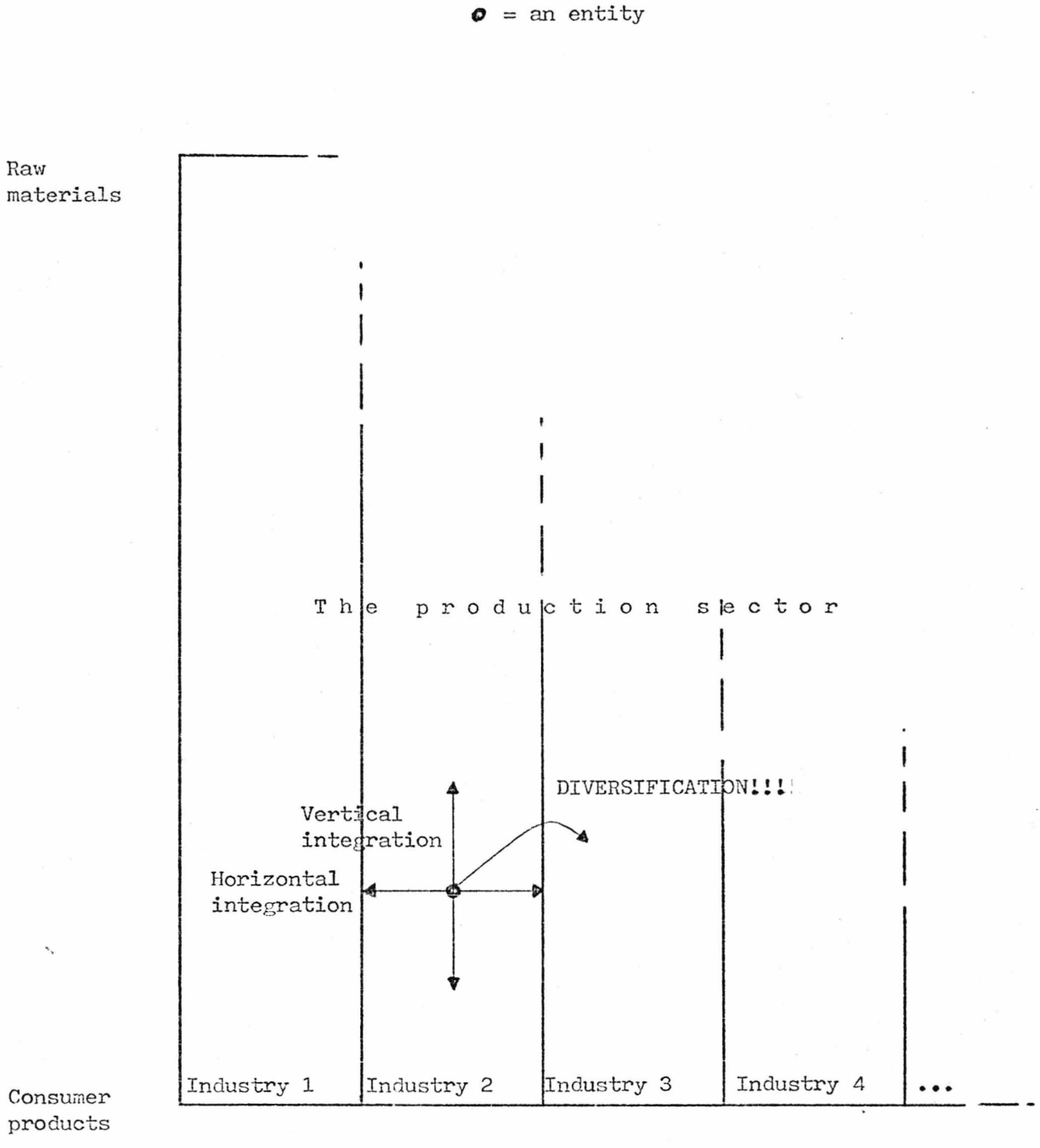


Figure 1.1: The easy way to conceptualise diversified operations

> different geographical locations. Such a definition yields single-firm industries, and is too narrow for most purposes. At the other extreme, all products and services are the same in that they compete for consumers' purchasing power. Such a definition yields an economy-wide industry, and is too wide for most purposes.
>
> There must be some aspect which is common to all firms in an industry, this much is clear. But there are many possible criteria for grouping firms into separate industries. Thus, one might group firms together according to common processes employed.... Alternatively, the grouping could be based upon the use of common raw materials.... Again, one might group together firms producing a product with identical physical characteristics. It is clear that one is likely to get different groupings of firms depending upon whether the "same" product means physically identical, using the same process in its manufacture, or using the same inputs.'[1]

In reality, then, industries are not discrete 'walled cities'. Rather, they are vague and fuzzy areas within a continuous soupy medium of industrial activity. Such a conception is presented in figure 1.2. The wavy and broken lines represent ill-defined frontiers rather than substantial boundaries. A-B is a continuum stretching between capacity, the acquisition of which would obviously be horizontal integration - capacity which is, as it were, 'next door' to the firm - and capacity, the acquisition of which would obviously be conglomerate diversification, because the two activities in question are extremely remote from each other. It should be noted that the division of the production sector into industries represented in the diagram is relative, that is to say it relates to the particular firm in the diagram; it is not an absolute framework into which other firms could be fitted without modification.

---

1 D Needham, Economic analysis and industrial structure (London: Holt, Rinehart and Winston, 1970), pp 17-18.

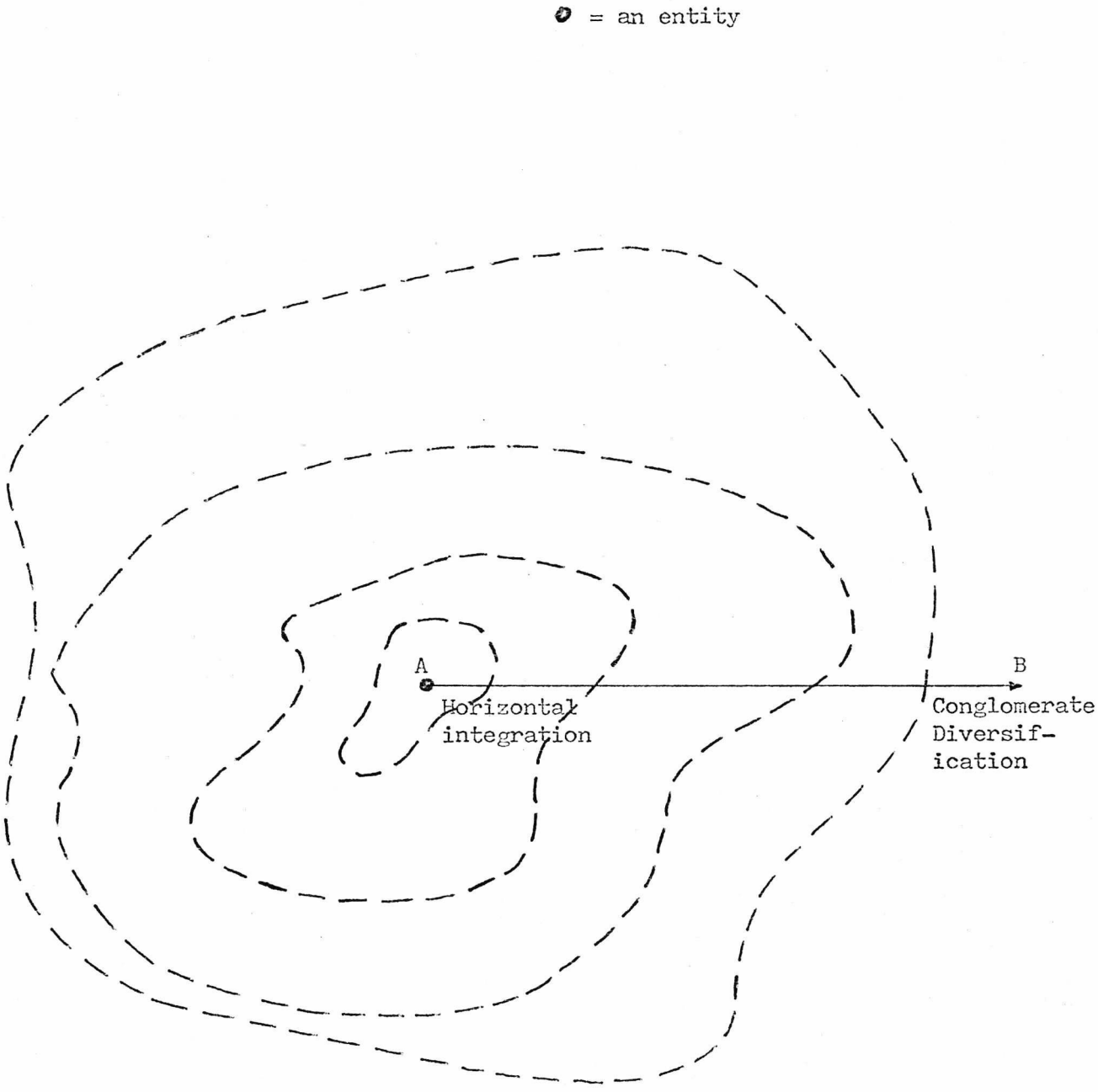


Figure 1.2: The nature of diversified operations

Briefly, then, it follows from the continuous nature of industrial activity that the concept of diversification employed in this research is highly relativistic: diversified operations must be defined in terms of regions along a continuum rather than in terms of identifiable discontinuities, and further the continuum itself must be defined in relation to particular entities rather than generally.

It is perhaps because of this characteristic of diversification that the literature on financial disclosure for diversified operations is reluctant to define what would count as a diversified entity. Mautz, in an early and seminal work on the subject, offered this definition:

> '[A diversified company is] a company which is so managerially decentralised, so lacks operational integration, or has such diversified markets that it may experience rates of profitability, degrees of risk, and opportunities for growth which vary within the company to such an extent that an investor requires information about these variations in order to make informed decisions.'[1]

This definition makes it agreeably easy to say whether diversified operations should report disaggregated information, and Mautz did actually use it for this purpose, despite the evident circularity of the argument.[2] Perhaps the most important limitation of Mautz's definition is that it offers no means of dividing the company up into sections so as to determine whether the sections have significantly different characteristics of the sort discussed. Without such a means it is difficult to know how to identify a diversified company. The easy approach to diversification provides a simple tool: the industry. The relativistic notion of diversification suggests that

---

1 R K Mautz, Financial reporting by diversified companies (New York: Financial Executives Research Foundation, 1968), pp 7-8.

2 Mautz, p 161.

the problem will be much less tractable, and this is indeed the case. The problem of segment definition is taken up at various points in this study.[1]

Later works often avoid the embarassment of confronting the problem by first investigating the issue of whether any reporting on a 'less-than-total-entity basis'[2] should be required. Who could be so churlish as to demand a definition of what would count as a unit smaller than the total enterprise? For example, the relevant FASB Discussion memorandum,[3] which carries the sub-title 'An analysis of issues related to financial reporting for segments of a business enterprise', presents a summarised list of 'issues', 'questions' and 'possibilities' running to four pages[4] but does not address itself to the question of what a 'segment' might actually be. The first issue to be considered is 'should information about segments of a business be included in financial statement?' Having established that such reporting is desirable, it remains to decide how segments should be established. A classification scheme based on industries then seems a natural possibility. The standard which followed the FASB memorandum, for

---

1 See, particularly, chapter 3.

2 Financial Accounting Standards Board Statement of Financial Accounting Standards Number 14: Financial Reporting for Segments of a Business Enterprise, December 1976 (Stamford, Connecticut: Financial Accounting Standards Board), p 29. The standard will henceforth be cited as SFAS 14.

3 Financial Accounting Standards Board, Discussion memorandum: An analysis of issues related to financial reporting for segments of a business enterprise (Stamford, Connecticut: Financial Accounting Standards Board, 1974).

4 Financial Accounting Standards Board, Discussion memorandum, pp viii-xi.

example, required that 'the financial statements of a business enterprise ... [should] include information about the enterprise's operations in different industries....'.[1] The standard did not define an industry. It did define an 'industry segment' as 'a component of an enterprise engaged in providing a product or service or a group of related products and services....'.[2] This suggests that an industry should be regarded as comprising enterprises which supply related goods and services, which does not take the question any further than the inconclusive discussion cited earlier.[3]

1.2 THE IMPORTANCE OF DIVERSIFIED COMPANIES, AND OF REPORTING THEIR OPERATIONS

Economists have been prepared to make approximate measures of diversification, and these show that increasing diversification is a characteristic of industrial development. Berry[4] investigated 460 large US companies between 1960 and 1965, and found that in this comparatively short period these companies had substantially increased the number of industries (defined in terms of the classification scheme used for statistical purposes in the US) in which they operated.[5] His results are set out in table 1.1.

---

1 SFAS 14, p 1.

2 SFAS 14, p 5.

3 pp 1 and 3.

4 C H Berry, 'Corporate growth and diversification', Journal of Law and Economics, 1971, pp 371-83.

5 Although he went on to argue that this overstates the extent of the diversification because the new operations were on a relatively minor scale, his main conclusion survives.

Table 1.1

460 large US industrial corporations, by number of two-, three- and four-digit industries in which products were reported, 1960 and 1965

Number of industries:	Number of corporations: Four-digit 1960	1965	Three-digit 1960	1965	Two-digit 1960	1965
1 - 5	168	138	217	183	354	310
6 - 10	136	109	146	126	95	129
11 - 15	76	87	53	94	11	20
16 - 20	40	62	28	25		1
21 - 25	16	26	9	18		
26 - 30	11	12	3	5		
31 - 35	4	10	1	5		
36 - 40	3	4	3	1		
41 - 45	1	4		2		
46 - 50	2	3		1		
51 - 75	3	4				
76 and over		1				
Total	460	460	460	460	460	460
Average number of industries	9.9	13.9	7.1	8.7	3.8	4.4

Source: Berry.

In the face of increasing diversification, many authoritative pronouncements in the field of financial reporting have included recommendations that disaggregated information should be disclosed by diversified operations. In 1966, the American Accounting Association's, now famous, study, A statement of basic accounting theory, concluded that,

> '... it would be helpful to external users to have ... separation of revenues, costs or expenses, and assets by product or divisional lines.'[1]

An investigation by the Accountants International Study Group agreed that,

> 'Financial statements of diversified companies should include information on separate segments.'[2]

The Trueblood report considered that,

> 'Each of the financial statements should be structured to enhance the user's ability to assess ... the extent to which sacrifices and benefits pertain to various lines of activity of the enterprise.'[3]

The corporate report echoed this view:

> 'We consider it desirable that the following information ... should be disclosed about each main class of activity:

---

1 American Accounting Association, A statement of basic accounting theory (Sarasota, Florida: American Accounting Association, 1966), p 31.

2 Accountants International Study Group, Reporting by diversified companies (London: Institute of Chartered Accountants in England and Wales, 1972), paragraph 86.

3 American Institute of Certified Public Accountants, Objectives of financial statements (Report of the Study Group on the Objectives of Financial Statements)(New York: American Institute of Certified Public Accountants, 1973), p 39.

(a) Turnover.
(b) Value added.
(c) Profits or losses before tax.
(d) Capital employed.
(e) Employment information.'[1]

Several authorities not normally associated with accounting pronouncements have emphasised the importance of disaggregated information for the proper control of multinational enterprises, including the Organisation for Economic Co-operation and Development:

> 'Multinational enterprises should ... publish ... sales in the major lines of business for the enterprise as a whole....'[2]

A Group of Experts reporting to the United Nations proposed regulations for the control of multinational enterprises under which,

> 'Disaggregation of certain consolidated financial information is required by line of business.'[3]

Finally, Her Majesty's Government considered the issue in a recent Green Paper:

> 'The Government proposes that for the company's activities both in different lines of business and in different geographical areas, information should be disclosed about turnover, profits, capital employed and employment.'[4]

---

1 Accounting Standards Steering Committee, The corporate report (London: Accounting Standards Steering Committee, 1975), p 59.

2 Organisation for European Co-operation and Development, International investment and multinational enterprises (Paris: Organisation for European Co-operation and Development, 1976), p 14.

3 United Nations, International standards of accounting and reporting for transnational corporations (Report of the Group of Experts on International Standards of Accounting and Reporting to the United Nations Economic and Social Council Commission on Transnational Corporations)(New York: United Nations, 1977), p 53.

4 HMSO, The future of company reports (Cmnd 6888)(London: HMSO, 1977), p 14.

1.3 THE CASE FOR EXTENDING DISCLOSURE OF DIVERSIFIED OPERATIONS

The case for extending disclosure of diversified operations has been debated at length, and at a variety of levels of sophistication in the literature[1] and it is not the purpose of this study to reproduce, or attempt to resolve the arguments. User needs have been examined by both positive[2] and normative[3] methods. Many discussions have developed out of the broader issue of whether any extension in disclosure is desirable; the nature of the orthodox model for reporting diversified operations makes it particularly attractive to those who adopt information-theoretic approaches, because it involves the disaggregation of totals which are already reported, and hence fits neatly into such approaches.

The most general - and therefore perhaps the most persuasive - normative statement of the case for disclosure[4] is that such disclosure is

---

1 See, for example, Mautz, pp 81-124; Financial Accounting Standards Board, Discussion memorandum, p 6; C R Emmanuel and S J Gray, 'The segment reporting issue', Management Accounting, July/August 1977, pp 296-7; and A F Lamb, Analysed reporting: a background study (London: Institute of Chartered Accountants in England and Wales, 1977), pp 29-31.

2 See, for example, Mautz; and M Backer and W B McFarland, External reporting for segments of a business (New York: National Association of Accountants, 1968).

3 See, for example, A Rappaport and E M Lerner, A framework for financial reporting by diversified companies (New York: National Association of Accountants, 1969).

4 See L Schachner, 'Accountability under industrial diversification', Accounting Review, 1968, pp 303-11.

necessary to restore the extent of disclosure which was taking place before diversification. The argument depends on the weak assertion that there must be some use to which accounting information may legitimately be put which involves the comparison of data about the enterprise with 'external' data drawn from the industry or sector of the economy in which the enterprise operates. Such data could relate to other enterprises within the sector or to the sector as a whole. The user of the information and the use to which it is put need not be specified. If the assertion is true then accounting reports containing only aggregated information about a diversified enterprise provide less scope for the making of proper comparisons (and are in that sense less useful) than reports about unitary organisations containing the same 'quantity' of aggregated data. Thus disaggregated data is necessary, not as an extension of disclosure, but as a means of restoring the status quo.

The case against extending the disclosure requirements applicable to diversified operations has been advanced with great vehemence if little success.[1] As explained above, the present study does not attempt to reconcile the arguments. The position that is adopted in the remainder of this study is that the extended and active interest shown in the topic makes it worth examining the feasibility of extending the disclosure requirements applicable to diversified operations in a satisfactory way before the question of whether such an extension

---

1 D E Browne, 'Discussion of SEC and antitrust viewpoints', in A Rappaport, P A Firmin and S A Zeff (eds), Public reporting by conglomerates (Englewood Cliffs, New Jersey: Prentice-Hall, 1968), produced the arresting argument that segmental disclosure should not be made compulsory on the grounds that this would infringe the Fifth and Fourteenth Amendments to the US Constitution relating to the deprival of liberty. For some objections which have received wider support, see Financial Accounting Standards Board, Discussion memorandum, p 7; Emmanuel and Gray, p 296; and Lamb, pp 31-2.

is desirable has been resolved. Indeed, it may well be that an investigation into methods will make some contribution to the resolution of this issue.

1.4 TERMINOLOGY

For the purposes of this study, the term financial disclosure for diversified operations (generally abbreviated to FDDO) is applied to any form of disclosure designed to provide information about the activities of the various components (in the sense described earlier) of a diversified enterprise. Diversification is to be interpreted in the manner suggested earlier in this chapter, and an organisation which is not diversified is described as unitary. The orthodox version of FDDO, which is described in chapter 3 is often referred to in the literature as segmental, analysed, class-of-business or line-of-business reporting, and these terms are generally used interchangeably (though with a preference for the first) hereafter.

Chapter 2

VERITY IN FINANCIAL REPORTING

2.1 INTRODUCTION

In modern financial accounting theory, usefulness occupies a transcendent position amongst the criteria for determining the desirability of accounting reports. Accuracy, truthfulness, reliability are criteria (or perhaps alternative names for a single criterion) which have been treated as rather less important, perhaps because the 'true and fair view' of generally accepted accounting principles has been felt to be discredited. The present study is, however, rather more concerned with these qualities - termed here, verity - and consequently it is necessary to explain this concept and justify its use.

Sterling suggested that,

> 'if a message is to be useful there are two prerequisites: (1) verity and (2) relevance. If a message does not describe reality, its usefulness is, at least, severely limited.'[1]

This study adopts Sterling's notion of verity, although it places it in a rather different framework.

---

1 R R Sterling, Theory of the measurement of enterprise income (Lawrence, Kansas: University Press of Kansas, 1970), p 40.

2.2 SIMPLE AND COMPLEX ACCOUNTING REPORTS

The messages which accountants convey to external readers may be called accounting reports. The term is used at a variety of levels of abstraction: for example 'the balance sheet' may be called an accounting report, but the latter term is also used to describe particular balance sheets of particular entities at particular times. Again, the term is used at different levels of aggregation: a report may mean the statutory accounts of an entity, or the balance sheet, or a particular 'line' on the balance sheet, for example, aggregate depreciation. In this chapter a simple accounting report is one which exists at the lowest possible level of aggregation, and individual instances of reports are distinguished from general classes of such reports.

A simple accounting report consists of a label and an accounting number. Most reports are self-evidently of this form, as for example, 'Retained profit for the year: £5,000.' Other reports can be readily converted to this form, so that, for example, a report about whether an entity is a close company can be taken to consist of the label, 'close company status' and a number which can take only the values 0 (for 'not a close company') and 1. Accounting is concerned with the linkages which yield appropriate combinations of labels and numbers.

This study is based on the view that the label should specify a characteristic of some real-world object and that the linkage should be such that the number properly measures that characteristic. To put it another way, the report should make sense when read from left to right: the label should have a meaning independent of the number; the linkage ensures that the number is appropriate to the label. It is not

enough that the meaning of the label can be justified as deriving from the number and the linkage. Taking an example from Hempel,

> 'we might define the hage of a person as the product of his height in millimetres and his age in years. This definition is operationally adequate and the term "hage" thus introduced would have relatively high precision and uniformity of usage; but it lacks theoretical import, for we have no general laws connecting the hage of a person with other characteristics.'[1]

Re-expressed in the language of this chapter, the meaning of hage can only be understood from right to left; that is to say, hage does not correspond to any real-world phenomenon but is merely the result of applying the conventions implied by the stated linkage.

Left-to-right meaning is particularly important in considering complex statements, that is statements consisting of several inter-linked reports. Much the most common structure of such statements is a sequence of reports with a final report containing a number corresponding to the total of the earlier numbers in the sequence. It is taken to be important that all reports considered independently can properly be read from left to right; it is not sufficient for one or more reports to have a meaning which derives from being a total or a component of other reports.

2.3 THE MEANING OF VERITY

Sterling says that,

> 'the concept of verity may be described as "conformance with reality". A message is a verbal or symbolic

---

1 Quoted in Sterling, p 84.

> proposition which purports to say something about the "real world". If the message describes the real world faithfully, then we will say that it is "veritable"....'[1]

In this study, any assertion which is presented as an accounting report is allowed to keep that title, regardless of whether it purports to be about the real world, and Sterling's definition of verity is adapted so that a report is described as veritable if it can be demonstrated that it describes the real world faithfully. Such a definition begs the questions of whether the real world exists, what counts as the real world and what counts as faithfullness. As regards the first question, Sterling's common-sensical assumption will be followed, that is 'we will take the world to be more than just phenomena - objects will have qualities other than sense-data....'[2]

The pathway to verity is set out in figure 2.1. To be judged to be veritable an individual accounting report must clear four hurdles:

1 It must purport to be about the real world. Accounting reports which do not purport to be about the real world are fictional, or hypothetical (as in the case of a text-book example).

2 It must be capable of being about the real world; it must describe a condition which could possibly exist in the real world. In the terms used by Thomas[3] it must possess a real-world referent.

3 It must be capable of being tested. It might be argued that, in respect of classes of report, there is no worthwhile distinction to be made between the second and third tests; in other words, only statements

---

1 Sterling, p 41.

2 Sterling, p 42.

3 A L Thomas, The allocation problem: part two (Studies in Accounting Research Number 9) (Sarasota, Florida: American Accounting Association, 1974).

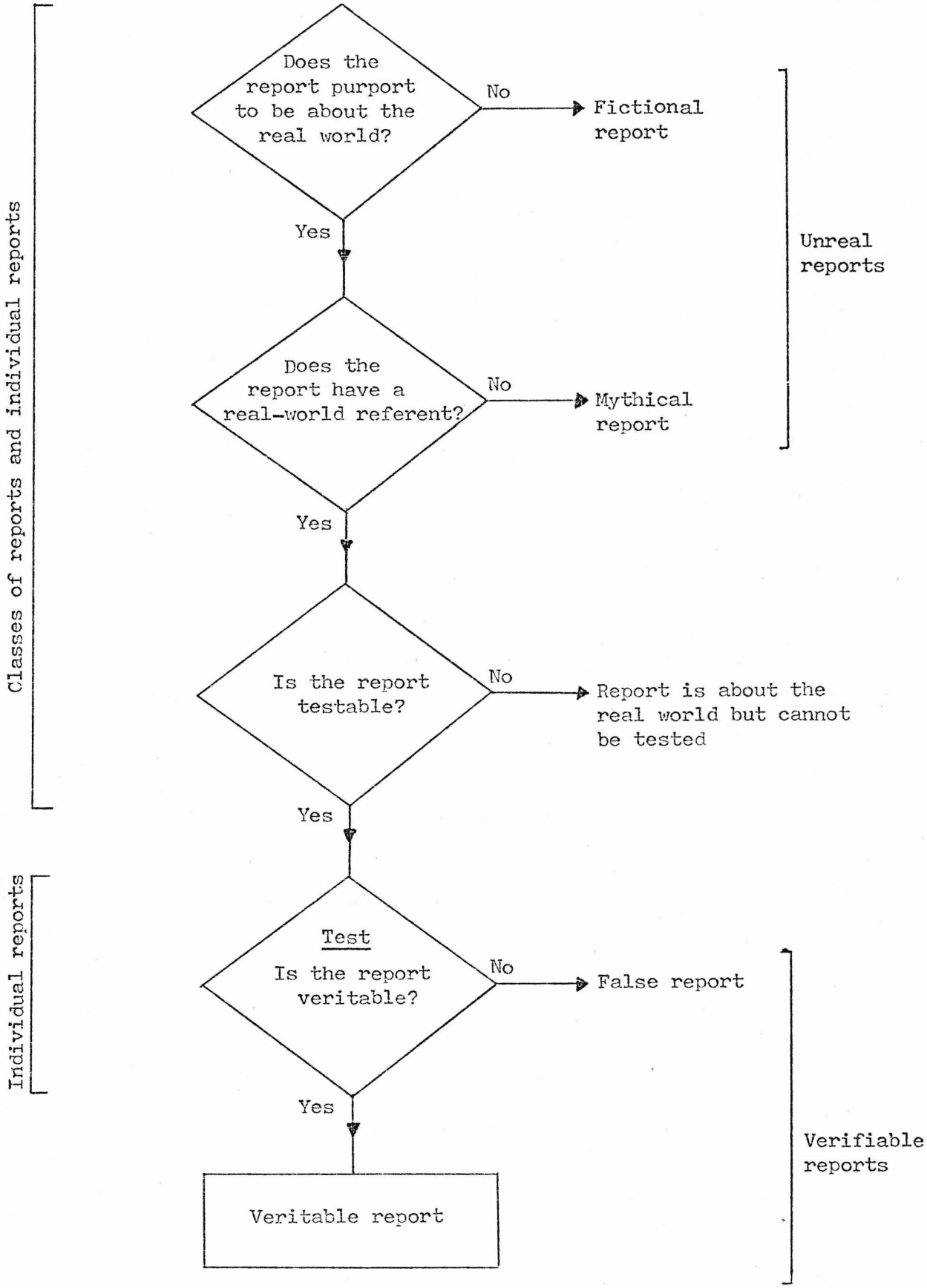


Figure 2.1: The pathway to verity

which are in principle capable of being tested can be known to be about the real world. In respect, however, of individual instances of reports it may be that they cannot be tested for quite practical reasons, as for example when the 'machinery' for testing the report cannot be provided economically, or simply was not available at the time the report needed to be tested.

4 It must actually be tested and found to be veritable.

The final hurdle can be jumped only by individual instances of accounting reports, but it is possible to lead classes of reports over the first three hurdles. This can be done because the relevant questions are asked of the general structure of the reports rather than of the particular information contained in the report. A reporting scheme or model which yields reports which pass the three hurdles will be described as veridical, that is to say, 'truth-telling'.[1]

2.4 THE VALUE OF VERITY

Amongst the other characteristics which accounting reports have, they may or may not be veritable, and they may or may not be useful. Sterling suggests that to be useful, reports must be veritable, but this view is not adopted here. Usefulness is taken to mean providing utility (directly or indirectly) to some particular individual; it is clear that reports which lack verity for whatever reason may nonetheless be useful, especially since reports are usually circulated widely. A report of directors' expectations about the future, for example, may be useful because directors 'tell the truth' about their own expectations, even though the report cannot be tested, or, even if the directors have not

---

1 See chapter 8.

told the truth, the report may be useful for the inferences which can be drawn from it. Even an operationally testable but false report may be useful to one individual, if another (who may not have witnessed a test) can be induced to believe it.

The purpose of this section is to argue that it is, in general, socially desirable that accounting reports should be veritable, and that, in the pursuit of socially desirable reports, it may be appropriate to begin by searching for reports that are veritable and then selecting useful reports from that range, rather than by seeking useful reports and then testing for verity. This is not to say that the latter approach is never acceptable, but simply that there is a place for both strategies.

The major advantages of verity are threefold. First, veritable reports can be audited in the fullest sense, and this will lead to 'the creation of rational belief and confidence in the accounting information....'[1] Auditing is what auditors do, and any competent auditor will be able to devise tests which can be applied (for a fee) to unverifiable reports, but the results of such tests will not have the same status as a test of verity.

Secondly, other criteria of usefulness are likely to be based on relationships which may not endure over time. For example, predictive ability established statistically may last for several periods and then disintegrate. Provided that all users of reports understand the implications of the relationship this may do no harm, but the nature of accountancy makes this unlikely. It is far more likely (at any rate without extensive re-education) that at least some users of accounts will

---

1 T A Lee, Company auditing: concepts and practices (London: Gee for the Institute of Chartered Accountants of Scotland, 1972), p 18.

regard the disintegration as a failure on the part of the accountancy profession. This will clearly be damaging from the point of view of the profession, and, if the profession has a contribution to make to society, it will be damaging to society as well.

Thirdly, it is generally accepted that usefulness is a criterion which can only be applied in the context of a specific individual or group. The nature of financial reporting is such, however, that it is unlikely that reports can be restricted to only those persons for whom the usefulness criterion applies. Other users may use reports for other purposes and some minimal defence of such reports is likely to be necessary if they are to remain credible. The test of usefulness cannot provide such a defence; the test of verity can. Without a minimal defence the accountancy profession may again come under attack.

Even if the value of verity in establishing desirable reporting methods is accepted, it remains to decide at what point in the procedure the tests of verity should be applied. Verity and usefulness could be pursued jointly, or either one may be established before the other is sought. Verity may, under certain circumstances, be preferable as the prior objective, since,

1 It may be easier or cheaper to demonstrate verity or the lack of it, and hence avoid the wasteful production of reporting schemes which can yield relevant information but which are not veridical.

2 Some tests of usefulness, for example polling users, have been attacked because users may be conditioned by currently available reports. A method of, at least partially, overcoming this objection would be to set out a range of veritable reports as alternatives for consideration by potential users.

3 For the want of a satisfactory test of usefulness, some other criterion

may be applied, such as political consensus. The application of such criteria may make it difficult to ensure that the test of verity is applied afterwards: consequently it may be better to ensure that selection by these methods is made from a constrained set of veritable reports.

2.5 THE SUBJECT OF THIS STUDY

For the purposes of this study the orthodox models for reporting the results of diversified operations are presumed to purport to be about the real world. The models are set out in chapter 3. The bulk of the study is taken up by an examination of whether such models pass the second hurdle described above, that is to say, whether such models have real-world referents. The question is one of logic rather than empirical enquiry. The study concludes that all variants of the orthodox model fall at the second hurdle and cannot readily be adapted to clear it.

The closing section of the study makes some suggestions about real-world phenomena relating to diversified operations which might be made the subject of veritable accounting reports.

Chapter 3

THE ORTHODOX MODEL

3.1 INTRODUCTION

The fundamental principle of the orthodoxy of financial disclosure for diversified operations can be summarised in a few words. It holds that the traditional aggregated, group or consolidated accounting numbers reported by such operations can be 'disaggregated' or broken down between operations or segments. It is sometimes accepted that a degree of interaction may exist between segments, typically by reference to 'common costs' and 'inter-segmental transfers' but it is inevitably claimed that the effects of interaction can be allocated between segments, or treated in some other way which will retain the meaningfulness of the information.

A subsequent chapter will suggest that this is not so, but first it is necessary to examine the nature of the orthodoxy in greater detail. This chapter examines a number of reporting models, including both institutional regulations and professional and academic proposals. The chapter is limited to disaggregation by activity, and does not examine disaggregation by geographical area or other criterion, nor the breaking out of specific operations such as insurance or banking. The institutional models examined are limited to those applicable to published external financial reports, and do not include, for example, statistical surveys (such as the line-of-business programme of the Federal Trade Commission in the USA),[1] or the use of information for

---

1 For an extensive discussion of the line-of-business programme, see A G Lurie, Business segments: a guide for executives and accountants (New York: McGraw-Hill, 1979), especially chapters 7 and 11. Most

purposes such as pricing (for example the Cost Accounting Standards Board's standards, again in the USA[1]).

3.2 CURRENT INSTITUTIONAL REQUIREMENTS

3.2.1 The United Kingdom

Current disclosure requirements in the United Kingdom are set out in section 17 of the Companies Act 1967, which reads as follows:

> '(1) If, in the course of a financial year, a company (being one subject to the requirements of paragraph 13A of Schedule 8 to the principal Act but not being one that has subsidiaries at the end of that year and submits in respect of that year group accounts prepared as consolidated accounts) has carried on business of two or more classes (other than banking or discounting or a class prescribed for the purposes of sub-paragraph (2) of that paragraph) that, in the opinion of the directors, differ substantially from each other, there shall be contained

---

statistical enquiries use a standard classification of industry and allocate establishments to a classification according to the principal activity of the establishment, so that subsidiary activities will be misclassified. Estimates and allocations of joint costs etc are permitted. The value of the survey relies on the proposition that errors in the data will not significantly affect the results for industrial sectors as a whole. The line-of-business programme of the Federal Trade Commission goes much further than any previous survey in the pursuit of accurate data and was held up for more than four years by extensive litigation which was finally resolved (in the Federal Trade Commission's favour) in November 1978. One of the major grounds of the litigants' case was that the 'classification basis for the [enquiry] would result in undue burden and produce information lacking in relevance and meaningfulness....' (Letter to Congressman R Eckhardt from one of the corporate attorneys, quoted in Lurie, p 114).

---

1 See, for example, F R Rayburn, 'The Cost Accounting Standards Board', The Accountant's Magazine, August 1975, pp 273-76. The Board's objectives do not encompass verity: 'The Board's primary goal for its standards is to achieve (1) more uniformity in accounting practices among government contractors and (2) consistency in accounting for costs by these contractors.' (Cost Accounting Standards Board, 'Operating policies, procedures and objectives of the Cost Accounting Standards Board', Financial Executive, July 1973, p 54).

in the director's [sic] report relating to that year a statement of -

(a) the proportions in which the turnover for that year (so far as stated in the accounts in respect of that year in pursuance of that Schedule) is divided amongst those classes (describing them); and

(b) as regards business of each class, the extent or approximate extent (expressed, in either case, in monetary terms) to which, in the opinion of the directors, the carrying on of business of that class contributed to, or restricted, the profit or loss of the company for that year before taxation.

(2) If -

(a) a company has subsidiaries at the end of its financial year and submits in respect of that year group accounts prepared as consolidated accounts; and

(b) the company and the subsidiaries dealt with by the accounts carried on between them in the course of the year business of two or more classes (other than banking or discounting or a class prescribed for the purposes of paragraph 13A(2) of Schedule 8 to the principal Act) that, in the opinion of the directors differ substantially from each other;

there shall be contained in the directors' report relating to that year a statement of -

(i) the proportions in which the turnover for that year (so far as stated in the accounts in respect of that year in pursuance of that Schedule) is divided amongst those classes (describing them); and

(ii) as regards business of each class, the extent or approximate extent (expressed, in either case, in monetary terms) to which, in the opinion of the directors of the company, the carrying on of business of that class contributed to, or restricted, the profit or loss for that year (before taxation) of the company and the subsidiaries dealt with by the accounts.

(3) For the purposes of this section, classes of business which, in the opinion of the directors, do not differ substantially from each other shall be treated as one class.'[1]

There are separate provisions of the Companies Acts dealing with the presentation of information by groups otherwise than by the preparation of consolidated accounts, and,

'a wide discretion as to form is left to the directors of the holding company subject to the overriding

---

1 Companies Act 1967, section 17.

> requirement that the group accounts show ... a true and fair view....'[1]

However, 'the vast majority of group accounts are presented in the form of consolidated accounts,'[2] and SSAP 14[3] creates a presumption in favour of this form. Consequently, the provision of segmental information by means of separate accounts for each subsidiary is not examined further here; it would not, in any event, avoid in any degree the problems discussed in this study.

There are as yet no pronouncements of regulatory or professional bodies adding to or refining the requirements set out above. The topic of 'Accounting for diversified operations' has featured in the 'Future programme' of the Accounting Standards Committee for several years but no exposure draft has been issued. In the absence of any further guidance the statutory requirement must be taken as it stands. At a number of important points it is extremely vague. In particular, there is neither a definition of what counts as a class of business nor any test of what counts as a substantial difference. Indeed, these matters are left explicitly to the opinion of the directors.

This leaves anyone who attempts to assess whether the requirements are being obeyed in a frustrating position: in the absence of a written confession, it is difficult to see what would constitute evidence that the law was being broken. Since the directors sign their report, any report

---

1 R M Wilkins, Group accounts (London: Institute of Chartered Accountants in England and Wales, 1975), p 29.

2 Wilkins, p 29.

3 Statement of Standard Accounting Practice Number 14: Group accounts (London: Institute of Chartered Accountants in England and Wales, 1978.

which does not contain an analysis by class of business must be taken as evidence that the directors do not consider that the company engaged in significantly different classes of business. Under these circumstances, the most that can be done is to show that there is some evidence that the spirit of the law is being 'avoided', and that in the absence of detailed regulations, such disclosure as does occur is confused and inconsistent. In a later chapter[1] some evidence to this effect is presented. Lamb concluded that 'a significant number of companies did not appear to comply with the statutory requirements';[2] The corporate report felt that, 'while the 1967 Companies Act requires companies to disclose the profit and turnover of substantially different classes of business, the manner in which this provision has been interpreted and applied by individual companies varies and gives room for improvement';[3] and a Green Paper on the future of company reports concluded that 'the requirement [ie section 17] has not worked well....'[4]

3.2.2 The United States of America

The disclosure of segmental information in the United States of America is governed by the Financial Accounting Standards Board and the Securities and Exchange Commission. It has recently become an area of rapid change and great confusion:

---

1 Chapter 4.

2 A F Lamb, Analysed reporting: a background study (London: Institute of Chartered Accountants in England and Wales, 1977), p 25.

3 Accounting Standards Steering Committee, The corporate report (London: Accounting Standards Steering Committee, 1975), p 58.

4 HMSO, The future of company reports (Cmnd 6888) (London: HMSO, 1977), p 13.

> 'The US Financial Accounting Standards Board has partially backed down on a requirement that companies produce segmental reports because of the practical difficulties involved.... Meanwhile the US Securities and Exchange Commission, which produces its own rules for US listed companies, is said to be planning an opposite move.'[1]

The Financial Accounting Standards Board issued a standard covering 'Financial reporting for segments of a business enterprise'[2] in December 1976, and it took effect for reports prepared for periods commencing after 15 December 1976. The standard supersedes an Accounting Principles Board Statement dated September 1967 which was intended to give 'information and assistance'[3] only.

The standard requires that the accounts of an enterprise 'shall include certain information relating to ... the enterprise's operations in different industries.'[4] Segment definition follows the earlier, 'bottom up' approach of the SEC:

> 'The reportable segments of an enterprise shall be determined by,
>
> (a) identifying the individual products and services from which the enterprise derives its revenue,
>
> (b) grouping those products and services by industry lines into industry segments ... and
>
> (c) selecting those industry segments that are significant with respect to the enterprise as a whole....'[5]

---

1 'FASB backs down', Accountants Weekly, 9 December 1977, p 6.

2 SFAS 14, title.

3 Accounting Principles Board Statement Number 2: Disclosure of Supplemental Financial Information by Diversified Companies, September 1967 (New York: American Institute of Certified Public Accountants), paragraph 14.

4 SFAS 14, paragraph 3.

5 SFAS 14, paragraph 11.

The Board considers that 'no single set of characteristics is universally applicable in determining the industry segments of all enterprises, nor is any single characteristic determinative in all cases. Consequently, determination of an enterprise's industry segments must depend to a considerable extent on the judgement of the management of the enterprise.'[1] An appendix to the statement invites managers to consider, amongst others, the following factors in exercising their judgement: the nature of the product; the nature of the production process; and markets and marketing methods. In relation to the first factor, it states that 'related products or services have similar purposes or end users.'[2] It is not clear whether this is a definition of related products, or a statement about such products. In either case, it is difficult to justify the assertion which immediately follows:

> 'Thus, they may be expected to have similar rates of profitability, similar degrees of risk, and similar opportunities for growth.'[3]

The standard allows management to use profit centres as a starting point for the process of aggregation provided that these do not cross industry lines. 'If an enterprise's existing profit centres cross industry lines, it will be necessary to disaggregate its existing profit centres into smaller groups of related products and services.'[4] This seems to mark a reversion to the 'top down' method of segment definition - that is, to the view that the operations of a business (or part of a business, in this case a profit centre) can be divided up into segments without reference to any underlying units. Taking paragraphs 11 and 13 together,

---

1 SFAS 14, paragraph 12.

2 SFAS 14, paragraph 100.

3 SFAS 14, paragraph 100.

4 SFAS 14, paragraph 13.

however, it may be that the decision about whether a profit centre crosses industry lines would have to be made by reference to individual products or services.

Industry segments' results need only be disclosed if they are material, or if disclosure is necessary to achieve a segmental breakdown of a sufficiently large proportion of total results. If the number of segments passing the materiality test grows too large, some segments may be grouped together. Interestingly, whereas the instructions for grouping products and services by industry lines occupy only three paragraphs, the instructions for selecting reportable segments from the resultant groupings - surely a subsidiary issue - extend to seven paragraphs.

For each reportable segment and for the rest of the group's operations taken together, there must be disclosed information about revenue, profitability, identifiable assets and 'other related disclosures', together with 'the types of products and services from which the revenue of each reportable segment is derived'[1] and relevant accounting policies.

As far as sales are concerned, sales to third parties and to other segments should be shown separately. Internal sales should be 'accounted for on the basis used by the enterprise to price [them].'[2] The basis should be disclosed, and the effect of a change from period to period should be quantified.

Operating profit is struck after 'those operating expenses incurred by an

---

1 SFAS 14, paragraph 22.

2 SFAS 14, paragraph 23.

enterprise that are not directly traceable to an industry segment [have been] allocated on a reasonable basis among those industry segments for whose benefit the expenses were incurred,'[1] but before general corporate revenue and expenses, interest, income taxes and extraordinary items. Allocation bases should be applied consistently and changes should be disclosed. Other measures of profitability may also be disclosed in addition to operating profit.

A major innovation is that 'the aggregate carrying amount of identifiable assets ... shall be presented for each reportable segment.'[2] Identifiable assets include tangible and intangible assets but exclude loans to other segments. 'Assets used jointly by two or more industry segments shall be allocated among the industry segments on a reasonable basis.'[3]

The standard also requires the disclosure by segment of the depreciation charge, capital expenditure, the results of investment accounted for on the equity basis, and the effect of changes in accounting policies. Segmental information is required to be reconciled to group accounts.

Subsequent statements (backdated to the implementation of SFAS 14) have amended the Financial Accounting Standards Board's requirements, so that segmental reports are not now required to be included in interim accounts[4] or the accounts of 'nonpublic enterprises' (ie enterprises without any form of publicly traded capital).[5]

---

1 SFAS 14, paragraph 10, emphasis added.

2 SFAS 14, paragraph 26.

3 SFAS 14, paragraph 10, emphasis added.

4 Financial Accounting Standards Board Statement of Financial Accounting Standards Number 18: Financial Reporting for Segments of a Business Enterprise - Interim Financial Statements, November 1977 (Stamford, Connecticut: Financial Accounting Standards Board).

5 Financial Accounting Standards Board Statement of Financial Accounting

The main standard has not been in operation long enough to reach any firm conclusions about its effectiveness.[1] Business Week reported a preliminary impression:

> 'Now, for the first time, investors can more easily compare domestic and international operations among companies. They can also trace intercompany transactions among different geographical sectors. But as with other segment information, there was considerable variation in presentation this year.'[2]

Prior to the introduction of SFAS 14, the Securities and Exchange Commission imposed its own requirements in respect of segmental disclosure.[3] It has now adopted regulations to the effect that registrants must comply with SFAS 14.[4] The earlier requirements do not avoid any of the problems associated with SFAS 14.

3.2.3 Canada

The Canada Corporations Act 1965, which regulated company affairs throughout Canada, required that where a group engaged in 'business of two or more classes that, in the opinion of the directors, differ substantially from each other'[5] it should disclose segmental turnover

---

Standards Number 21: Suspension of the Reporting of Earnings Per Share and Segment Information by Nonpublic Enterprises, April 1978 (Stamford, Connecticut: Financial Accounting Standards Board).

---

1 For a discussion of some of the results of one of the first statistical surveys, see chapter 4.

2 'More annual confusion', Accountancy Age, 28 April 1978, p 13.

3 For a description of the requirements, see Lamb, pp 18-20.

4 For details of the regulations, see Lurie, pp 125-28.

5 Canada Corporations Act 1965 (Canada), section 122.1.

(if material) but not profit. As in the United Kingdom, segmental definition was a matter of managerial discretion. This position was unsatisfactory and the Canada Business Corporations Act 1975 attempted to tighten up the requirements. Regulations under the Act require that the directors determine the basis of the classes in a meeting and record them in the minutes, and that the directors should either use the Canadian Standard Industrial Classification Code as the basis of segmentation, or describe the basis adopted.[1]

The information required to be disclosed under the new Act is 'a summary of financial information for each class of business the revenue from which is 10 per cent or more of the corporation's total revenues for the period.'[2]

The Canadian Institute of Chartered Accountants has issued recommendations concerning the disclosure of turnover, profit and balance sheet information.[3] It considers that 'the basis of segmentation should generally be the industries in which the enterprise operates.'[4] Industries is taken to mean 'broad industrial groupings',[5] rather than particular classifications in a statistical scheme. Segmental sales should be disclosed at a minimum. It is recognised that 'extension of segmentation to net income may involve the arbitrary allocation of common costs to segments.'[6] However common costs are defined as costs 'usually incurred for the benefit of the enterprise as a whole.'[7] The recommended

---

1 Canada Business Corporations Act 1975 (Canada), section 47.

2 Canada Business Corporations Act 1975 (Canada), section 47.

3 See section 1700 of the Canadian Institute of Chartered Accountants Handbook (Toronto: Canadian Institute of Chartered Accountants, 1971). Extracts of the text are reprinted in Lamb, and subsequent page references are to this source.

4 Lamb, p 105.

5 Lamb, p 105.

6 Lamb, p 106.

7 Lamb, p 106.

disclosure of segmental profitability is by means of segment margins which 'are calculated by assigning to each segment the sales or gross revenue and costs which are applicable to the particular segments and by excluding common costs.'[1]

The recommendations go on to say that 'it may sometimes be necessary to assign prices to sales, purchases or other transactions occuring between segments. It is usually appropriate to provide a summary of the method of pricing transfers within an enterprise, to aid in an assessment of the fairness of information as to the profitability of segments.'[2] Segmental balance sheet and funds flow information should, the recommendations say, be supplied, 'where it is meaningful and readily available.'[3]

3.3 SOME PROPOSED MODELS

3.3.1 Mautz

Mautz[4] conducted research into segmental disclosure, 'for the purpose of making recommendations to interested parties respecting whether disclosure is desirable and, if so, the kinds and extent of such disclosures.'[5] At the centre of the research were two attitude surveys.

---

1 Lamb, p 106.

2 Lamb, p 108.

3 Lamb, p 108.

4 R K Mautz, Financial reporting by diversified companies (New York: Financial Executives Research Foundation, 1968).

5 Mautz, p 161.

The first was of financial analysts, selected 'to represent the views of all those who read and rely on reported corporate financial data',[1] and the second, of companies themselves. The research can be seen as an attempt to compromise between what the analysts demanded and what the companies were prepared to disclose. This is indicated, for example, in Mautz's conclusion:

> 'The difference in viewpoint between the most reluctant corporate representative and the most demanding financial analyst was an extreme one. The views of more moderate financial executives and financial analysts appear reconcilable.'[2]

In his discussion of the problems of segmental disclosure, Mautz argued that, 'because of common cost allocations and intra-company pricing, data prepared for management purposes could be misleading if supplied to others who are less well acquainted with the company and who may not know the purpose for which the information was prepared.'[3] However, he considered that 'the relative importance of common costs in segment reporting tends to decrease as the breadth of the reporting segments is increased,'[4] and that 'disparate components [ie segments] may have so few intra-company transactions and such a small proportion of common costs that these present no serious deterrent to the presentation of operating data for such components.'[5] By common costs Mautz meant 'costs common to two or more reportable components of a diversified company.'[6]

---

1 Mautz, p 146.

2 Mautz, p 151, emphasis added.

3 Mautz, p 147.

4 Mautz, p 147.

5 Mautz, p 147.

6 Mautz, p 147.

As a result of the survey of analysts, Mautz concluded that:

> 'Analysts are aware that common costs present significant allocation problems and a majority agree that the allocation of such costs to organisational units or to products may be misleading. Most of those responding indicated that the point at which segment profit figures lose their significance because of the influence of common costs is 10% of sales or less, and relatively few felt results were reliable which included common cost allocations in excess of 20% of sales. Similar questions concerning intra-company sales brought similar answers....
>
> In those cases in which common costs or intra-company pricing are sufficient to destroy the significance of segment net income figures for analytical purposes, a substantial number of analysts indicated they would find useful a "defined profit" which is computed by subtracting direct expenses of the segment from segment sales....
>
> No clear preference for one basis of common cost allocation versus other possibilities was indicated.'[1]

Based on his findings, Mautz recommended that,

> '... management should determine the number and scope of a diversified company's reporting components and report the activities of those components within the following guidelines:
>
> A Identify and describe the components which are subject to separate reporting.
>
> B Disclose any significant changes from the previous period in the composition of the reporting components.
>
> C For each reporting component:
>
> 1 Disclose sales or other gross revenue.
>
> 2 Disclose the relative contribution made by each component to the income of the enterprise. The contribution to income made ~~made~~ by each component may be calculated before or after the allocation of common or corporate costs but in any case should be clearly described. In the event of a change in the method of computing or reporting either gross revenue or the relative contribution to income of the reporting components, the change should be clearly described.
>
> D If the method of pricing intra-company transfers or allocating common or corporate costs significantly affects the reported contribution to income of the

---

1 Mautz, p 152.

reporting components, the method used should be disclosed in general terms similar to the following:

1 "Corporate expenses were allocated to the reporting components on the basis of a formula giving approximately equal weight to assets employed, sales and number of employees."

2 "Intra-company transactions are priced at close approximations of open market prices for similar products and services."'[1]

3.3.2 The American Accounting Association

A subcommittee of the Committee on Financial Accounting Standards of the American Accounting Association issued a report[2] to the Financial Accounting Standards Board, in connection with the Board's efforts to produce the accounting standard described in section 3.2.2.[3] The committee suggested that 'the primary form of presentation would customarily be by lines of economic activity, usually by products but sometimes by regions of sales or production.'[4] It argued that 'management should have the responsibility for selecting the segments to be reported, but the attesting accountant also has the resposibility to review such segmentation.'[5] In the view of the committee, 'the segments selected should provide the best measures of differing prospects for profits and growth and for indicating risk.'[6] The committee went on to suggest that 'the attesting accountant should be satisfied this is the case',[7] although it conceded that 'satisfactory criteria to guide

---

1 Mautz, p 158, emphasis supplied.

2 American Accounting Association, Report to the Financial Accounting Standards Board from the Subcommittee on Financial Accounting Standards (Sarasota, Florida: American Accounting Association, 1974).

3 pp 27-32.

4 American Accounting Association, p 4.

5 American Accounting Association, p 4.

6 American Accounting Association, p 4.

7 American Accounting Association, p 4.

the attesting accountant are not now available.'[1]

As far as inter-segmental transactions are concerned, the committee suggest that,

> 'The amount of intra-firm transfers should be shown either on a separate line or by footnote. Management should be free to determine the most appropriate method of pricing intra-firm transfers; the method used for pricing intra-firm transfers for internal reporting purposes will also usually be satisfactory in presenting the segment income statements. The method of pricing intra-firm transfers should be disclosed in the segment reports. Where a major portion of a segment's sales (say, 50% or more) represent transfers to other segments of the firm there is a substantial doubt that such an activity should be viewed as a separate segment.'[2]

The proportion of sales made internally which the committee regards as invalidating segmental data is remarkably high, compared to the values discussed by Mautz.

Turning to the problem of common costs, the committee recommend that 'the income to be reported should be income before common costs and interest.'[3] Expanding this argument, the committee say,

> 'Common costs which are not ascribable to individual segments should not be allocated to segments. Only costs which are ascribable should be allocated. Hereafter, the term common costs will be used only to refer to nonascribable costs. Corporations may allocate such common costs if they desire, but even in this case they should report income before common costs and interest. The Statement should permit, but not require, a corporation to fill in the common costs line in the format suggested elsewhere in the report. If this is done, a column for unallocated costs may need to be added since the corporation may not be able, or may not wish to allocate all common costs. If common costs are allocated, the basis for doing so should be disclosed.'[4]

---

1 American Accounting Association, p 4.

2 American Accounting Association, p 5.

3 American Accounting Association, p 5.

4 American Accounting Association, p 6.

Unfortunately, the committee do not define what they mean by an ascribable cost, nor do they suggest how such costs might be identified.

3.3.3 Lamb

Lamb's research included a series of recommendations which 'agree, in general terms, with the approach taken in the FASB exposure draft.'[1] He modified the model, however, to take account of UK conditions. He agreed that, amongst other analysed reports, there should be an analysis between 'industries' or 'lines of business'.[2] He considered that 'the management of the company should be responsible for determining a meaningful analysis by line of business and ... they should use their discretion as to how best to achieve this.'[3] He rejects the use of the Standard Industrial Code, but considers that the directors should explain the basis they have employed. He suggests that guidelines as to appropriate criteria for determining segmentation should be included in a standard, and that the following would be suitable:

> 'The reader of accounts will wish to be informed of those lines of business which:
>
> (a) earn a profit or incur a loss which is significantly out of line with the remainder of the business; or
>
> (b) are subject to different degrees of risk; or
>
> (c) have different future potentials; or
>
> (d) have experienced different rates of growth from other parts of the business.'[4]

---

1 Lamb, p 62.

2 Lamb, p 65.

3 Lamb, p 35.

4 Lamb, p 38.

Lamb did not consider that 'vertically integrated' operations should be treated as separate segments and suggested that an appropriate test would be that 'if, say, 20% or more of the sales of one activity were made to another activity of the same company, then those activities should be regarded as being vertically integrated'.[1] He went on to say that,

> 'It seems to us that the problems regarding transactions between different lines of business may be overstated if our suggested guidelines for what are to be regarded as "different lines of business" ... are followed....
>
> We suggest that sales from one line of business to another should be disclosed separately in the statement of analysed information (if they are significant) for the reasons explained in the last section of paragraph 115. However, a standardised basis of pricing such sales is unlikely to be practicable in the different circumstances in which companies operate. Accordingly we suggest that the basis of pricing adopted should be that used by the company for its internal accounting, that details of the basis should be disclosed and that the effect of any variations from year to year should also be disclosed. We also suggest that the auditors be asked to comment if in their view the basis adopted is unsatisfactory.'[2]

It goes almost without saying that no criterion for what counts as an 'unsatisfactory' basis is given.

Lamb divides common costs into head office expenditure, interest and other common costs. He suggests that head office expenditure 'should be shown separately ... and ... not allocated to individual lines of business.'[3] His treatment of the meaning of head office expenses is rather confused. In an introductory paragraph he writes,

> 'Most companies incur expenditure at their head offices in running the affairs of the company as a whole. In some companies in which common functions are dealt with centrally, for example, central purchasing, credit

---

1 Lamb, p 66.

2 Lamb, p 67.

3 Lamb, p 67.

> control or sales departments, expenditure at head office may be substantial. Some companies allocate such head office expenditure to individual lines of business by way of a management charge.'[1]

There is a confusion here between the budget centre making the payment and the profit centre which receives the benefit. Not all expenditure incurred at head office will benefit the company as a whole, and some of the 'common functions' which Lamb describes may benefit some, but not all, segments. Some head office expenditure, of course, may benefit only one segment. This should clearly not be treated as a common cost.

In his recommendations, Lamb is prepared to allow management discretion to allocate head office expenses, provided that the basis used is 'compatible with the objectives of presenting analysed information'.[2] It may be assumed that the objectives mentioned follow those of the FASB exposure draft mentioned earlier, that is, 'to assist financial statement users in analysing and understanding the enterprise's financial statements by permitting better appraisal of the enterprise's past performance and future risks and prospects.'[3] No test of compatibility with these objectives is offered by Lamb.

Interest should not, according to Lamb, be allocated to segments for the following reasons:

> '(a) The credit rating and therefore interest rate payable on borrowings depends on the financial standing of the company as a whole and not the individual lines of business. Accordingly, the interest rates payable by the individual line of business may not reflect the interest rates that it would pay if it were to borrow as a separate entity and, therefore, the interest charged against individual lines of business may be misleading.

---

1 Lamb, p 43.

2 Lamb, p 68.

3 Financial Accounting Standards Board Proposed Statement of Financial

(b) The decision as to the most appropriate financing arrangements for each line of business is often under the control of the central administration rather than the individual lines of business. Accordingly, although a particular source of finance may be identified with a particular line of business, for example a debenture stock issued on the acquisition of a subsidiary, this may be more a matter of management policy than a fact relevant to the determination of the results of that line of business.

(c) Interest payable on total company borrowings could only be arbitrarily allocated to individual lines of business. Accordingly, management might be in a position to manipulate the basis of allocating interest so that the analysed information is presented on the most favourable basis.

(d) If all interest is allocated, then difficulties would arise in allocating interest to acquisitions, particularly when some acquisitions are made wholly or partly for shares. How this allocation is made may significantly change the earnings attributable to the individual businesses.'[1]

Costs 'which are directly related to the lines of business of a company but which relate to more than one of those lines of business'[2] should, in Lamb's view, be allocated on a basis 'consistent with achieving the objectives of analysed information.'[3] Again, no test of compatibility is offered.

Lamb recommends the presentation of an analysis of 'working capital (ie fixed assets plus net current assets but excluding liquid assets and liquid liabilities) by line of business',[4] but does not consider it necessary to provide a segmental funds statement.

Accounting Standards: Financial Reporting for Segments of a Business Enterprise, September 1975 (Stamford, Connecticut: Financial Accounting Standards Board), p 2.

---

1 Lamb, pp 44–45.

2 Lamb, p 68.

3 Lamb, p 68.

4 Lamb, p 69.

Chapter 4

A SURVEY OF CURRENT UK REPORTING PRACTICE

4.1 RESEARCH DESIGN

The companies whose accounts are examined in this chapter comprise a sub-sample of a sample containing:

1 The two hundred largest UK quoted companies (ranked by turnover) in the Times 1000 of 1974/75[1] which survived into the second half of 1975.

2 Other members of the top 200 companies in the Times 1000 ranked by capital employed and profit which satisfied the same conditions.

On this basis, the sample contained 220 companies. The sub-sample contains those companies which issued accounts for periods ending between July and December 1974. This sample originally contained 129 companies (59% of the total) but one company failed to respond to three requests for its accounts and has been eliminated from the sample, making a final total of 128 companies. The distribution of year-ends is given in table 4.1.[2]

As an indication of the breadth of the sample, an industrial classification is given in table 4.2. The classification employed follows that used by The Economist in its list of share prices: in 63% of cases the companies in the sample actually appear in the list and the classification given by The Economist is followed; the remainder are classified according to information given in the accounts. The classifications are broad and indicate a company's main activity only, hence the appearance of companies in particular headings should not be taken to mean that they are not diversified. One bias which results from surveying only a

---

1 M Allen (ed), The Times 1000 (London: Times Newspapers, 1974).

2 The companies are listed in appendix 4.1.

Table 4.1

Company year-ends

Year-end	Number of companies	Percentage
July	2	1.6
August	4	3.1
September	28	21.9
October	7	5.5
November	1	0.8
December	86	67.1
	128	100.0

Table 4.2

Industrial classification

Classification	Number of companies	Percentage	Distribution of original sample
Breweries, other drink	4	3.1	3.1
Building, building materials	18	14.1	12.6
Catering, hotels, entertainment	4	3.1	2.7
Chemicals	5	3.9	3.1
Electrical, electronics	5	3.9	4.5
Engineering, shipbuilding	12	9.4	9.0
Food, pharmaceuticals	10	7.8	9.5
Insurance	3	2.3	1.8
Mines, metals	8	6.3	4.5
Motors, aerospace	8	6.3	3.6
Multiproduct, miscellaneous	24	18.7	20.7
Office equipment, photographic	3	2.3	1.4
Oil	4	3.1	2.3
Paper, publishing	6	4.7	4.1
Property	1	0.8	0.5
Stores	1	0.8	8.5
Textiles	4	3.1	3.1
Tobacco	2	1.6	1.4
Transportation	6	4.7	3.6
	128	100.0	100.0

six month period is that stores are heavily under-represented: most have year-ends between January and March. With this exception, the use of a six month period does not seem to have introduced any major industrial bias.

The flexibility which is permitted in segmental reporting in the UK makes it rather difficult to establish a 'cut-off point between what is and what is not a segmental analysis. The following criteria have been employed for the purposes of this survey:

1 Any tabulation or graphical or narrative presentation is treated as a segmental analysis provided that it is systematic, that is, it covers all parts of the organisation and agrees with the main accounts.

2 Analyses of turnover and profit between different markets or geographical destinations of output are not treated as segmental analyses unless they also correspond to different products, activities or divisions of the group and are stated to do so. However, when an analysis is given partly by market and partly by product, activity or division, it is treated as a segmental analysis on a mixed basis.

3 Many companies combine geographical and activity segments in a single statement. For the purpose of classifying such statements, as many geographical segments as possible are aggregated to form homogeneous activity segments, but it is not always possible to eliminate all geographical segments in this way, and those that remain are treated as separate segments of an activity analysis. For example, consider the following analysis:

i Activity A - UK.

ii Activity A - Overseas.

iii Activity B - UK.

iv Other activities - Overseas.

This would be treated as both an activity and a geographical statement.

As an activity analysis, classes (i) and (ii) would be added together to form a total for Activity A; thus the activity analysis would be regarded as having three classes and the basis of segmentation would be treated as 'activity-geographical'. As a geographical analysis, the breakdown would be regarded as having only two classes, since the only geographical analysis possible is between UK and overseas.

4.2 THE EXTENT OF DISCLOSURE

4.2.1 The identification of companies which ought to disclose segmental information

The fundamental empirical distinction required for the interpretation of the data provided by this survey is clearly that between diversified and unitary companies. As pointed out earlier,[1] this distinction is by no means easy to make in practice. The question of whether a company's business is of two or more substantially different classes turns round the opinion of the directors. Since directors who reach the conclusion that their business is of one class (or of several classes which do not differ substantially from each other) are not required to say so, it is not possible to say whether that conclusion has been reached or whether the legislation is being ignored. Furthermore, it is not possible to say, at any rate by reference only to the accounts themselves, whether the directors have followed the 'spirit' of the Act in reaching any opinion.

On the other side of the coin, publication of an activity breakdown might, in principle, be a gratuitous disclosure by a unitary company of information for classes of business which do not differ substantially.

---

1 See pp 26-27.

Under these circumstances it is very difficult, even by appealing to evidence outside the accounts, to show that the statutory requirements are not being met. What is possible is to suggest, albeit tentatively, that companies are not complying with the 'spirit' of the legislation; that they are avoiding its provisions.

4.2.2 Geographical analyses

Although the question of segmental analysis based on geographical area falls outside the scope of this study, some limited data for geographical analyses is given in this section, for comparative purposes. The information is provided in accordance with paragraph 9(b) of the Stock Exchange Listing Agreement, which requires companies to circulate with the directors' report,

> 'A geographical analysis of turnover and of contribution to trading results of those trading operations carried on by the company (or group) outside the United Kingdom.'[1]

4.2.3 The incidence of segmental information

Tables 4.3 to 4.5 summarise the incidence of segmental information. Only a very small number of companies (6 or 5%) gave no segmental information at all, but a rather larger number (29 or 23%) gave only a geognaphical analysis. Hence the number of companies lacking an analysis by activity amounted to 35 (27%). As the tables show, the extent and range of

---

1 Stock Exchange, Admission of securities to listing (Revised edition; London: The Council of the Stock Exchange, 1979, updated from time to time), p 32.

Table 4.3

The incidence of segmental information: summary

Information provided	Number of companies	Percentage
Activity and geographical analyses	74	57.8
Activity analysis only	19	14.8
Geographical analysis only	29	22.7
No analyses	6	4.7
	128	100.0

Table 4.4

The incidence of segmental information by range of information provided

Information provided	Activity analyses	Geographical analyses
Turnover and profit	66	62
Turnover, profit and -		
Net assets	8	6
Net assets and employees	1	1
Employees only	1	
Capital expenditure and employees		1
Matrix by activity and area -		
Turnover only	1	1
Turnover and profit	1	1
Capital expenditure	1	
R and D expenditure	1	
Net assets and capital expenditure		1
Full profit and loss account		1
Sites	1	
Turnover only	6	22
Turnover and net assets		1
Profit only	3	2
Fixed assets, capital expenditure and turnover (units)	1	
Turnover (units) only	1	
Production (units) only	1	1
Employees only		1
Turnover (units) and production (units)		1
Order book only		1
	93	103

Table 4.5

The incidence of segmental information by types of analysis provided

Information provided	Companies providing:			
	Activity analysis only	Geographical analysis only	Activity and geographical analyses:	
			Activity analysis	Geographical analysis
Turnover and profit only	15	18	51	44
More than turnover and profit	3		12	12
	18	18	63	56
Turnover only		11	6	11
Turnover and other information (excluding profit)				1
Profit only			3	2
Other information only	1		2	4
	19	29	74	74

information varied considerably, although the combination required by the relevant regulations, namely turnover and profit only, predominated.

An interesting aspect of the tables is the extent of asymetrical disclosure, that is disclosure of turnover or profit but not both. Table 4.5 shows that in the case of activity analyses, six companies showed turnover but not profit and three showed profit but not turnover; in the case of geographical analyses, 22 companies showed turnover but not profit and two showed profit but not turnover. In addition three companies showed 'non-statutory' information by activity and four showed such information by geographical area without providing either turnover or profit. It is possible that this imbalance occurs because companies which have classes of business which are sufficiently different to permit disclosure of turnover or profit or other information do in fact disclose this information gratuitously, whereas the classes are not significantly different and therefore do not need to have both turnover and profit disclosed. However, it seems likely that there is at least an element of avoidance here.

4.2.4 Companies which did not provide activity analyses

Of the 128 companies in the survey, 47 (37%) did not provide the statutory information required of diversified companies. This figure is analysed in table 4.6, and an industrial classification of companies providing neither turnover nor profit information is given in table 4.7. Whilst it is not possible to draw any firm conclusions about why segmental information was not provided, in view of the problems discussed earlier,[1] the number of companies not providing any activity breakdown does seem rather high,

---

1 pp 47-48.

Table 4.6

Companies not providing statutory activity analyses

Information provided	Number of companies
Neither activity nor geographical analyses	6
Geographical analysis only	29
No activity analysis	35
Non-statutory activity analysis only	3
Neither turnover nor profit by activity	38
Turnover only/Turnover and other information but not profit	6
Profit only/Profit and other information but not turnover	3
Total	47

Table 4.7

Industrial classification of companies providing no activity analysis

Classification	Companies giving no analysis:	
	Number	As percentage of sample companies in the classification
Breweries, other drink	3	75.0
Building, building materials	9	50.0
Chemicals	2	40.0
Electrical, electronics	4	80.0
Engineering, shipbuilding	3	25.0
Food, pharmaceuticals	3	30.0
Insurance	1	33.3
Mines, metals	1	12.5
Motors, aerospace	3	37.5
Office equipment, photographic	2	66.7
Oil	3	75.0
Paper, publishing	1	16.7
Textiles	3	75.0
All industries	38	29.7

Note: In the following classifications, all companies provided activity analyses: Catering, hotels, entertainment; Property (one company only); Stores (one company only); Tobacco; Transportation; Multiproduct.

in view of the nature of the sample, which was drawn from amongst the largest companies in the UK.

Of the 38 companies giving neither turnover nor profit by segments, in only seven cases did the directors explicitly state that they considered their business to be of one class - although of course they are not required to do so. Twenty-four companies of the 38 gave either a review of operations, an organisation chart or a list of subsidiaries classified on a functional or divisional basis. In one case the directors stated that they 'consider[ed] that the products of the Group [were] of one class', yet further in the report they provided an unquantified pie diagram dividing 'turnover by product' between five groups. Another company showed a 'group organisation' chart dividing its UK operations between three goups and 12 divisions on a product basis, yet on the next page the directors stated that they regarded the group's products as comprising a single class.

Many companies provided qualitative data on the results of different divisions, which, presumably, were based on internal accounting reports. One such company reported on 12 UK divisions, describing their performance in tems such as 'satisfactory', 'very successful' and 'excellent', yet no quantification was offered in the published report. In several cases there was evidence of selective reporting: for divisions which had clearly done well, the report concentrated on turnover, profit and cash flow - perhaps even quantifying one or more of these. For divisions which had done less well, the report concentrated on new investment, reorganisations, future prospects, and, in extremis, divestment. Few divisions were described as making losses, or even reduced profits: key words were

'disappointing' and 'unsatisfactory'. Whilst informed (and cynical) investors may be able to draw useful inferences from such evidence, this cannot be regarded as a sensible state of affairs.

Although the numbers in each category are small, the industrial classification of 'non-providers' (table 4.7) suggests that there is a relationship between industrial classification and disclosure. Non-disclosure was more than twice as common than the overall average in brewing, elctrical and electronics, office equipment, oil and textiles. The oil industry is, of course, highly vertically integrated, and there is clearly a limit to the amount of segmental information that can be provided by companies under these circumstances; however it is worth noting that one company did break out its non-oil activities, and one company provided details of turnover, but not profit, between oil, chemicals and metals. Additionally two companies gave gratuitous disclosures on a segmental basis including sales (units), assets and capital expenditure.

The brewing industry is well-known for its failure to disclose segmental analyses. The Times commented:

> 'In [a recent offer document] Whitbread vouchsafed information never before officially divulged - namely ... wine and spirit turnover [as a percentage of total sales]. But it seems likely that the forthcoming annual report will say nothing further.... Whitbread is not alone.... To take a single, but by no means untypical example, Bass in 1973 acquired the Esso Hotels in Europe for £25m. Little has been said subsequently as to the success of this move on the grounds that those in the United Kingdom have been integrated with the rest of the Bass chain here and can no longer be picked out. But has it been a profitable exercise?'[1]

---

1 'The pressure for more disclosure by brewers', Times, 22 July 1975, p 19.

The Bass chain of hotels in the United Kingdom is not itself reported separately from the group's other activities. The speculation of the Times about the contents of Whitbread's annual accounts proved to be well-founded.

Of the four brewing groups included in the survey, one provided an analysis broken down between five activities. The remaining companies listed activities including brewing and bottling beer, manufacture of wines, spirits, soft-drinks, fruit juices, sherry and port, wholesaling and retailing, catering, hotel-keeping and property development, but did not provide any segmental analyses.

4.3 BASIS OF ACTIVITY SEGMENTATION

The multiplicity of descriptions employed by companies to describe their segments makes classification of alternative bases difficult. As explained earlier,[1] wherever possible analyses were treated as functional, ie based on products or activities. Thus an analysis by division, where each division is - or, on the evidence of the accounts, appears to be - functionally different is treated as functional. Only the residue of analyses which could not be treated as functional were classified as being on some other basis. The results are shown on table 4.8. On the assumptions given, 88% of both turnover and profit analyses could be regarded as falling strictly within the definition required by law.

---

1 pp 46-47.

Table 4.8

Basis of segmentation

Basis	Analyses of turnover	Analyses of profit
Product/Activity	76	73
Division/Subsidiary (other than functional)	1	1
	77	74
Mixed:		
Product-geographical	6	6
Product-division	1	1
Market-geographical	1	1
Product-division-geographical	1	1
	86	83

Note: One company included in tables 4.4 and 4.5 presented separate accounts for one segment and is excluded from this and subsequent tables.

4.4 SIZE AND NUMBER OF SEGMENTS

4.4.1 Size of largest segment

If segment disclosure is to constitute a meaningful addition to the information content of annual reports it is clear that it should not take the form of an analysis using one very large segment representing almost all the organisation, and one or more insignificant segments. For the purpose of determining size in this context, turnover seems to be the only suitable measure since profit will not be appropriate, and other measures such as assets and employees are not normally available broken down by segment.

Table 4.9 shows the distribution of analyses by the contribution to turnover of the largest segment. Twenty-one companies (24%) gave segmental analyses in which the largest segment contributed more than 70% to the group's turnover; of these, eight reported segments contributing in excess of 90%, and the largest contribution reported was larger than 96%. It is difficult to see what useful addition to the information available in a set of accounts is made by segmentation of this sort: firms which report analyses of this sort are either unitary, or they are avoiding the disclosure requirements.

4.4.2 Size of smallest segment

In the context of segmental reporting, excessive disaggregation must be a lesser evil than insufficient disaggregation, since disaggregated data can usually be reaggregated by a sophisticated user, although this

Table 4.9

Percentage contribution to turnover of largest segment

Contribution	Number of analyses
70% and below	65
- 80%	9
- 90%	4
- 100%	8
	86

Table 4.10

Percentage contribution to turnover of smallest segment

Contribution	Number of analyses	Cumulative percentage
1% and below	17	19.8
- 4%	21	44.2
- 9%	29	77.9
- 14%	6	84.9
- 15%	3	88.4
- 19%	2	90.7
- 24%	5	96.5
- 29%	1	97.7
Over 29%	2	100.0
	86	

Note: The irregular class intervals are necessary to facilitate comparison with Mautz's data (see text).

will not necessarily be possible if, for example, insufficient information is given about internal sales. Nonetheless the danger of information overload suggest that segments making only small contributions to group turnover should not be separately disclosed (unless they are unusual in some other respect). Table 4.10 provides an analysis of the size of the smallest segment disclosed in each activity breakdown of turnover. The financial analysts questioned by Mautz[1] gave quite precise data on their requirements concerning the minimum size needing separate disclosure, and most of the companies in the sample violated these. All but one of the 220 analysts responding to Mautz's questionnaire considered that segments contributing 4% or less to turnover should not be separately disclosed, yet 44% of the companies in the sample reported at least one segment falling in that category; 84% of analysts went further and said that segments contributing 9% or less should not be separately disclosed, yet 78% of companies reported at least one segment in that category.

Whilst it is accepted that the analysts' requirements and UK practices are not directly comparable for a number of reasons, there is surely some force in the comparison: it is rare in financial reporting for three-quarters of information providers to be giving information which three-quarters of users have said they do not require.

4.4.3 Number of segments

The number of segments reported in each analysis is given in table 4.11. There is no great difference between the distributions for turnover and

---

1 R K Mautz, Financial reporting by diversified companies (New York: Financial Executives Research Foundation, 1968), chapter 4; and see this study, section 3.3.1.

Table 4.11

Number of segments in analysis

Number of segments	Turnover analyses:		Profit analyses:	
	Number of analyses	Cumulative percentage	Number of analyses	Cumulative percentage
2	7	8.1	6	7.2
3	16	26.7	16	26.5
4	22	52.3	19	49.0
5	21	76.7	22	75.9
6	5	82.6	6	83.1
7	5	88.4	5	89.2
8	2	90.7	1	90.4
9	3	94.2	3	94.0
10	1	95.3	1	95.2
11	2	97.7	2	97.6
12		97.7		97.6
13	2	100.0	2	100.0
	86		83	

profit, and the comments in this section are based on the data for turnover. Seven companies (8%) provided data for only two segments, and the contribution to turnover of the larger of the two segments amounted to over 70% in all cases, and to over 90% in four cases. One of the companies described the second segment as 'other'. Again, it is difficult to see the value of a segmental analysis under these circumstances. Twenty other companies described one segment as 'other' or used an equivalent term.

Mautz[1] asked analysts for information concerning the maximum number of segments which they could effectively utilise. Table 4.12 shows that a considerable number of companies in the sample violated these maxima; for example nearly 10% of companies reported more segments than over half the analysts said they could use.

The number of segments was the same for both turnover and profit in 77 of the cases (95%) where both were given. Of the remaining cases, two contained more detail for turnover and two more detail for profit, including one case where turnover from banking and allied activities was not stated.

4.5 AUDIT COVERAGE

Because it appears in the directors' report, segmental information does not have to be audited. The professional bodies criticised this aspect of the requirements in their joint submission on the Companies Bill which

---

1 Mautz, chapter 4.

Table 4.12

Number of segments: user needs and provision

Number of segments	Percentage of analysts regarding this number as the maximum which could be handled effectively	Percentage of companies exceeding this number
5 or fewer	14.8	23.3
8 or fewer	56.1	9.3
11 of fewer	87.3	2.3

became the Companies Act 1967:

> 'The accounting bodies consider that the analysis required by clause 17 should be made a statement "annexed" to the accounts and thus removed from the directors' report. The requirement will confront many companies with difficult problems of interpretation, allocation and presentation to which the answers will be matters of opinion involving, perhaps extensively, the exercise of judgement. This, however, is a feature of many problems which already arise in drawing up accounts. Moreover the information called for is accounting information which may itself be highly relevant to the presentation of a true and fair view of the results of the year. For these reasons it seems proper that the opinion of the directors as expressed in the information which is given should be subjected to the judgement of the auditors.'[1]

Mautz[2] asked the analysts in his survey whether they would wish segmental information to be audited: 27% said they regarded audit coverage as 'essential' and a further 56% rated it 'desirable'.

Despite this apparent desire for segmental information to be audited, and the willingness of auditors to carry out the task, in fact only a very small number of analyses covered by the survey were audited. The numbers were 14 for turnover and 13 for profit, and in both cases amount to 16% of the relevant totals.

4.6 TIME-SERIES

In all, 46 analyses contained information relating to more than two years. Table 4.13(i) shows the distribution of analyses by the number of years in the series. The modal length was five years, although 22% of the

---

1 Joint Memorandum to the Board of Trade by the Institute of Chartered Accountants in England and Wales, the Institute of Chartered Accountants of Scotland and the Association of Certified and Corporate Accountants, The Accountant, 28 January 1967, p 111.

2 Mautz, chapter 4.

Table 4.13 (i)

Time-series by number of years in series

Years	Number of analyses:		
	Activity	Geographical	Total
3	3	1	4
4		1	1
5	13	11	24
6	2		2
7	2	1	3
8	1		1
9	1		1
10	5	5	10
	27	19	46

Table 4.13(ii)

Time-series by information given

Information	Percentage of time-series to total analyses:	
	Activity	Geographical
Turnover	8.0	11.3
Profit	13.1	5.3
All other information	47.4	21.1

analyses extended over ten years. Although the provision of several years' data may be valuable, the usefulness of long series of accounting data in general is limited, especially in the case of data drawn up under the histrorical cost convention. Segmental information is further restricted in usefulness by problems of changing segment definition and composition.

Table 4.13(ii) shows the time-series as a percentage of all analyses giving the same information. The incidence of time-series was much higher for non-statutory information than for turnover and profit. This probably reflects the gratuitous nature of both kinds of disclosure.

4.7 DATA UNITS

Of the 86 companies giving quantified turnover analyses, 69 (80%) gave monetary units only, 7 gave percentages only and 10 gave both. In the case of profit analyses, of 83 companies, 74 (89%) gave monetary units only, three gave percentages only and six gave both. The higher incidence of percentages for turnover may reflect a literal interpretation of the statute, which refers to 'proportions' with respect to turnover, but 'monetary terms' for profits.

To a large extent, a discussion about data units is one about convenience rather than informational content, since monetary amounts are readily convertible to percentages and vice versa. It is not always possible, however, to convert from percentages to monetary units if the base is not properly defined. For example, turnover can be analysed before or after internal sales, profit before or after interest, and so on. Analyses given in percentages only can obscure the precise aggregate which is being

analysed and the accounting policies which have been employed, and thereby vitiate comparisons between companies. Hence it may be sensible to regard an analysis in monetary terms as providing the most useful information for sophisticated users, whilst popular presentation techniques are available for supplementary use.

4.8 LOCATION

As table 4.14 shows, 62% and 64% respectively of turnover and profit analyses were given in the dirctors' report, as required by law. The remaining analyses were given in separate statements, the body of the accounts, the notes to the accounts, the review of operations and statistical summaries. One company divided the turnover data between the directors' report and the notes; two companies repeated the turnover data, and six the profit data in a second location. Of the 81 companies giving both kinds of data, 77 (95%) gave both analyses in the same place.

4.9 RECONCILIATION TO THE MAIN ACCOUNTS

It must reinforce the value of segmental information if it is clearly reconciled to the main accounts, thereby providing information about the level at which the data has been calculated, the accounting policies employed, and so on. Only 72% of turnover reports were reconciled however; in eight cases the turnover was not given elsewhere, in seven cases the segmental analysis was given in percentage form only and for nine companies the aggregate figures for segmental turnover were not reconciled

Table 4.14

Location

Location	Turnover analyses	Profit analyses
Directors' report	53	53
Separate statement	17	19
Notes to the accounts	8	6
Review of operations	4	2
Accounts	2	3
Statistical tables	1	
Divided between directors' report and notes to the accounts	1	
	86	83

to the profit and loss account, leaving readers to guess the reasons for the discrepancy. For profit information, however, all analyses were reconciled.

4.10 COMPARATIVES

Since it appears in the directors' report, segmental information is not required to show comparatives for the previous period. However, they do, almost certainly, add to the information content of the report, and, in practice, 69 companies (80%) did give comparatives for turnover. (The figures for profit are not significantly different). It is possible that this high level of gratuitous disclosure was caused, not by a genuine concern to extent information provision, but by a behavioural phenomenon: accountants are so used to give comparatives that they cannot break the habit!

In the ordinary way, of course, comparative data can be obtained from the previous year's report, but where segmental definitions have been altered between periods, it is particularly important that comparatives should be disclosed.

4.11 PRESENTATION

Seventy-nine companies (92%) presented turnover information and 80 (96%) presented profit information in tabular form, and there is little doubt that this is the superior method from the point of view of the sophisticated reader. For turnover, six companies gave the information in narrative

form, and for profit, the figure was three. One company used a graphical presentation for its turnover data; five companies repeated turnover data and two repeated profit data in graphical form. Two companies providing both turnover and profit data used different presentations for the two: this considerably increases the difficulty of making comparisons. As in the case of data units, whilst 'simplified' presentations may be appropriate for a variety of users, the sophisticated reader needs the data in traditional form, to facilitate the manipulation of the data.

4.12 ADDITIONAL DISCLOSURES

Table 4.15 shows that 19 disclosures other than monetary turnover and profit were made on a segmental basis by activity. The disclosures were made by 18 companies; 15 companies made the disclosure in addition to turnover and profit and three as an alternative. The nature of the additional disclosures, and the combination of disclosures made varied widely, as can be seen from tables 4.4 and 4.15. Amongst the information disclosed were net assets, fixed assets, capital expenditure, sites, sales (units), employees, R and D expenditure and production (units). Geographical disclosures included many of these items, as well as order books, and a full profit and loss account.

In addition to the disclosures mentioned so far, two companies provided a breakdown of profit by year of acquisition of the unit making the profit, and two provided a breakdown of profit between new and established members of the group, distinguishing in the comparatives between companies still in the group at the end of the following year and those disposed of during the year. To be fully effective, of course, such disclosure needs itself to be on a segmental basis.

Table 4.15

Additional disclosures

Information	Activity analyses:		Geographical analyses:	
	Number of analyses	Number of time-series	Number of analyses	Number of time-series
Net assets	9	3	9	
Employees	2		3	
Capital expenditure	2	1	2	1
Sales (units)	2	2	1	1
Production (units)	1	1	2	2
Fixed assets	1	1		
Sites	1	1		
R and D expenditure	1			
Full profit and loss account			1	
Order book			1	
	19	9	19	4

4.13 TREATMENT OF INTERNAL SALES

The treatment of internal sales was the most inadequate area in the treatment of turnover. The existence of sales across the boundaries between segments raises conceptual problems of great importance which are discussed elsewhere in this study. Clearly, the determination of the price at which inter-segmental transactions take place will determine the extent of the profit which each segment enjoys from the transaction and the subsequent onward sale to third parties. No company in the survey in fact disclosed sufficient information about its accounting policies to provide useful data on the question of inter-segmental pricing. However, whatever pricing policy is adopted, there arises the subsidiary question of accounting treatment. The normal practice on consolidation is to eliminate internal sales from the total so as to provide a figure for group turnover to third parties. As far as segmental analyses are concerned, the alternatives include:

1 Showing all figures (including the total) inclusive of internal sales, so that the total of the segmental analysis will not agree with the figure for turnover in the profit and loss account. Since this treatment will leave readers guessing as to the reason for the discrepancy, it is clearly insatisfactory, unless it is clearly stated that the only reason for the difference is the different treatment of internal sales, in which case the treatment becomes identical in information terms to (2).

2 Showing each segment's turnover inclusive of internal sales, but eliminating these 'below the line' ie as one aggregate figure so as to bring the segmental analysis into agreement with the main accounts. This method will preserve the relationship between turnover and profit, that is, it will report as turnover all the transactions for which a profit is reported, but it will give no information about which segments are trading

internally.

3 Eliminating internal sales against selling divisions so that each segment reports only its own sales to third parties. Whilst attractive at first sight, this policy can lead to severe distortions in interpretation: segments which form a large part of the organisation in terms of capital employed, employees and even profit may appear negligible, or disappear altogether if the greater part, or all, of their sales are made within the group. A segment's profit will not therefore be directly comparable to its turnover if a material proportion of its profit was earned on sales within its own group.

4 Eliminating internal sales against the buying segment so that each segment reports the amount of its external sales which has arisen within the segment. This method would partially eliminate the distortions mentioned under (3), although not, of course, any distortions in the pricing policy of the group. Its disadvantages are that it is difficult to provide a rationale for the resulting turnover figure (it is not, for example, value added), and that the figure reported as turnover cannot be related to physical flows in the way that figures reported under other methods can.

5 Providing separate figures for internal and external turnover, showing internal turnover against the selling segment. This provides data on the pattern of internal transactions by selling but not by buying divisions.

6 Providing separate figures for internal and external turnover, showing internal turnover against buying segments. This, like (5) gives some information about the pattern of internal sales, but not complete information.

7 Providing a matrix showing internal sales by selling and buying segments. An example of such a presentation is given in figure 4.1. This method preserves the comparability of profit and turnover, whilst providing full information on the pattern of internal trade. The advantages and

Selling segment	Purchased by:					Total sales
	Segment A	Segment B	Segment C	Total internal sales	Outside parties	
Segment A		10		10	90	100
Segment B	5		5	10	40	50
Segment C	15			15	65	80
Segment D				0	50	50
Total	20	10	5	35	245	280

Segment	External turnover by segment	Sales revenue net of internal sales received
Segment A	90	80
Segment B	40	40
Segment C	65	75
Segment D	50	50
Total	245	245

Figure 4.1: Internal sales presented in matrix form, and the effect of netting internal sales against selling and buying segments

disadvantages of the various methods is summarised below:

	Method:						
	1	2	3	4	5	6	7
Method provides information on -							
Level of internal sales		x			x	x	x
Pattern of internal sales -							
By selling segment			x		x		x
By buying segment				x		x	x
Profit comparability	x	x			x	x	x
Segment scale	x	x		x	x	x	x
Relationship of monetary figures to physical flows	x	x	x		x	x	x

As table 4.16 shows, companies adopted a wide range of the alternatives described above, although none provided a full matrix. Twenty-nine companies (34%) did not specify their treatment of internal sales, and a further 34 (40%) stated that internal sales had been eliminated but did not specify by what method. Thus, nearly three-quarters of the companies giving an analysis of turnover did not identify the treatment they had adopted. This must surely severely reduce the usefulness of the information provoded. Of the 23 companies which did disclose their policy with respect to internal sales, 14 eliminated sales 'below the line' (method 2), and the remaining companies used a variety of the alternative methods.

The financial analysts questioned by Mautz[1] were asked at what point they would consider that the proportion of inter-segmental sales to total sales would cause segmental data to lose its significance because of the element of arbitrariness introduced by cross-segmental transfers. This figure will, of course, itself be influenced by any arbitrariness in the transfer

---

1 Mautz, chapter 4.

Table 4.16

Treatment of internal sales

	Number of analyses
Eliminated 'below the line' (method 2)	14
Not eliminated (method 1)	6
Eliminated against selling segment (method 3)	2
Shown separately by selling segment (method 5)	1
Total specifying treatment	23
Eliminated on unspecified basis	34
No treatment specified	29
	86

pricing policy of the group - for example, a group in which transfer prices are 'artificially' low so as to locate profit in the buying divisions will appear to have a relatively low proportion of inter-segmental sales - but it may provide a rough and ready guide to the importance of inter-segmental sales. Of the 17 companies in the sample which excluded internal sales on a specified basis, 16 stated the amount of the sales so eliminated. Table 4.17 compares the number of analysts who would regard internal sales of particular levels as invalidating segmental information with the number of companies reporting sales of that level and above.

The table shows that 25% of the companies reported inter-segmental sales of a level which exceeds the limit set by 60% of analysts, although, of the four companies in this category, none exceeded the limit by more than two percentage points, whereas Maut'z class intervals widen at this point, so that the acceptability of the data may be greater than at first indicated. Ignoring this consideration, three-quarters of the companies in question reported levels of internal sales which would be acceptable to three-quarters of the analysts in Maut's sample. It is very difficult to draw firm conclusions about this question, however, not only because of the inherent arbitrariness of the value of transactions between segments, but also because the level of internal sales will be partly a function of how the segments are defined.

4.14 TREATMENT OF CERTAIN ITEMS OF INCOME AND EXPENSE

Perhaps the least satisfactory aspect of segmental profit reporting is the treatment of certain categories of group income and expense, where there is outright confusion. The items of 'expense' which were considered in the

Table 4.17

Level of internal sales causing invalidity of segmental information

Proportion of sales made internally (%)	Proportion of analysts who would regard this proportion as invalidating segmental analyses (%)	Companies with internal sales exceeding this proportion
1	1.1	15
3	3.2	12
5	24.7	8
7	26.8	6
10	60.0	4
15	69.5	0

survey were central costs, interest expense, taxation, minority interests and extraordinary items. Segmental profit was struck before allowing for these items by, respectively, 17%, 74%, 98%, 96% and 99% of the companies to which they were relevant (table 4.18). The remaining companies deducted the items from segmental profit, or chose some mixed treatment. One company included some interest expense in its segmental report and excluded the rest; one company charged all its central costs to one segment. In only three of the 66 cases in which extraordinary items were excluded from segmental income were none of the extraordinary items directly related to segmental activities (for example, costs associated with the parent company's share capital). Nine companies excluded some or all of their exceptional items, including profits or losses on exchange, the cost of a profit-sharing scheme and special pension costs.

Much the most common item to be allocated between segments was central costs. These were in fact rarely mentioned by companies, but in view of their nature they may be assumed to exist for all companies, and 83% of the companies in the sample allocated all central costs to segments. Of the analysts interviewed by Mautz[1] however, 61% indicated that they felt that there were some categories of organisational expenditure, the allocation of which might be misleading. Amongst the expamples cited were research and development expenditure, institutional advertising and senior management remuneration.

Two items of income were examined (table 4.19). Just over half (53%) of the companies excluded the group's share of the results of associated companies from segmental income, and 60% of companies excluded some or all 'financial income' (for example, investment income and interest

---

1 Mautz, chapter 4.

Table 4.18

Treatment of certain categories of expense and other deductions

Item	Number of analyses:			
	Item deducted from segmental income	Segmental income struck before item	Not applicable	Other
Central costs	68	14		1[1]
Interest expense	21	61		1[2]
Minority interests	3	71	9	
Taxation	2	81		
Extraordinary items	1	66	16	

Notes: (1) Charged to one segment.

(2) Some interest charged to segments.

Table 4.19

Treatment of certain categories of income

Item	Number of analyses:			
	Item included in segmental income	Item excluded from segmental income	Not applicable	Other
Share of profits of associated companies	36	40	7	
Financial income	33	47	1	2[1]

Note: (1) Mixed.

receivable). Amongst the 55 companies to which all seven classes of cost and revenue applied, no fewer than 15 different combinations of treatment were identified, and these are tabulated in table 4.20. The most popular policy was to exclude all items except central costs, but this was adopted by only one third of the companies in the sample. Eleven percent of companies chose to exclude interest expense, central costs, associates' profit and financial income. No other policy commanded support from more than 10% of the sample.

4.15 CONCLUSIONS

4.15.1 Avoidance of disclosure requirements

Direct evidence of failure to comply with statutory requirements is impossible to obtain, for reasons discussed in section 4.2.1, but there was a substantial body of indirect evidence of 'avoidance', including:

1 The relatively high incidence of non-provision of statutory information (37%) amongst a sample drawn from the largest companies in the United Kingdom.

2 The large proportion of non-providers who nevertheless gave evidence elsewhere in their reports of diversification.

3 The small number of directors' reports which actually contained an explicit statement that the directors considered the business to be of one class.

4 The presence of qualitative statements in the accounts which appeared to be based on quantitative information which was not, however, published.

5 The presence in every single broad industrial grouping of at least one company giving a segmental analysis.

6 A marked imbalance between disclosure of turnover and disclosure of profit.

Table 4.20

Combined policies for seven items of expense and income

Include only	Number of analyses
Central costs	20
Central costs - interest - associates' profits - financial income	6
Central costs - associates' profits	4
Associates' profits	3
Central costs - financial income	3
Associates' profits - financial income	3
Central costs - interest - financial income	3
Interest - financial income	2
Central costs - associates' profits - financial income	2
Interest - taxation - minorities - associates' profits - financial income (Note 1)	2
Central costs - interest	1
Central costs - interest - associates' profits	1
Central costs - extraordinary items - associates' profits - financial income	1
Central costs - interest - minorities - associates' profits - financial income	1
None	3
	55

Note: (1) Of these, one also gave information before tax and interest, and one also gave information before tax.

7 Selection of bases of segmentation other than those complying with statutory requirements.

8 Frivolous segmentation: selection of segmental definitions which produce one very large segment, or a number of insignificant ones.

9 Absence of audit coverage.

10 Selection of data units which prevent or discourage comparison with aggregate data, for example percentages.

11 Location of turnover and profit data in different places, or provision in different formats, or on different bases.

12 Selection of segment definitions leading to an unacceptably high level of inter-segmental sales.

13 Provision of non-statutory but not statutory information.

4.15.2 The nature of treatments adopted

The range of treatments adopted was found to be extremely wide; perhaps so wide as to make any kind of comparison between segments of different companies impossible without additional data. Specific examples of confusion and inconsistency include:

1 Selection of segmental definitions yielding too many segments or insignificant segments.

2 Selection of unusual bases for segmentation, or mixed bases.

3 Provision of comparatives and time-series.

4 Selection of data units.

5 Presentation.

6 Treatment of internal sales.

7 Treatment of various components of income and expense.

4.16 OTHER SURVEYS: UNITED KINGDOM

4.16.1 Institute of Chartered Accountants in England and Wales

The Institute of Chartered Accountants in England and Wales publishes annually a survey of methods used in the accounts of 300 major British industrial companies.[1] Surviving companies are included in succesive surveys and companies which cease to fall within the sampling frame are replaced from the larger companies in the Times 1000.[2] Table 4.21 shows the extent of disclosures of class of business information in the Institute survey since its inception. There has been a modest upward trend in the proportion of companies disclosing segmental information throughout the period (with the exception of a minor peak in 1973/74), although the interpretation of this trend is beset by the problems discussed in section 4.2.1. The proportion of company giving statutory disclosures in 1974/75 (57%) is slightly lower than the proportion in the author's sample (63%) which is consistent with the larger range of sizes present in the Institute sample.

The Institute survey gives a breakdown of companies not disclosing segmental information between cases where it is stated or is apparent from other evidence in the accounts that the business is of a single class, and cases where this is not apparent. For the latter class, a generous

---

1 Institute of Chartered Accountants in England and Wales, Survey of published accounts (London: Institute of Chartered Accountants in England and Wales, annual). **References are to the year of the survey.**

2 For a detailed description of the sampling frame, see Institute of Chartered Accountants in England and Wales, 1977, p 5.

Table 4.21

Disclosures by companies in the ICAEW's annual survey of 300 companies

	1968/ 69	1969/ 70	1970/ 71	1971/ 72	1972/ 73	1973/ 74	1974/ 75	1975/ 76	1976/ 77
Companies disclosing:									
Turnover and profit	128	150	150	156	159	180	171	174	177
Turnover only	)	(	12	17	15	40	19	12	16
	) 13	13(							
Profit only	)	(	5	4	5	2	4	5	2
	141	163	167	177	179	222	194	191	195
Companies not disclosing activity analyses:									
Business stated to be of one class or (after 1973/74) evidence of this given in the accounts		15	13	12	20	15	70	62	61
Others		122	120	111	101	63	36	47	44
		300	300	300	300	300	300	300	300
Percentage of companies giving statutory disclosure		50	50	52	53	60	57	58	59
Percentage of companies giving some disclosure of turnover or profit		54	56	59	60	74	65	64	65

Note: The requirements of section 17 of the Companies Act 1967 did not apply throughout 1968/69.

interpretation is given:

> 'Where neither type of analysis is given and there is no comment it is to be assumed that the business is considered to be of a single class.'[1]

In 1974/75, 74% of companies provided information in the accounts directly corroborating the assertion that the business was of a single class, whereas in the author's sample, 63% of companies in the same position provided information in the accounts which was considered to be inconsistent with the assertion that the business was of a single class. These figures are clearly inconsistent, and probably reflect different views about the implications of information in the accounts.

The amount of data given in the Institute survey about the variety of methods used in drawing up segmental analyses has diminished steadily over the years, and is now very limited. However, the comments in the 1977 survey confirm the conclusions reached earlier in this chapter:

> 'In connection with turnover, a few companies stated explicitly in the analysis whether internal sales within the group were excluded (which was most usual) or included, sometimes showing internal sales as a deduction from total sales. In most cases it was necessary to refer to the accounting policies to obtain this information.... With regard to analysis of profits and losses, overhead expenses were sometimes all allocated to classes of business, but more often group charges and interest were shown in a single figure.... The classification of business activities was usually based on products or services, but in some cases was based on markets or on operating divisions within the group.'[2]

---

1 Institute of Chartered Accountants in England and Wales, 1972/73, p 152.

2 Institute of Chartered Accountants in England and Wales, 1977, p 177.

4.16.2 Emmanuel and Gray

Emmanuel and Gray[1] surveyed the latest accounts available at 1 August 1976 of the 100 largest quoted industrial companies ranked by turnover in the Times 1000 for 1975/76, in an 'attempt ... to examine the extent to which large UK companies disclose segmental information.'[2] Their survey showed that 78% of companies in the sample provided an activity analysis of turnover or profit or both, and this result is consistent with the author's result of 70% for a sample which included a larger range, by size, of companies, and related to a period some eighteen months earlier. As in the author's sample there was a significant proportion of companies (10%) which disclosed turnover or profit but not both. Emmanuel and Gray also examined the accounts under investigation for other evidence of diversification besides possible activity analyses, and concluded that,

> 'it is clear that in a majority of cases, both in respect of those [companies] providing segmental disclosures and those providing only single class of business disclosure, there is no consistency as between [that] disclosure and [other] information about the company's organisation.'[3]

This supports the author's conclusions about companies that did not provide activity analyses.[4]

---

1 C R Emmanuel and S J Gray, 'Segmental disclosures and the segment identification problem', Accounting and Business Research, 1977, pp 37-50.

2 Emmanuel and Gray, p 38.

3 Emmanuel and Gray, p 40.

4 Section 4.2.4.

4.17 OTHER SURVEYS: USA[1]

4.17.1 Mednick

Mednick[2] conducted what is probably the first survey of reporting practices since the implementation of SFAS 14. The survey covered 250 randomly selected reports of publicly owned US companies for 1977. Some 25% of companies in the survey reported that they operated in only one industry and a further 8% reported that they had one dominant industry segment, and hence had no need to report segmental information. This is a remarkably low figure, given the wide range of companies included in the sampling frame. Interestingly,

> '[SFAS 14] produced somewhat more segments than the old SEC rule produced lines of business: 25% of survey companies reported more segments than before, 15% reported fewer, 60% reported the same number.'[3]

Mednick also reports some evidence about the effect of a special SEC ruling:

> '... well before [SFAS 14] became effective, the SEC staff grew concerned that some companies might rely too much on their old line-of-business reporting and not take a sufficiently detailed approach under the new financial reporting standard. The SEC was especially concerned about large companies that had been reporting only one or two separate lines of business. This concern was formalised in March 1978 with the issuance of Accounting Series Release 244 ("ASR 244"). ASR 244 discusses application of [SFAS 14] to five industries - electrical and electronic products, forest products, chemicals, drugs and property/casualty insurance - and emphasises that one industry segment will not normally be adequate.

---

1 The American Institute of Certified Public Accountants publishes an annual survey of published accounts which includes information relating to segmental disclosure. However, in view of the large number of changes in relevant requirements during the last few years, the data is of little value for comparisons through time.

2 R Mednick, 'Companies slice and serve up their financial results under FASB 14', Financial Executive, March 1979, pp 44-56.

3 Mednick, p 48.

> In view of ASR 244, it's useful to see whether the 57 companies in the survey group that fell primarily in those five industries reported more **or** fewer segments in 1977 compared to other companies. Analysis revealed no significant effect of ASR 244 on the companies that had been reporting more than one line of business - 43 out of the 57 companies. But there was a much more discernible effect on the 14 companies that had reported only one line of business in 1976. Seven of the 14 reported more than one industry segment in 1977 annual reports, and four of the seven indicated that they had four or more reportable segments under [SFAS 14].'[1]

Mednick's survey encounters the same problem as the author's: the degree of flexibility in the SEC's rules means that the evidence cited above cannot 'prove' that the earlier rules were being broken, but there does appear to be some indication that tightening the regulations has produced greater disclosure. Reliance on the observance of the 'spirit' of loosely-framed regulations seems unwise.

---

1 Mednick, pp 48, 50.

Appendix 4.1

COMPANIES IN THE SAMPLE

	Activity analyses provided:		
	Turnover	Profit	Other
Albright and Wilson	x	x	-
Allied Breweries	-	-	-
Amalgamated Metal Corporation	x	x	-
APCM	-	-	-
Arthur Guiness	x	x	-
Associated Biscuit	x	x	-
Associated Engineering	-	-	-
Automotive Products	-	-	-
Averys	-	-	-
Babcock and Wilcox	x	x	-
Bass Charrington	-	-	-
Bibby	x	x	-
BICC	-	-	-
Birmid Qualcast	x	x	-
Blackwood Hodge	x	-	-
BOC International	x	x	-
Booker McConnell	x	x	x
Bowater	x	x	-
Bowring	x	x	-
BP	-	-	x
Bridon	-	x	-
British-American Tobacco	x	x	x
British and Commonwealth Shipping	x	x	-
British Leyland	x	-	-
British Sugar	-	-	x
BSG International	x	x	-
BSR	x	x	-
BTR	x	-	-
Bunzl Pulp and Paper	x	x	-
Burmah Oil	x	x	-
Burton Group	x	x	-
Cape Industries	x	x	-

Appendix 4.1 (continued)

	Activity analyses provided:		
	Turnover	Profit	Other
Carpets International	-	-	-
Carrington Viyella	-	-	-
Charterhouse Group	x	x	-
Clarke Chapman	-	-	-
Coats Patons	x	x	-
Croda International	-	-	-
Danish Bacon	-	-	-
Delta Metal	x	x	x
Dickinson Robinson	x	x	-
Drake and Cubitt	x	x	x
Dunlop	x	x	-
English China Clays	x	x	x
European Ferries	x	x	-
Fisons	x	x	x
Foseco Minsep	x	x	-
French Kier	-	-	-
Furness Withy	x	x	-
Gestetner	-	-	-
GKN	x	-	-
Glynwed	x	x	-
GMH	x	x	-
Granada	x	x	-
Greenall Whitley	-	-	-
Haden Carrier	x	x	-
Hanson Trust	x	x	-
Hawker Siddeley	x	x	x
Henlys	-	-	-
Hepworth Ceramic	x	x	-
Hoover	-	-	-
ICI	x	x	-
ICL	-	-	-
Imperial Group	x	x	-
John Laing	-	-	-
Kenning Motor Group	-	-	-
Ladbroke	x	x	x

Appendix 4.1 (continued)

	Activity analyses provided:		
	Turnover	Profit	Other
Laird	x	x	-
Lamson Industries	-	-	-
Laporte Industries	-	-	-
Lead Industries	-	x	-
Leonard Fairclough	-	-	-
Leslie and Godwin	-	-	-
Lex Service Group	x	x	-
London and Northern Securities	x	x	-
London Brick	x	x	-
Lonrho	x	x	-
Lucas Industries	x	x	-
Marchwiel Holdings	x	x	-
Marley	-	x	-
Mathews Holdings	x	x	-
McKechnie Brothers	-	-	-
Newarthill	-	-	-
News International	x	x	-
Northern Foods	x	x	-
Nottingham Manufacturing	-	-	-
Ocean Transport and Trading	x	x	-
Ozalid	-	-	-
P & O	x	x	-
Proprietors of Hays Wharf	x	x	x
Rank Hovis McDougall	x	x	-
Rank Organisation	x	x	-
Ready Mixed Concrete	-	-	-
Reyrolle Parsons	-	-	-
Richard Costain	-	-	-
RTZ	x	x	-
Rugby Portland Cement	x	x	-
S & W Berisford	-	-	-
Sedgewick Forbes	x	-	-

Appendix 4.1 (continued)

	Activity analyses provided:		
	Turnover	Profit	Other
Shell	-	-	x
Simon Engineering	x	x	-
Smith and Nephew	x	x	-
Smiths Industries	x	x	-
S Pearson	x	x	-
Steetley	x	x	-
Stenhouse Holdings	x	x	-
Stone-Platt	x	x	x
Swan Hunter	x	x	-
Tarmac	x	x	-
Tate and Lyle	x	x	-
Taylor Woodrow	-	-	-
Thomas Tilling	x	x	x
Thomson Organisation	x	x	-
Thos W Ward	x	x	-
Tozer, Kemsley and Millbourn	x	x	-
Trafalgar House	x	x	-
Transport Development Group	x	x	-
Trust Houses Forte	x	x	-
Tube Investments	x	x	x
Turner and Newall	x	x	x
Ultramar	-	-	-
Unilever	x	x	x
United Biscuits	x	-	-
Vickers	x	x	-
Weir Group	x	x	-
Westland Aircraft	x	x	x
William Mallinson and Denny Mott	x	x	-
Wimpey	-	-	-

Chapter 5

THE ALLOCATION PROBLEM IN THE ORTHODOX MODEL

5.1 THE NATURE OF AN ALLOCATION

Matching is a fundamental tenet of generally accepted accounting principles. Grady[1] gives as his Principle A-2 that 'costs of sales and expenses should be appropriately matched against the periodic sales and revenues',[2] whilst Statement of Standard Accounting Practice Number 2 states that,

> 'revenues and costs are accrued (that is, recognised as they are earned or incurred, not as money is received or paid), [and] matched with one another so far as their relationship can be established or justifiably assumed....'[3]

The normal criterion to be employed in matching is the test of benefit:

> 'Initially, cost incurrence produces an asset or provides a service, the benefits of which are expected to produce present or future revenue. As the benefits are used up or expire, the portion of the cost applicable to the revenues realised is charged against revenue.'[4]

The process of matching requires that allocations be made. According to Thomas,[5] allocation involves,

---

1 P Grady, Inventory of generally accepted accounting principles (Accounting Research Study Number 7) (New York: American Institute of Certified Public Accountants, 1965).

2 Grady, p 99.

3 Statement of Standard Accounting Practice Number 2: Disclosure of Accounting Policies (London: Institute of Chartered Accountants in England and Wales, 1972), paragraph 14.

4 Grady, pp 99-100.

5 A L Thomas, Financial accounting: the main ideas (Belmont, California: Wadsworth, 1972).

> 'the assignment of costs, revenues, cash flows or funds flows to individual inputs or groups of inputs to the firm, including assignment to individual periods of time, divisions of the firm, etc.'[1]

In a subsequent work[2] Thomas provides a rather broader definition:

> 'An allocation is a partitioning of a set (and the assignment of the resulting subsets to different groups, periods of time or other loci.'[3]

Thomas established three requirements for an allocation scheme. It should be additive; it should be unambiguous; and it should be defensible. By additivity, Thomas means that the rules contained in the scheme should specify allocations which sum to the total amount to be allocated and no more. By requiring schemes to be unambiguous he means that, 'once the allocation method has been specified, it should be impossible to divide the total into more than one set of parts.'[4] By requiring the scheme to be defensible he means that it should be possible to 'defend ... the method against all possible alternatives.'[5]

The essence of Thomas' argument is that it will often be impossible to construct an allocation scheme which satisfies these requirements other than arbitrarily, and that an arbitrary scheme will not have referents in the real world: it will be incorrigible in the sense of being 'impossible to verify or falsify.'[6] This is equivalent to saying that allocations

---

1 Thomas, 1972, p 768, emphasis suppressed.

2 A L Thomas, The allocation problem: part two (Studies in Accounting Research Number 9) (Sarasota, Florida: American Accounting Association, 1974).

3 Thomas, 1974, p 1.

4 Thomas, 1974, p 1.

5 Thomas, 1974, p 1.

6 Thomas, 1974, p 51.

will not pass the test of verity proposed in chapter 2.

As Thomas himself recognises, the demonstration of a negative assertion of this sort is likely to be unsatisfactorily incomplete. He takes as an example of allocation, orthodox depreciation, and considers a variety of possible approaches at some considerable length, particularly in the earliest work.[1] He does provide, in a later volume, a generalisation of his conclusion:

> 'The cause of this arbitrariness may be expressed in one word: interaction. Inputs interact in producing output, revenues or cash flows whenever the amounts produced by the inputs working together differ from the total that these inputs would have produced working separately. Input interaction pervades the business world.'[2]

Gould[3] puts it even more strongly:

> 'The logical fallacy of allocation lies in the attempt to treat B as independent of A when the conditions of the problem state that A and B are interdependent.'[4]

It is perhaps worth emphasising that the test of defensibility requires that a given allocation scheme should be able to be defended <u>against all comers</u>; it is not sufficient merely to be able to produce some defence of some particular scheme. In most instances (including both depreciation and FDDO) the problem is likely to be, not that there is no scheme that can be defended, but rather that there is a wide variety of schemes, each with its own rationale. It may be argued that the available schemes are operational approximations to a theoretical (and unmeasurable) ideal.

---

1 A L Thomas, <u>The allocation problem in financial accounting theory</u> (Studies in Accounting Research Number 3) (Evanston, Illinois: American Accounting Association, 1969).

2 Thomas, 1974, pp 15-16, emphasis and footnote suppressed.

3 J R Gould, 'The economist's cost concept and business problems', <u>in</u> W T Baxter and S Davidson, <u>Studies in accounting</u> (London: Institute of Chartered Accountants in England and Wales, 1977).

4 Gould, p 231.

Thomas rejects this, under the conditions he specifies, because there is no non-arbitrary way to allocate the consequences of interaction.[1]

5.2 ALLOCATION IN THE ORTHODOX FDDO MODEL

5.2.1 The problem recognised

The major problems associated with FDDO in accordance with generally accepted accounting principles are customarily grouped in the following way:

> 'Three technical problems of reporting information on segments of a diversified company exist:
>
> (a) Identifying segments for reporting purposes.
>
> (b) Allocating common revenues, costs and other items among segments.
>
> (c) Reporting inter-segment transactions.'[2]

The identification of segments will not be considered in this chapter; the second and third problems isolated by the Accountants International Study Group are really two manifestations of the same problem, namely interaction between elements of the organisation. As has been pointed out, it is the existence of interactions which gives rise to the general problem of allocation within generally accepted accounting principles, and this section treats common costs and inter-segmental transactions within this context.

The similarity between common costs and inter-segmental transactions may be illustrated by a simple example. Consider expenditure on research and

---

1 For a brief guide to the work of A L Thomas, see appendix 5.1.

2 Accountants International Study Group, Reporting by diversified companies (London: Institute of Chartered Accountants in England and Wales, 1972), paragraph 31.

development which benefits more than one segment. If such expenditure is met by corporate headquarters it would be treated in the orthodox model as a common cost, whereas if it had been incurred by one segment, which then recovered part of the cost by charging other segments, it would be treated as a problem of transfer pricing.

5.2.2 The problem disposed of: the received wisdom of common costs

The orthodox model deals with the problem of common costs by either (a) ignoring it (as in the United Kingdom legal requirements) or (b) proposing allocations of the traditional arbitrary type. The Financial Accounting Standards Board, for example, requires that 'expenses ... that are not directly traceable to ... [a] segment ... be allocated on a reasonable basis.'[1] The Canadian Institute of Chartered Accountants recommends that income data reported for segments should exclude 'common costs', but these are defined as costs 'incurred for the benefit of the enterprise as a whole',[2] so costs which benefit two or more, but not all, segments of the enterprise should, presumably, still be allocated. In any event, the Institute accept that 'it may ... be necessary to assign prices to ... transactions between segments',[3] although they do not explicitly recognise that this gives rise to the same conceptual problem as the allocation of common costs.

Mautz recommended the disclosure of 'contribution to income ... before or

---

1 SFAS 14, paragraph 10, emphasis added.

2 A F Lamb, Analysed reporting: a background study (London: Institute of Chartered Accountants in England and Wales, 1977), p 106.

3 Lamb, p 108.

after the allocation of common ... costs',[1] and recognised that it is possible that 'the method of pricing intra-company transfers ... significantly affects the reported contribution to income.'[2] The American Accounting Association[3] suggested that 'ascribable costs' should be allocated. They did not define the term, but if they are following the Financial Accounting Standards Board Discussion Memorandum to which they are responding, the implication of the term for interaction effects is unclear.[4] Lamb is prepared to allow management discretion to allocate head office expenses, and considers that other common costs (except interest) should be allocated on a basis 'consistent with achieving the objectives of analysed information',[5] although he provides no test of consistency.

Lurie[6] is typical in the advice he gives to accountants drawing up accounts to comply with SFAS 14:

> 'The consideration and treatment of the values assigned and the allocation procedures should therefore be studied thoroughly to result in reasonable justifiable methods.'[7]

He also hints at the scope for 'creative' accounting provided by the flexibility of the requirements:

---

1 R K Mautz, Financial reporting by diversified companies (New York: Financial Executives Research Foundation, 1968), p 158.

2 Mautz, p 158.

3 American Accounting Association, Report to the Financial Accounting Standards Board from the Subcommittee on Financial Accounting Standards (Sarasota, Florida: American Accounting Association, 1974).

4 See section 5.2.4.

5 Lamb, p 68.

6 A G Lurie, Business segments: a guide for executives and accountants (New York: McGraw-Hill, 1979).

7 Lurie, p 27, emphasis added.

> 'Executives at all levels should be aware of the influence of the accounting for common costs upon the total costs and upon the operations of each segment of the company. Due consideration should be given to the effect of alternative allocation methods upon the profit result of each segment and the resulting profitability rank of each product line. The new segment-reporting requirements make this more important and therefore management should reassess its present policies in the light of the external disclosure of profitability results.'[1]

5.2.3 The problem resurrected

Unfortunately the problems arising from interaction cannot be disposed of satisfactorily in the fashion adopted by the orthodox model. As Thomas himself recognises, the allocations necessary to produce segmental profit data are species of the genus he has demonstrated to be arbitrary:

> 'Topics on [the Financial Accounting Standards Board's] active agenda or on which it has issued standards include ... segment reporting.... All these topics involve some kind of allocation....'[2]

Thomas went on to urge the Financial Accounting Standards Board to 'avoid launching any new incorrigible allocations in such areas as interim and segment reports, leases, contingencies, interest and pensions.'[3] Unfortunately, they did not accept his advice.

The language employed by those who describe the orthodoxy often reveals the nature of the operations which are to be performed. The Financial Accounting Standards Board, for example, require that costs which are not

---

1 Lurie, p 41.

2 A L Thomas, 'The FASB and the allocation fallacy', The Journal of Accountancy, November 1975, p 65, emphasis supplied.

3 Thomas, 1975, 'The FASB and the allocation fallacy', p 68.

directly traceable to a segment be 'allocated on a reasonable basis'.[1] This is not an impossible requirement to meet. Rather, the problem is one of embarras de richesses: there is a multiplicity of reasonable bases, none more 'reasonable' than any other.

The discussion memorandum which preceded the standard on segmental disclosure discussed the use of allocation bases in the following terms:

> 'Under [the individual allocation] approach, each category of common costs is allocated individually on the basis of usage or a ratio of the segment's operations to total enterprise operations. For example, allocations may be based upon estimated time spent, ratio of segment space occupied to total space, ratio of number of segment sales orders to total sales orders, number of documents processed, number of lines typed, hours of machine usage, standard rate per hour or volume processed, ratio of segment purchases (dollars or number of purchase orders) to enterprise total, etc.'[2]

Although the bases listed are clearly intended to apply to more than one type of cost, it is also clear that, for any particular type of cost, more than one basis could be regarded as reasonable. For example a centralised purchasing department could have its costs charged out on the basis of number of purchases made, value of purchases made, time spent on each segment's business, etc. No single basis can be regarded as reflecting 'benefit' better than any other.

Some of the confusion which Thomas exposes in relation to allocations generally is apparent in the discussion memorandum. For example, in discussing the use of blanket allocations the memorandum argues that,

---

1 SFAS 14, paragraph 10.

2 Financial Accounting Standards Board, Discussion memorandum: An analysis of issues related to financial reporting for segments of a business enterprise (Stamford, Connecticut: Financial Accounting Standards Board, 1974), p 35.

> 'an advantage of the formula basis is that combining several factors as an allocation base may tend to average out inequities which might have resulted from the use of a single factor.'[1]

To suggestthere are inequities which can be averaged out implies that there is some ideal measure of benefit to which operational measures approximate, yet nowhere does the memorandum suggest what this ideal measure is. As Thomas demonstrates, there is no ideal measure of benefit when interaction occurs.

It might be argued that disclosure is satisfactory if the recipient of the information knows both the amount of the allocation and the basis on which it has been allocated. Under these circumstances the recipient will, it is true, be better informed about the nature of the allocation, but it will not make the data 'further down the page' (ie after the allocation has been incorporated in the computation) less arbitrary.

Some versions of the orthodox model do include requirements that the basis for allocations be disclosed. Lamb, for example, suggests that 'the fact that [common] costs have been allocated should ... be stated and the basis of analysis disclosed in general terms.'[2] The degree of generality allowed by the last phrase would be likely, in an organisation of even moderate complexity, to destroy the effectiveness of communication about the bases of allocation. Any assertion that allocations have been made in accordance with benefits received would provide no more information than the assertion that the accounts complied with generally accepted accounting principles. Any attempt to go beyond this would almost certainly require lengthy and complex explanations.

---

1 Financial Accounting Standards Board, p 35, emphasis added.

2 Lamb, p 68.

5.3 A TAXONOMY OF COMMONALITIES

There is almost universal agreement amongst advocates of the orthodox model that a useful distinction can be drawn between common costs and inter-segmental transfers. There is rather less agreement about the rationale for this distinction. Some writers treat as inter-segmental transfers only those transactions which involve the transfer of some physical product (or, in even more restricted cases, transfers of the output of a segment), whereas others allow as inter-segmental transfers any transfer of an element of cost between one segment and another, reserving the expression 'common cost' for expenditure incurred by 'head office'.

As has been suggested earlier in this chapter, there is in fact very little value in classifying costs according to the accident of which part of the organisation happens to suffer the cash outflow. The nature of common costs is subject to widespread confusion, and the taxonomy presented in this section is an attempt to overcome some of this confusion.

One possible classification is by the segment which incurs the expenditure; for this purpose the head office is treated as a separate segment, since it is almost certain to have a separate bank account (or petty cash float). It is also likely that some segments will incur expenditure which benefits other segments beside itself; it is even possible that a segment might incur expenditure which benefits only other segments. It has already been argued that this classification has little interest from the point of view of financial reporting, although it is sometimes treated as if it has. A second classification which will be useful in clearing up confusion is the nominal or functional classification,

including, for example, interest and board salaries.

The third classification is the traditional allocation scheme. In view of the argument of this chapter that such schemes must be arbitrary, it is hardly suprising that they exist in profusion. For the purpose of discussing such classifications it is useful to distinguish between:

a Cost entries, which are costs which are entered in the prime records of the organisation, such as invoice totals, the salary of a particular employee, etc.

b Cost elements, which are the smallest divisions of a cost entry, or group of entries, to which a separately identifiable benefit can be traced.

Allocation schemes usually begin by excluding (or recognising as a separate category not requiring allocation) cost entries which benefit only one segment. The scheme is then taken up by a variety of methods of allocation. However a cost entry may be made up of separate elements, the benefit of which can be attributed to separate segments. For example, suppose a company buys two widgets, each of which could be purchased separately for £10; receives an invoice (cost entry) for £20; and each widget is used by a different segment. The cost entry benefits more than one segment but, because there is no interaction, each widget is a separate cost element and the elements can be traced to segments without difficulty.

The distinction between the legitimate disaggregation of cost elements, and allocation, in the sense of cutting across cost elements and consequently dividing up the effects of interaction, is vital yet not often recognised. For example, Skousen's classification,[1] which is

---

1 K F Skousen, 'A format for reporting segment profits', Management Accounting (USA), June 1971, pp 15-20.

singled out for mention by the Financial Accounting Standards Board, having first dealt with 'directly associated costs' (roughly, cost entries attributable to a single segment), then introduces the category of 'objectively traceable costs', which are:

> 'Costs that are not incurred solely for, or identified with, a single [segment] but which have a high degree of correlation with [segmental activity]. This classification is generally based upon physical identification by count, observation, or some other measure that shows a relationship between the cost and the products for which the costs are incurred. Examples of these kinds of costs are the costs of painting, packaging, and other similar items.'[1]

It is not clear whether these costs can be traced to segments because they are cost entries composed of several cost elements, or whether an arbitrary allocation scheme is being proposed. Skousen goes on to distinguish a further catogory of 'ascribable costs' which are:

> 'Costs for which there is not an objectively traceable basis for assignment to particular products or services. However, these costs do have an observable relationship between the cost incurred and the cost objective, and therefore can be ascribed to that cost objective on some basis, such as floor space used, ton miles of transport, or size of task.'[2]

Such costs may be able to be allocated rationally but seem more likely to require arbitrary allocation. The final category in Skousen's scheme is 'generally allocable costs' which have been allocated 'by convention or agreement'.[3]

As a further example of confusion, the work of Backer and McFarland[4] can

---

1 Skousen, p 17.

2 Skousen, p 17.

3 Skousen, p 17.

4 M Backer and W B McFarland, External reporting for segments of a business (New York: National Association of Accountants, 1968).

be considered. They advocate the reporting of contribution margins:

> 'Contribution margin reporting proceeds by assigning to each segment the revenues and costs for which that segment is solely responsible. Those are, in other words, the separable revenues and costs. A practical test is that the separable costs would not be present in the absence of [the segment in question] with all other conditions remaining the same.'[1]

The first sentence implies that only costs without Thomasian commonalities will be allocated, yet the 'practical test' suggests, if separable costs are to be all costs which 'would not be present in the absence of the segment', that separable costs will represent the incremental costs of the segment.[2] Further, the example offered by Backer and McFarland[3] uses a nominal classification, implying that common costs can be identified by the nature of the cost object: in this case such costs include administration, research and development, interest and taxation. It seems unlikely that the absence of a segment would leave the group's interest and tax charges unaltered.

5.4 THE IDENTIFICATION OF COMMONALITIES

Descriptions of the orthodox model often imply that commonalities can be readily identified. The Financial Accounting Standards Board, for example, speak of costs which are 'not directly traceable'[4] to a segment without defining traceability, or distinguishing between direct and indirect

---

1 Backer and McFarland, pp 29-30.

2 This point is given more detailed treatment in chapter 6.

3 Backer and McFarland, p 30.

4 SFAS 14, paragraph 10.

traceability, still less offering some test or criterion by which traceability could be judged. In some cases it will be easy to identify common costs; headquarters expenses are, in the main, likely to fall in this caregory. However, the characteristics of Thomasian commonalities include pervasiveness and difficulty of identification.

Consider, for example, the case of a two-segment group, with activities in some relatively stable manufacturing sector such as brewing, and commodity-broking. Depending on the perceptions of the lender, the commodity broking division may be charged a lower rate of interest because of the asset-backing provided by the manufacturing division. The confidence provided by this backing may also be reflected in the willingness of others to do business with the broker; the size of the accounts the broker is permitted to accumulate; and in other factors affecting the revenues, costs and opportunities of the brokerage segment. These interaction effects are the product of the joint existence of the two segments: consequently they generate 'common' costs and revenues. Under the conditions postulated, it may well be that the majority of the costs and revenues of the broker will be common. If the parties who deal with the manufacturing segment are sufficiently alert to the risks involved, and if the institutional structure links the riskiness of the two segments to any material extent, it may be that some or all of the costs and revenues of the manufacturing segment will also be affected.

How easy will it be to detect the existence of these commonalities? In many cases, the goods and services which the elements of cost represent do only benefit one segment. To test for commonality by asking, as Lamb asks, are there 'costs which relate to more than one of the lines of

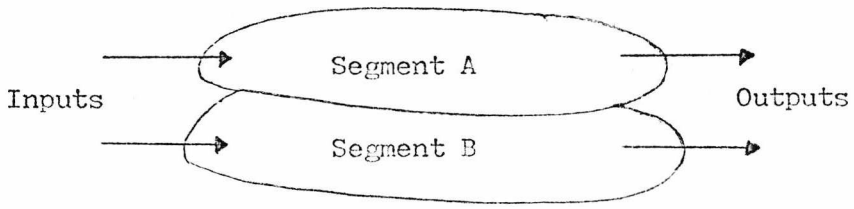
business carried on',[1] may not, consequently, be sufficient. In the case cited, many of the costs will relate to one segment, in the sense of being incurred for the acquisition of goods and services which will benefit only one segment, but the quantum of the costs will be affected by commonality.

The connection which gives rise to the commonality arises outside the organisation. In the language of systems theory, it is located in the environment of the organisation. This is what will make it so hard to detect. Figure 5.1 illustrates the point. It shows a two-segment organisation. In figure 5.1(i), the inputs and outputs of the two segments are independent; in figure 5.1(ii), there are 'traditional' interactions which take place within the organisation; figure 5.1(iii) shows interaction of the kind discussed in the preceding paragraphs.

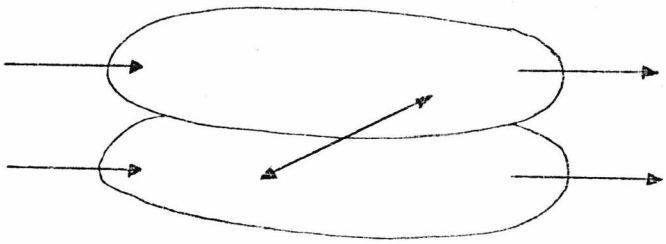
The identification of some types of commonality arising within the organisation may pose substantial problems. It has already been argued that the location of the burden of the cash flow will not be a satisfactory guide; neither will the nature or origin of the cost be adequate. In cases where the connection is external to the organisation, as in the case above, where the interaction flows through the perceptions of external parties, the interaction will be extremely hard for the accountant, and, a fortiori, for the auditor, to detect.

---

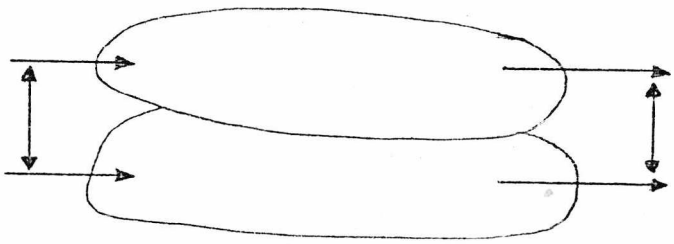
1 Lamb, p 45.



(i) No interaction



(ii) Traditional interaction



(iii) External interaction

Figure 5.1: Traditional and external interaction

5.5 MATERIALITY

Materiality arises in the discussion of commonalities in the orthodox model in two ways. A test is sometimes proposed of the amount of interaction which will invalidate segmental data. Mautz reported the attitude of analysts that,

> 'the point at which segmental profit figures lose their significance because of the influence of common costs is 10% of sales or less.'[1]

Alternatively, it is sometimes asserted that commonalities, although they may exist, will not be material. Lamb, for example, concludes that,

> 'we think it will be rare that head office expenditure is of such significance that it makes the information disclosed as to lines of business misleading.'[2]

In practice, the nature of allocations is such that it would be very difficult to demonstrate the validity of general propositions about their scale, or to apply in particular cases the kinds of tests envisaged in the orthodox model.

5.6 THE PERVASIVENESS OF COMMONALITIES

The orthodox model recognises interaction between costs, without, perhaps, recognising the extent to which cost interaction exists. However, the existence of Thomasian interaction is not limited to costs but may extend to revenues, assets and liabilities and even to non-financial measures such as number of employees.

---

1 Mautz, p 152.

2 Lamb, p 67.

Some examples of each kind may be considered. A group sells, inter alia, food products and consumer durables. A major chain store purchases large quantities of the group's food products for sale in its stores and operates an employees' discount scheme through which, from time to time, an employee purchases one of the group's consumer durables. The store insists that the large discount which it obtains on food should be extended to its purchases of consumer durables, although they are not of a scale to earn comparable discounts in isolation. The revenue of the consumer durable division will suffer (unless some form of internal compensation takes place within the group) in order to sustain the revenue of the food segment. This is an example of 'negative' revenue interaction; it is not difficult to think of examples of positive interaction of revenues. A segment which sells insurance, for example, may obtain additional revenues from other segments of the group, as well as from third parties who are influenced by the existence of other segments of the group, as when a shipping line supplies its brochures together with tickets.

As for assets, the orthodoxy is often prepared to recognise some degree of interaction, and the consequent need for allocation:

> 'In companies where production, distribution or administrative facilities are shared by two or more lines of business, it may be difficult to allocate fixed assets on a meaningful basis.'[1]

However, the extent of interaction is much greater than suggested. In section 5.4 the case of a brokerage segment combined with a manufacturing segment was considered. The benefit of the manufacturing segment's fixed assets would be regarded in the orthodox model as attaching exclusively to the manufacturing segment. Yet in the example, the assets are also providing a 'benefit' (in the form of security) to the brokerage

---

1 Lamb, p 47.

segment, and the return to that segment would need to be related to the investment in that segment including the effect of the security.

Perhaps the most obvious example of the need to allocate non-financial measures would be the treatment of the main board of directors in a segmental breakdown of employees. Such problems need not be insignificant, as, for example, where there is substantial capacity shared between segments.

Appendix 5.1

THE ALLOCATION PROBLEM AND THE WORK OF A L THOMAS

This appendix comments briefly on Thomas' contribution to the literature. Thomas' attack on the structure of conventional allocation processes is not, of course, without precursors. Canning wrote:

> '... the allocation of a total sales income among the material objects and persons whose services, as a totality, will have brought in this revenue, cannot be made except upon a basis largely arbitrary.'[1]

However, much the most important contribution to the literature on the allocation problem is that of Arthur L Thomas. The greater part of Thomas' argument is contained in his two Studies in Accounting Research for the American Accounting Association,[2] although he has written several articles expanding and 'popularising' his ideas,[3] and his basic textbook[4] incorporates some elements of his conclusions. His early work received considerable acclaim; for example Rosenfield, in reviewing the first

---

1 J B Canning, The economics of accountancy (New York: Ronald Press, 1929), p 41.

2 Thomas, 1969; and Thomas, 1974.

3 Including A L Thomas, 'Transfer prices of the multinational firm:when will they be arbitrary?' Abacus, 1971, pp 40-53; A L Thomas, 'Useful arbitrary allocations (with a comment on the neutrality of financial accounting reports)', Accounting Review, 1971, pp 472-79; A L Thomas, 'The allocation fallacy and financial analysis', Financial Analysts Journal, September/October 1975, pp 37-41 and 68; and Thomas, 1975, 'The FASB and the allocation fallacy'.

4 Thomas, 1972.

Study, described it as 'a most important contribution to the literature of financial accounting'.[1] However its implications were largely ignored, and the second Study lists some major contributions to the literature which appeared after the first Study, yet which conflict with his findings, without refuting them, or even, indeed, mentioning them.[2] The second Study has been more widely used in the theoretical literature, although the popular literature (and sections of academic writing) continue to treat allocation generally as a non-arbitrary process without refuting Thomas' logic.

---

1 P Rosenfield, Review, Accounting Review, 1970, p 825.

2 Thomas, 1974, pp 145-55.

Chapter 6

SEPARATE DISCLOSURE OF THE INTERACTION EFFECT AND THE RANGE OF AMBIGUITY

6.1 SEPARATE DISCLOSURE OF THE INTERACTION EFFECT

6.1.1 Introduction

It has been argued that the traditional FDDO model fails because it cannot handle the degree of interaction which occurs in even the most diversified group. As Schachner puts it:

> 'If a product sector were an independent company, it would have its own top administration - with the attendant expenses proportionately higher and the level of services available probably lower in quality and scope. These are, of course, some of the economies which make the diversified firm a viable enterprise. Economies of size manifest themselves not only as technological economies but also as managerial economies and are derived from managerial division of labour and from reduced costs as a result of large scale financial transactions.'[1]

Under these circumstances, it has been argued, allocations will have no referents in the real world. Thomas[2] has suggested, however, that 'it may be possible to discuss an input's separate effects (those contributions that it would make were it divorced from all other inputs) and refer to something external'.[3] In this section the possibility is discussed that a reporting model could be constructed which would employ these separate or independent effects in a satisfactory way.

---

1 L Schachner, 'On the apportionment of "central" expenses', The New York Certified Public Accountant, 1967, p 684.

2 A L Thomas, The allocation problem: part two (Studies in Accounting Research Number 9) (Sarasota, Florida: American Accounting Association, 1974).

3 Thomas, p 54, emphasis supplied.

6.1.2 Defined profit

Some authors, for example Kemp,[1] have suggested that diversified companies should report segmental contribution margins, apparently as an attempt to eliminate allocations from segmental reports. After considering several alternative measures, Kemp recommends the adoption of 'contribution margin in excess of directly assignable expenses'. He considers that,

> 'This basis of reporting eliminates both the practical and conceptual objections to reporting net income by segments. Since expenses incurred by the company as a whole are not allocated to segments, but are reported as company-wide expenses, the myriad problems of expense allocation are avoided entirely. Furthermore, it is perfectly logical to assume that segments can make a contribution toward covering company-wide expenses and providing a net income for the company, even though they cannot earn net income (or sustain net loss) on their own.'[2]

The example of a contribution margin report provided by Kemp is shown in figure 6.1. The concept is also referred to, for example by Mautz,[3] as 'defined profit', a term which, despite its generality, will be preferred here, for reasons which will become apparent.

It has been argued that lines in an accounting report should be susceptible of some conceptual meaning to be read from left to right. This cannot be provided by a number which is simply a sub-total; there must be some external reference for that number. If the defined profit is obtained simply by showing costs which do not require to be allocated 'above the line' and by relegating all costs which benefit more than one segment 'below the line', and there is no other criterion for the distinction, it

---

1 P S Kemp, 'Contribution margin reporting for diversified companies', Management Accounting (USA), May 1968, pp 14-17.

2 Kemp, p 17.

3 R K Mautz, 'Conglomerate reporting and data reliability', Financial Executive, September 1967, pp 25-26, 31, 33-35.

Contribution margins (Ø000's)

	Segment X	Segment Y	Segment Z	Total company
Revenues	100	150	200	450
Directly assignable expenses	60	100	170	330
Contribution margin	40	50	30	120
Company-wide expenses				80
Net income				40

Source: Kemp, p 17.

Figure 6.1: A contribution margin report

is difficult to see what meaning 'defined profit' can have. The concept is certainly not analogous to the management accountant's concept of the contribution.[1] Such a concept requires not only that the costs and revenues reported above the line should be independent, but also that the level of costs shown below the line should be independent of the scale and number of segments ('across-the-line' independence).

There is no reason to suppose that across-the-line independence will prevail. If it does not, the normal rationale for the contribution margin disappears. Consider the group shown in figure 6.2. If the defined profit were taken to be a contribution margin in the management accounting sense, it would not benefit the group to drop segment 3, because it has a positive defined profit; in Kemp's terms it will 'make a contribution towards covering company-wide expenses and providing a net income for the company.'[2] But suppose that 'company-wide expenses' include such head office functions as legal and financial advice, market research and share registration. It is unlikely that the level of expenditure on such items will be independent of the number and sizes of the segments; if the group excluding segment 3 would incur such expenditure to the amount of £80 000 only, then it would benefit the group to drop segment 3, as shown in the second part of figure 6.2, since the cost savings below the line exceed the loss of defined profit. Hence defined profit does not show the marginal contribution of particular segments to group results.

---

1 See, for example, C T Horngren, Cost accounting: a managerial emphasis (3rd edition; Englewood Cliffs, New Jersey: Prentice-Hall, 1972), p 35.

2 Kemp, p 16. The argument is based on the assumption that the performance will be repeated in the future. The use of any other reporting model, for example using discounted cash flows, does not upset the conclusion, however.

Defined profit

£000's

	Segment 1	Segment 2	Segment 3	Group
Sales	300	200	100	600
Above-the-line costs	150	120	95	365
Defined profit	150	80	5	235
Below-the-line costs				100
Group profit				135

(i) Defined profit and group profit with Segment 3

Defined profit

£000's

	Segment 1	Segment 2	Group
Sales	300	200	500
Above-the-line costs	150	120	270
Defined profit	150	80	230
Below-the-line costs			80
Group profit			150

(ii) Defined profit and group profit without Segment 3

Figure 6.2: Defined profit and the termination of a segment's activities

It would, of course, be possible to report contribution margins for individual segments; some of the efforts of central management, for example, are directed towards examining the possible acquisition of new segments (or even the termination or divestment of established segments) and these expenses provide no benefit to established segments, but must be covered from segmental profits. It is clear, however, that this concept is quite different from defined profit, and extensive allocations must be made before it can be calculated, since the elements of defined profit which are expended for the benefit of established segments will have to be eliminated. Further, the contribution margin is not likely to be materially different from group profit, since expenses of the kind specified above are likely to be small. A proper appraisal of the level of these expenses would in any event require interaction effects to be shown separately, since it is the savings from interaction which justify the existence of the diversified group and hence the group expenses which are incurred over and above the expenses necessary for the operation of the segments. It is argued elsewhere that it may be useful to disclose these costs separately, even if they are not, by normal standards, material.

The literature of defined profit frequently assumes that interactions will be easy to identify, frequently by some form of functional classification. Kemp states that 'expenses incurred by the company as a whole are not allocated to segments',[1] implying that the nature of the transaction will identify a commonality, whilst in the Mautz study,[2] 'common costs were defined ... by specifically listing certain items of expense.'[3] Thus it would be possible to describe below-the-line expenses by reference to some

---

1 Kemp, p 16.

2 R K Mautz, Financial reporting by diversified companies (New York: Financial Executives Research Foundation, 1968).

3 Mautz, 1968, p 148.

characteristic other than their commonality, for example as head office expenses. If this were so, it would at least provide a basis for establishing a defined profit which would have an external meaning and be able to be enforced by standard. It has been suggested, however, that that the nature of segmental interaction is highly complex, and that interactions are not necessarily limited to particular categories of revenue and expense. Thus the only unifying characteristic of below-the-line expenses will be that they include cost elements which are subject to interaction (that is, which yield a benefit to more than one segment), although, of course, they will not be limited to the measure of the interaction effect.

Two examples may clarify this point. Suppose that segments A and B obtain most of their legal advice from a head office solicitor, whereas segment C employs its own legal staff. The cost of the head office solicitor is common and will therefore be shown above the line, whereas the cost of C's solicitor will be borne by the segment. The rationale for the distinction is based solely on the particular nature (common or independent) of the cost elements; it is not possible to describe below-the-line costs functionally - that is, as including or excluding legal costs. If segment A were to obtain some legal advice from outside the group, the amount of the cost would be charged against the segment, and the situation would be complicated still further.

Now consider a case in which segment A obtains a discount from a major supplier because the total purchases from that supplier by the group (including purchases by segment B) exceed a certain level, which would not be exceeded by segment A alone. This is an interaction effect to be found above the line which is normally established for defined profit. The cost

of these supplies could, of course, be carried below the line and this would preserve the nature of defined profit as being allocation-free. It does, however, suggest that defined profit will be difficult to interpret. It also means that any attempt to establish a functional meaning for defined profit by carrying below the line all types of cost (and revenue) which could be subject to interaction would leave very little, if anything, above the line.

If, in designing a segmental reporting model, we are to agree with Schachner that 'clarity of cost assignment cannot be a dominant factor',[1] the defined profit concept appears to have little value.

6.1.3 Line-by-line disclosure of interaction effects

It is time to formalise the concept of the interaction effect. Thomas, in discussing the allocation of revenues to inputs, suggests that,

> 'It is convenient to distinguish between an input's separate effects on output, revenues or cash-flows and interaction effects. The former, which frequently will be zero, are the contributions that the input would make if it operated in isolation from all other inputs. Interaction effects are what remain after all separate effects have been identified, and are the joint results of inputs working in concert.'[2]

These concepts have been taken up by Moriarity[3] for management accounting purposes. He is actually seeking an allocation procedure,[4] but as a preliminary stage to the allocation, he requires that a firm should

---

1 Schachner, 1967, 'On the apportionment of "central" expenses', p 684.

2 Thomas, p 19, emphasis supplied.

3 S Moriarity, 'Another approach to allocating joint costs', Accounting Review, 1975, pp 791-95.

4 He actually constructs an allocation procedure which yields sterilised allocations (see chapter 7) for certain purposes.

calculate, 'the costs that would be incurred if the products or services were obtained independently.'[1] Henceforth we shall describe this concept as the independent effect.

Following the ideas of Thomas and Moriarity, we shall define the independent effect of a particular category of a segment's revenue or expense as the level of that revenue or expense which would prevail if the segment were operating as a separate, unitary, entity. Defined in this way, independent effects can be disclosed category by category.

Schachner[2] adopts a notion of incremental central expenses to be employed for segmental disclosure which appears to resemble the idea of independent effects:

> 'These expenses cover services which the sectors would have to purchase outside, if they were not provided by the staff or service departments located at corporate headquarters.'[3]

It is clear, however, from Schachner's analysis that his incremental expenses differ from independent effects in several essential ways. First, they are still identified primarily by function, as the central expenses incurred at corporate headquarters. Secondly, Schachner appears to believe that the sum of incremental expenses can be made to equal the aggregate costs incurred by the group:

> 'The costs of these services ... can be charged to sectors in a manner that would roughly equate the charges made with

---

1 Moriarity, p 792.

2 L Schachner, 'Corporate diversification and financial reporting', Journal of Accountancy, April 1967, pp 43-50.

3 Schachner, 1967, 'Corporate diversification and financial reporting', p 49.

the costs of the services rendered.'[1]

As Kemp points out, this opens incremental expenses to the charge that they are 'merely a type of allocation, using as the allocation base relative use of the services represented by each expense.'[2]

Thirdly, Schachner takes as a separate category of cost, 'central costs, theoretically not identifiably incremental',[3] which he recommends should be 'charged to product sectors ... although not directly related to their activities.'[4] As suggested in the previous section, there may well be such expenses, but Schachner's functional classification extends to expenses which do in fact benefit segments. For example, he lists interest as such an expense, yet it is clear that, whilst interest cost may not be traceable to individual segments, a segment operating independently would have to incur a cost of capital.

To report segmental interaction effects is to abstract from the wider problems of interaction. Put generally, the interaction effects due to any particular scheme of disaggregation are calculated in terms of whatever model is used for determining aggregate values. Thus, for example, the allocation problem to which Thomas devotes his attention, namely the allocation of the cost of long-lived assets over time as depreciation, is treated for each individual segment by whichever method is adopted for the group. The consequences of this abstraction are discussed in chapter 7.

---

1 Schachner, 1967, 'Corporate diversification and financial reporting', p 49.

2 Kemp, p 16.

3 Schachner, 1967, 'Corporate diversification and financial reporting', p 49.

4 Schachner, 1967, 'Corporate diversification and financial reporting', p 49.

6.1.4 The architecture of line-by-line disclosure

Figure 6.3 shows a simple example of line-by-line disclosure of the interaction effect. Sales revenues are independent, and all independent costs are grouped together as 'direct costs' although these could have been broken down by category. In addition the group incurs headquarters expenses of 20; if segment 1 were to operate idependently it would have to spend 15 on these services, whereas segment 2 would spend 8. Thus there is a cost saving, or interaction effect, of 3. This is shown separately in the cost line and consequently as an addition to profit. It would be possible, in turn, to divide headquarters expenses by some narrower functional classification without the need for allocation.

Figure 6.4 shows a more complex interaction effect. The conventional results of the group are shown in figure 6.4(i). It is known, however, that all the output of both segments is sold to a large customer (say, the government), who has demandedand received a discount from the group of 5% because of the volume of trade. If the group refused to allow the discount, the customer would continue to buy from segment 1 at the higher price, but would buy the product manufactured by segment 2 elsewhere. This segment would then have to cut its prices by a further 10% and would still suffer a 25% reduction in the volume of its trade.

Figure 6.4(ii) shows these interaction effects. If segment 1 were independent, it could sell its output for 316 (ie 300 x 100/95); segment 2 could sell only 135 (ie 200 x 90/100 x 75/100). Thus the interaction effect on revenue is:

	Segment 1	Segment 2	Interaction effect	Group
Sales	300	200		500
Direct costs	200	170		370
Headquarters expenses	15	8	(3)	20
	215	178	(3)	390
Profit	85	22	3	110

Figure 6.3: A simple interaction effect

	Segment 1	Segment 2	Interaction effect	Group
(i) Conventional results:				
Sales	300	200		500
Costs - variable	250	140		390
fixed	20	20		40
	270	160		430
Profit	30	40		70
(ii) Independent and interaction effects:				
Sales	316	135	49	500
Costs - variable	250	105	35	390
fixed	20	20		40
	270	125	35	430
Profit	46	10	14	70

Figure 6.4: A complex interaction effect

Segment 2's gain:	200 - 135 =	65
Segment 1's loss:	316 - 300 =	16
		49

With a 25% loss in volume of sales, segment 2's variable costs would amount to only 105 (ie 140 x 75/100). Thus the interaction effect is 140 - 105 = 35. The net interaction effect on profit is thus 14. It might be argued that this should be credited to segment 1 because it is that segment's agreement to allow the discount which earns the effect for the whole group. However, the sacrifice which this segment makes in so doing (ie 16) has already been made good by crediting it with the independent value for the sales. Furthermore, the existence and operations of segment 2 are also essential to obtain the interaction effect, yet, because the effect is calculated by the incremental route, the fixed costs of each segment are ignored.

The final example shows one category of expense only, for a group with three segments. As well as the independent costs of each segment shown separately (the first column of figure 6.5(i)), we now need to consider also the costs of each pair of segments operating without the third. By comparing the total independent costs for each pair with the actual costs which a group consisting of that pair would incur, the interaction effect for the pair can be obtained. The balance of the total interaction effect after removing the interaction effect of each pair is attributable to the combined affect of all three segments. Figure 6.5(ii) shows an extract from the relevant segmental report: for a group with three segments there are four interaction effects.

The number of potential independent and interaction effects can be

(i) Interaction effects:

Segment(s)	Total independent costs	Aggregate costs	Interaction effect
1	6		
2	5		
3	4		
1 and 2	11	10	1
1 and 3	10	8	2
2 and 3	9	8	1
			—
			4
Group (1 and 2 and 3)	15	10	5
			—
Effect of interaction of all three segments			1
			—

(ii) Extract from segmental report:

	Independent effects:			Interaction effects:				Group
Segments:	(1)	(2)	(3)	(1,2)	(1,3)	(2,3)	(1,2,3)	
Category of expense	6	5	4	(1)	(2)	(1)	(1)	10

Figure 6.5: One category of expense with three segments

calculated as follows. For any number of segments, n, the number of potential interaction effects arising from pairs of segments equals the number of ways of combining pairs from n segments. The general formula for the number of ways of combining r objects from n is as follows:[1]

$$ {}_{n}C_{r} = \frac{n!}{(n-r)!r!} \qquad (6.1) $$

There will also be potential interaction effects from combinations of three and more segments, up to r = n. Hence the total number of interaction effects from n segments (I_n) is:

$$ I_n = \sum_{r=2}^{n} \frac{n!}{(n-r)!r!} \qquad (6.2) $$

The total number of separate items of data to be reported (R_n), including the n independent effects as well as the interaction effects is therefore given by:

$$ R_n = \sum_{r=1}^{n} \frac{n!}{(n-r)!r!} \qquad (6.3) $$

Values of I_n and R_n for values of n from 1 to 15 are shown in table 6.1. The numbers quickly become very large.

This section has considered examples which demonstrate that for two dimensions of diversification, namely sources of interaction and number of segments, the complexity of segmental reports showing interaction effects separately increases very rapidly. Even in relatively simple cases, the architecture of segmental reporting is likely to be highly complex.

---

1 J Tennant-Smith, Mathematics for the manager (London: Nelson, 1971).

Table 6.1

Values of I_n and R_n

n	I_n	R_n
1	0	1
2	1	3
3	4	7
4	11	15
5	26	31
6	57	63
7	120	127
8	247	255
9	502	511
10	1 013	1 023
11	2 036	2 047
12	4 083	4 095
13	8 178	8 191
14	16 369	16 383
15	32 752	32 767

6.2 THE RANGE OF AMBIGUITY OF ALLOCATIONS

6.2.1 The range of ambiguity

Thomas argues that,

> 'If a group of inputs interact, we might assign equal portions of the interaction effect to each input, assign all of it to one input, assign all of it to a different input, or, generally, make any allocation of the interaction effect that we wish with as good a justification as any other. As a result, the annual contributions calculated from any one input could include anywhere from none to all of each year's interaction effects.... As far as I have been able to tell, this freedom in assigning interaction effects is limited in only one way: we may be able to set upper limits to the amount of the interaction effects legitimately attributable to each input - one could argue that an input's total contribution to a firm during a year cannot possibly exceed the reduction in the firm's net cash inflows for the year that would result from the firm's being deprived of that input.'[1]

Bearing in mind that Thomas is dealing with one particular allocation problem, namely the allocation of revenues to inputs, and that this study is, for the moment, concerned only with the interaction effects arising from one particular scheme of disaggregation, we can reformulate Thomas' principle. The interaction effects arising in any particular scheme of disaggregation may be allocated amongst the components of the scheme in any way, subject to the limitation that the total contribution of any particular component (including its independent effect, if any, and the interaction effects allocated to it) may not exceed the reduction in the aggregate under consideration if the component were removed. Thomas calls this the incremental contribution.

The incremental contribution can be calculated by adding to the component's independent effect, all the interaction effects to which that component

---

1 Thomas, p 22.

contributes. It can also, of course, be calculated directly, by examining the consequence for the entity of removing the component under consideration. It is easy to see the equivalence of these two formulations, since it is precisely the interaction effects to which a component gives rise which will (together with the component's independent effect) be lost if the component is removed.

Of course, if the interaction effects caused by, for example, two segments are allocated to both those segments, the total contribution of all segments will exceed the aggregate for the group. This contravenes generally accepted accounting principles, and if it is to be avoided, an additional external constraint will have to be imposed.

Thomas describes the amount of arbitrariness present in an accounting number due to the inclusion of interaction effects as 'ambiguity'. The range of ambiguity of an accounting number is, 'for a particular input and year, the difference between the highest and lowest contribution that could be calculated for that input.'[1] Again, this can be generalised. The range of ambiguity (A) of a component in a scheme of disaggregation is the difference between the highest and lowest contributions that can be attributed to that component. The range can be expressed as a coefficient (α) by dividing the difference between the limits of the range by the smaller of the absolute values of the two limits.

---

1 Thomas, p 29.

6.2.2 The calculus of ambiguity

Table 6.2 shows the ranges and coefficients of ambiguity for the segmental information set out in figure 6.3. Taking the headquarters expenses of segment 1 as an example, the highest figure for these is the independent effect, 15, whilst the lower figure of 12 is arrived at by allocating all the interaction effect to segment 1. This is the incremental contribution: if segment 1 were removed, the group's headquarters expenses would fall by only 12 (from 20 to 8), since the opportunity to reap economies of scale would be lost. The coefficient of ambiguity is calculated thus:

$$\alpha = \frac{15 - 12}{12} = 0.25$$

If the additional requirement that the total of the segments' allocations is to equal the aggregate for the group is to be met, then the determination of each segment's contribution is not independent of the determination of the contributions of the remaining segments. For example, if segment 2's profit is to be 23, segment 1's profit must be calculated by deducting this from the group's profit. If is not possible to select any profit from the range shown for segment 1.

The value of α for headquarters expenses is determined by the economic structure of those expenses, but the value of α for total costs and profits depends on the relationship of headquarters expenses to total expenses. Thus a quite small range of ambiguity in total costs produces a large range of ambiguity in profit. This is, of course, analogous to the well-known effect of small changes in total costs having substantial consequences for profit.

Table 6.2

Ambiguity with a simple interaction effect

	Segment 1:		Segment 2:	
	A	α	A	α
Sales	300 - 300	0	200 - 200	0
Direct costs	200 - 200	0	170 - 170	0
Headquarters expenses	12 - 15	0.250	5 - 8	0.600
Total costs	212 - 215	0.014	175 - 178	0.017
Profit	88 - 85	0.035	25 - 22	0.136

There is no assurance that allocations determined by conventional methods will fall within the range of ambiguity. In this instance, for example, if headquarters expenses had been allocated in proportion to sales, the allocation would have fallen at the limit of the range,[1] whereas an allocation in proportion to direct costs would fall outside the range.[2]

The ambiguity present in the complex interaction shown in figure 6.4 is calculated in table 6.3. It is interesting to note that if the generally accepted accounting principle that profit should be calculated as sales minus costs is to be observed, the range of ambiguity of profit limits the extent to which sales and cost interaction effects can be loaded on individual segments. It is not acceptable for example, to load all the favourable sales interaction on segment 1 and all the unfavourable cost interaction on segment 2. To do so would yield a profit for segment 1 of 95 (ie 365 - 270), which lies outside the range. It is nonetheless possible to make several different sales and cost allocations to arrive at any particular profit, as table 6.4 demonstrates.

One possible solution to the allocation problem might be to allow allocations to be made where the component of a scheme of disaggregation can be determined within a specified range of ambiguity. Figure 6.6 shows the figures for a group operating under an accounting standard which allows allocations to be made where α is less than 10%. Part (iii) gives one possible pattern of allocations. Some items of data must be suppressed, but it can occur, as it does in this instance, that a

---

1 20 x (300/500) = 12.

2 20 x (200/370) = 10.8.

Table 6.3

Ambiguity in a complex interaction

	Segment 1: A	α	Segment 2: A	α
Sales	316 - 365	0.155	135 - 184	0.363
Costs	270 - 305	0.130	125 - 160	0.280
Profit	46 - 60	0.304	10 - 24	1.400

Table 6.4

Two possible allocation patterns for the numbers in table 6.3

	Segment 1	Segment 2	Group
Pattern 1:			
Sales	330	170	500
Costs	270	160	430
Profit	60	10	70
Pattern 2:			
Sales	340	160	500
Costs	280	150	430
Profit	60	10	70

	Segment 1	Segment 2	Interaction effect	Group
Sales	300	175	26	501
Costs	250	100	20	370
Profit	50	75	6	131

(i) The independent and interaction effects

	Segment 1:		Segment 2:	
	A	α	A	α
Sales	300 - 326	0.087	175 - 201	0.149
Costs	250 - 270	0.080	100 - 120	0.200
Profit	50 - 56	0.120	75 - 81	0.080

(ii) Ambiguity

	Segment 1	Segment 2	Group
Sales	320	*	501
Costs	260	*	370
Profit	*	80	131

(iii) Disclosure of allocations where the range of ambiguity is below 10%

Figure 6.6: Disclosure within a limited range of ambiguity

suppressed item is the only one in a row or column, and hence a recipient of the statement could calculate a value for the missing item. The value so calculated would fall within the range of ambiguity, but its α would exceed the permitted maximum, thereby defeating the standard. It might also happen that (unless the disclosed items were required to be calculated so as to avoid it) several values for the item could emerge. For example, the profit calculated for segment 1 in figure 6.6 by completing the column (ie 60) differs from that calculated by completing the row (ie 51). A user attempting to interpret the statement in the traditional way would be confused.

If the maximum value of α had to be satisfied by all the items of data in the statement, this problem would be avoided, but of course the likelihood of a group meeting this requirement is correspondingly reduced.

An alternative would be to treat α itself as a useful piece of information and disclose it to show the extent to which segments interact with each other. Disclosing α alone would show the strength of interaction, but not which segments a particular segment interacted with; nor would it disclose the absolute size of the segment. Disclosure of the range of ambiguity would give some idea of the latter.

6.3 THE MEASUREMENT OF INDEPENDENT AND INTERACTION EFFECTS

The arguments of the previous two sections have implicitly assumed that it is possible to identify and measure independent and interaction effects in a diversified organisation in the necessary way. The nature of the commonalities present in even the most diversified of organisations, and the problems of identifying such commonalities have already been discussed;[1] in this section we examine the problems which might arise in the measurement of the separate effects mentioned earlier.

6.3.1 Finance costs

Much the most important of the categories of cost normally recognised in the literature as involving commonalities is the cost of finance. The determination of finance costs for each segment involves:

i Determining how much of each class of capital is invested in the segment.

ii Determining the appropriate cost of each class of capital.

The author's survey suggests that some 25% of companies covered by the survey included the cost of loan but not equity capital as a charge against segmental earnings. This makes defined profit very difficult to interpret without information on the amount of equity capital treated as being invested in each segment. Clearly, the greater the amount of a segment's funds which are regarded as having been provided by loan capital, the greater will be the interest cost to be borne, and the smaller the contribution towards the group dividend and retained profit which can be expected.

---

1 See sections 5.4-5.6.

Loan capital

Schachner offers a bold solution to the problems connected with the treatment of financing costs:

> 'All interest expenses of the corporation should be allocated to all sectors, regardless of how the particular debt is accounted for internal purposes [sic] and its known relationship to certain projects. Objectively, the cost of capital must be the same to all sectors; they all obtain their capital from a common corporate pool.'[1]

Unfortunately, this solution does not accord with the independent-effect approach to segmental reporting. It is true, however, that the sources of loan finance available to a diversified company may (subject to institutional constraints) enter a common pool: frequently, specific inter-segmental loans will be able to be identified, and, even when this is not the case, the complex financial relationship between segments (and especially between individual segments and the head office) will ensure that finance is effectively transferred. Decisions such as the level of dividend to be passed up to the holding company, who is to benefit from tax set-offs, and the timing of payments for services provided by head office effectively involve the transfer of funds between segments. The existence of these transactions means that we cannot use the explicit pattern of inter-segmental lending as a guide to the incidence of benefit, even where such a pattern exists.

Consider the case of a relatively risky segment (compared, that is, to the group), which raises loan capital. If the lender is unaware that the business is part of a group, or if he believes that the group may rely on the shield of limited liability in the event of difficulty, he will presumably charge a rate of interest which reflects the risk character-

---

1 Schachner, 1967, 'On the apportionment of "central" expenses', p 685, emphasis added.

istics of the segment, and if the segment uses the capital it should treat the external cost as its cost of capital. If, however, the lender treats the loan as being made to the group as a whole, the price of risk will be lower and yet this should not be reflected in the independent effect of the segment. It is either (a) part of the interaction effect of the group, or (b) attributable to the lessrisky segments which are, in effect, underwriting the activities of the risky segment. Which of these applies, or rather, the extent to which each of these applies, will depend on such considerations as whether the group would in fact rely on the shield of limited liability, and the extent to which the lender's and the group's perceptions of risk differ. The total interaction effect for the group may be east to identify, by establishing the independent costs for each segment and comparing the total of these costs with the actual aggregate for the group. There will usually be some cost savings for the group, arising from economies of scale, etc. For much of the analysis described in the earlier sections of this chapter, however, the interaction effect attributable to each sub-group of segments must be known, and this will be much more difficult to measure.[1]

In certain instances the formal structure of the loan may cross segmental boundaries. Consider, for example, the case introduced in section 5.4: a segment in a risky business with little property (commodity broking) obtains funds at a cheaper rate by securing a loan on the property of another segment which does not need to use its asset backing itself. In this case the existence of the interaction effect is easy to identify but may still be difficult to measure. The following measurements would need to be made:

i The independent cost to the broking segment of a comparable unsecured

---

1 The question of risk diversification is dealt with much more fully in chapter 9.

loan.

ii The margin which the other segment would receive from raising the same loan against the security of its assets and lending this to an independent borrower of comparable riskiness to the broking segment.

Any difference beyween these costs and the actual cost of the transaction ought to represent cost savings (otherwise the alternatives should be adopted) and will be disclosed as interaction effects.

Frequently, loans are provided for specific projects or the acquisition of specific assets. This does not mean that they have no effect on the common pool, since they may release funds in the pool for use elsewhere. If funds are in abundant supply, such a loan will presumably only be raised if it is cheaper; under these circumstances it is appropriate to credit the benefit to the segment with the project. Where there is capital rationing and the loan is raised although it is more expensive than the pool, adjustments will need to be made to the segment's cost of capital.

Equity capital

Although all equity capital is provided by a common pool for which a single cost of capital applies (with the exception of minority interests), it will still be necessary to determine 'independent' costs for each segment. The average cost of the group's pool of equity finance will be likely to change if any particular segment is dropped. The problem will be further aggravated by the usual problems of measuring the amount of equity invested in each segment.

6.3.2 Managerial expertise

The time and efforts of central management are taken up in managing the group and its specific components. The independent cost of obtaining the skills applied to individual segments must be established, although there will often be room for dispute about the extent to which the activities of central management benefit individual segments. The costs of managing the group as a whole are more difficult to deal with: presumably most effort is expended in obtaining interaction effects, and the costs of such effort should be charged against the effects obtained. Even effort which is not requited (such as the investigation of potential acquisitions which do not in fact come to fruition) is, in a general way, part of the cost of obtaining interaction effects.

Interaction will not be limited to head office staff: expertise, training etc in the segments may be improved by cross-segmental transfers.

6.3.3 Central facilities

The facilities which are in fact provided centrally, but which would otherwise need to be obtained externally (including legal, economic and financial advice, share registration and general meeting administration, banking facilities, market research, corporate advertising etc) are reasonably easy to identify and possibly to measure.

6.3.4 External market forces

An example in section 6.1.4 involves an interaction via external market forces, namely the use by a 'joint' customer of power to enforce discounts on segments which would not offer discounts if operating independently. As discussed in section 5.4, the critical characteristic of this type of commonality is that there is no internal transaction within the organisation to provide a clue to the existence of the interaction. Commonalities of this sort are likely to be very difficult to detect, let alone measure. Such effects might include the use of group size to obtain cheaper purchases, the need to restrict activities so as to avoid anti-trust legislation or other 'political' consequences of size, price control and other economic effects of aggregate size, the ability to influence government, and so on.

6.3.5 Taxation

Normally corporate taxation will be assessed by reference to the (legally determined) profit of individual legal entities, and these should be able to be aggregated to the level of segments, provided that segmental boundaries do not cross the boundaries of legal entities. Where this happens the identification of commonalities will be more complicated. Adjustments between legal entities will be necessary where interaction effects have tax consequences, and where the tax burden of entities is different because of the status of the group, as, for example, if loss reliefs or capital allowances can be used, or used earlier, because they can be set against another entity's profits. Where they could not otherwise have been used at all, there is an interaction effect; otherwise (or if

deferred taxation is employed) there will be complex allocations to be made through time and between segments. The saving in interest because relief has been obtained earlier will represent an interaction effect.

6.3.6 Conclusions

Even if they can be identified and measured, the reporting of commonalities poses considerable difficulties; defined profit, separate disclosure of independent and interaction effects, and allocation within an acceptable range of ambiguity all create difficult conceptual problems.

The discussion in this section suggests that these problems are compounded by difficulties of identification (especially in the cases where the interaction takes place via the environment) and measurement. The measurement problem almost inevitably creates the need to speculate about what might have happened but did not, with attendant problems of auditability.

Wright and Bedingfield[1] examined the attempts by the relevant US tribunals to deal with indirect cost allocation matters in settling disputes over costing for military contracts. They concluded that,

> 'one problem area is the limitations of the practical utility of the benefit concept when applied to costs which are remote from the output cost objective.'[2]

This conclusion may have wide relevance to all segmental reporting.

---

1 H W Wright and J P Bedingfield, 'Benefit as a criterion for indirect cost allocation', The Federal Accountant, September 1973, pp 67-76.

2 Wright and Bedingfield, p 75.

Chapter 7

SOME PROPOSED SYSTEMS OF ALLOCATION

7.1 INTRODUCTION

In this chapter a variety of reporting schemes which employ allocations is examined. The justification for the allocations is often that they will be useful. As chapter 2 explains, it is not the primary objective of this research to pursue usefulness, but it is appropriate that the proposed models should be examined here, both because they have been suggested as responses to the problem of allocation, and because they illustrate the connections between the twin issues of usefulness and verity.

7.2 TWO PRELIMINARY CASES

An early work by Thomas[1] established two categories of useful allocations. The first consisted of 'allocations which are useful for institutional purposes'.[2] This case is essentially trivial in analytical (although not necessarily in practical) terms, and it encompasses allocations which enable entities to satisfy institutional requirements.

The second category contains 'mutually satisfactory allocations'.[3] Such allocations satisfy the requirements of all parties to the allocation. Leaving aside cases in which some parties are satisfied because they are ignorant of the range of possibilities, or of parts of the data base, the

---

1 A L Thomas, 'Useful arbitrary allocations (with a comment on the neutrality of financial accounting reports)', Accounting Review, 1971, pp 472-79.

2 Thomas, 1971, p 474, emphasis suppressed.

3 Thomas, 1971, p 474, emphasis suppressed.

most likely case is that some allocation must be made if a particular state of affairs is to be brought about in which all parties can be made better off than in the next best state. For example, if co-operative use of some facility yields economies of scale, the common costs must be met somehow, and it may be possible to find a set of allocation schemes, all of which leave all parties better off than without the collective use of the facility. Under these circumstances, all parties may agree to use one scheme from the set in the interests of reaping some economies. Some work has been done on establishing game-theoretic rules appropriate to these circumstances.[1] Most of this work is impossible to apply in situations in which (a) the affected parties are numerous and have few common goals, and (b) the consequences of particular allocations are difficult to detect. Thomas concludes that 'the chances of financial accounting developing mutually satisfactory allocations are at a minimum.'[2]

7.3 STERILISED ALLOCATION AND THE OMNISCIENT PATERNALIST

Thomas[3] describes sterilised allocations in these terms:

> 'Let us designate all cases in which choice of a particular allocation method ensures that the allocation does not affect a particular decision as sterilised of the allocation with respect to that decision.'[4]

---

1 See, for example, D L Jensen, 'A class of mutually satisfactory allocations', Accounting Review, 1977, pp 842-56.

2 Thomas, 1971, p 477.

3 A L Thomas, The allocation problem: part two (Studies in Accounting Research Number 9) (Sarasota, Florida: American Accounting Association, 1974).

4 Thomas, 1974, p 42, emphasis supplied.

It is clear from the examples he provides, however, that the distinguishing characteristic of sterilised allocations is not that they do not impinge on decisions, but that they do not disturb desirable outcomes; that is, they impinge on decisions by causing decision-makers to take decisions which have outcomes which have been determined, a priori, to be desirable. Put simply, they lead decision-makers to take 'correct' decisions, if necessary for the 'wrong' reasons. Sterilised allocations are thus a particular case of the general model of omniscient paternalism, which is shown in diagrammatic form in figure 7.1.

The need for omniscient paternalism stems from a behavioural phenomenon: decision-makers are people, who may be unable or unwilling to take the decisions which confront them using the best available data, or the appropriate decision model. It may be that they perceive the data or the model as inadequate (even though they are in fact the best that can be provided), or that they do not satisfy their particular prejudices, or that they find them indigestible. Consequently, they may resort to behaviour which yields sub-optimal decisions. For example, directors may refuse to use discounted cash flow techniques for investment appraisal because they cannot understand them, or because they do not trust the necessary cash flow forecasts. Thus they may fall back on instinct and cruder appraisal techniques, which yield poorer decisions.

The deficiencies of the decision-maker can be overcome by an omniscient paternalist, or some operational approximation thereto. Suppose that for institutional, operational or behavioural reasons, the paternalist cannot implement the decision himself. It may be, for example, that he is legally prohibited from removing the decision from the hands of the decision-maker, or that so doing would have undesirable consequences for the

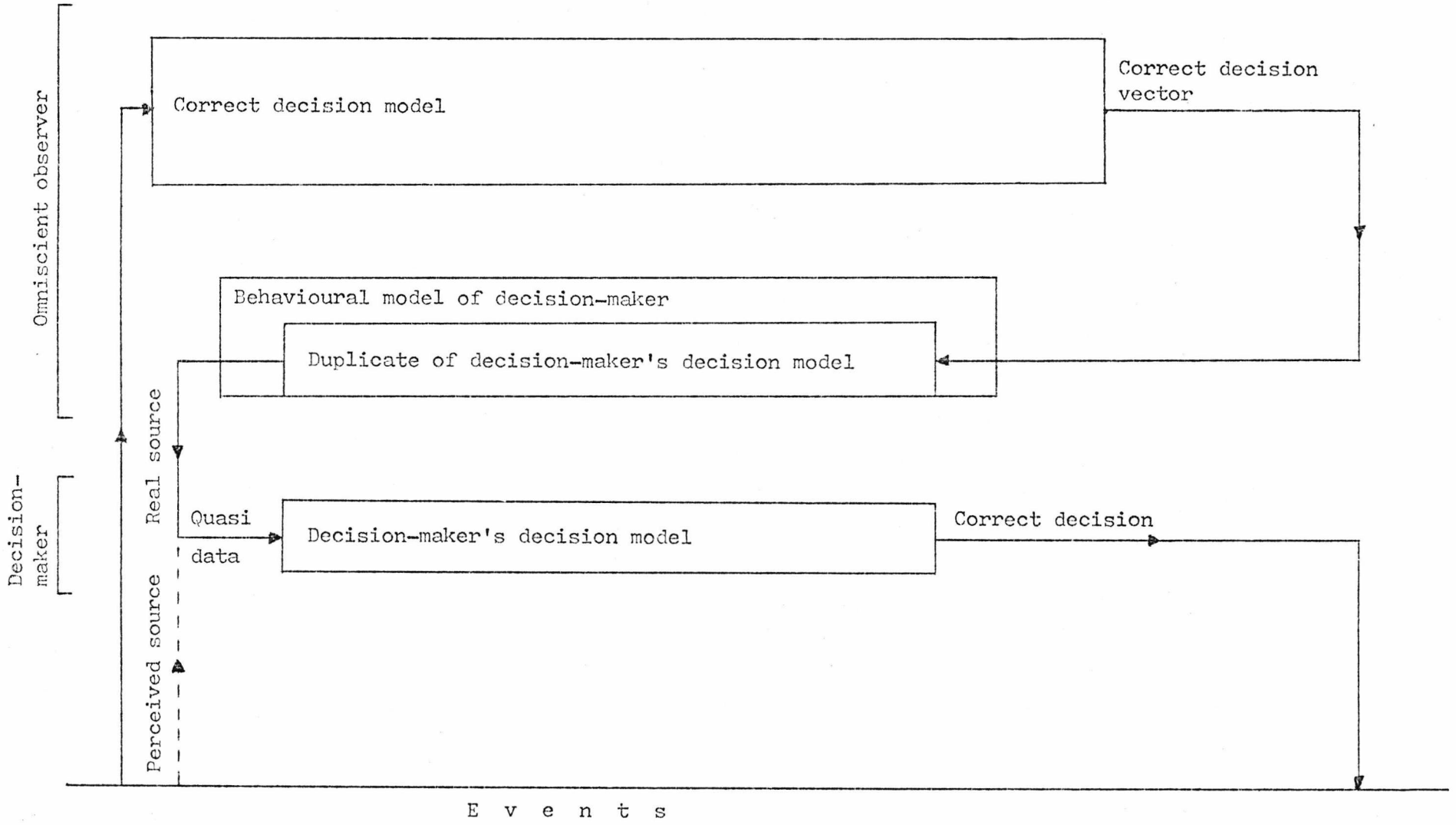


Figure 7.1: Data manipulation by an omniscient paternalist

decision-maker's motivation. In the absence of such considerations, of course, the omniscient paternalist could simply take over the decision-making function himself.

Although he cannot take the decision himself, the paternalist has the appropriate decision model available to him, and he also has the best available data, to which he can apply the model. By so doing he obtains what might be called the correct decision vector. The output of the process need not be a single decision, but may take the form of a series or vector of statements of the form:

If you prefer state X_1, perform act A_1.

If you prefer state X_2, perform act A_2.

etc.

For example, the Xs may describe risk preferences. If the decision model is sufficiently well specified, there will be no need to produce a vector.

The paternalist also knows the decision-maker's decision model, and he must also have a behavioural model of the decision-maker, describing how the decision-maker uses his decision model. The behavioural model must be sufficiently complete to enable the paternalist to 'run the decision model backwards'. The paternalist applies the previously determined decision vector to his copy of the decision model and cranks it backwards to yield as output the data inputs which would have produced the decisions in the given vector. This can be called 'quasi-data'. The quasi-data is passed off on the decision-maker as legitimate data; he applies it to his decision model and 'takes' the 'correct' decision. What he is really doing, of course, is to unveil a decision which has been constructed beforehand, although he will remain blissfully unaware of this.

The operation described above may need to be repeated for each individual decision to be taken. It is to be hoped, however, that decisions can be grouped into sets in such a way that one full operation of the procedures will specify the type of quasi-data needed for the entire set of decisions. One example discussed by Thomas involves the allocation of joint product costs in an absorption costing scheme. The sterilised allocations lead to the same decisions as would be taken using a marginal-cost model. Thomas shows[1] that it is possible to design allocation schemes in such a way that the allocations produced will always be sterilised. Hence, it is not necessary to repeat the full procedure every time an allocation is needed.

The value of a sterilised allocation, then, is that it leads to the same decision as the correct data, properly used. It cannot, however, yield decisions which are better than allocation-free data, properly used. As Thomas so memorably puts it,

> 'Sterilised allocations are recommended only in the way that one might recommend taking a tranquilised skunk to the opera: the animal really doesn't belong there, but if sufficiently tranquilised it may do no mischief.'[2]

7.4 OMNISCIENT PATERNALISM AND SEGMENTAL REPORTS

The complexity of the omniscient paternalism approach, together with the large quantity and range of information needed to operate it, and its general drawbacks (which are discussed below), suggest that extensive

---

1 Thomas, 1974, pp 43-45.

2 Thomas, 1974, p 46.

empirical research would be required to locate an example of sterilised allocation in segmental reporting, and that any such example would be of very limited use. Nonetheless, it is possible to suggest potential instances of sterilised allocations, and these are discussed below.

7.4.1 Redundancy

Positive user-need studies have suggested that analysts require segmental reports, inter alia, to provide background information about the industries in which a company operates, and the extent to which the company is involved in each. Analysed turnover could provide this information, subject to severe limitations. It will only rather imperfectly reflect the commitment of resources, manpower, managerial talent etc. It will not reflect profitability; it will be subject to manipulation. Under these circumstances it may be that the most information that can be sensibly conveyed about 'involvement' would be something of the form, 'we have substantial activities in industries X and Y, and minor activities in industry Z.'

It is possible, however, that analysts would dislike or distrust such messages; they, or their clients, may be functionally fixated on quantified data; auditors may not wish to audit a statement of the kind proposed; management may prefer to report what they perceive as 'objective' data. Provided that the analysts' decision models are known to an omniscient paternalist (in this instance, presumably, management or the organisation's accountants), it may be possible to design systems which report quantified data which is merely 'reconstituted' by analysts into qualitative impressions of the kind which lead to reasonable decisions.

Existing reporting models for FDDO may have some use of this kind.

Strictly speaking, a distinction should be made between models which feature a totally 'blind' user who merely applies the information given to him, and an 'intelligent' user who processes it further. In the former case, the paternalist must provide data in the knowledge of precisely how the user will employ it; in the latter case he may only need to know how it will be processed. If the processing consists purely of reconstituting the original data, as here, the paternalist will not need to know how the decision-maker will reach his decision.

7.4.2 Coded messages to sophisticated users

A segmental statement of net profit after tax would be likely to contain arbitrary allocations of a high degree of ambiguity. Could such allocations be sterilised? Suppose that sophisticated users can interpret an segmental report involving allocations, to obtain the vague clues contained therein. Naive users cannot absorb the information at all. The same result could be obtained so far as the sophisticated users are concerned by a narrative commentary incorporating the 'legitimate' information which is 'hidden' in the segmental report - but this would also be understood by naive users who would, however, react inappropriately. The same result might be achieved by producing reports which contained only the legitimate information, but restricting access to the reports to those users who had achieved some standard of sophistication. This method would clearly be unacceptable under present reporting requirements.

The allocations necessary to produce an appropriate code might be

obtained by allowing managerial discretion or by developing a suitable set of generally acceptable accounting principles. Provided that one could be sure that sophisticated users would interpret the report properly, and that naive users would not learn anything at all from the report, it could be argued that the allocations were 'sterilised' from the point of view of the sophisticated user - and, perhaps, from the point of view of the naive user also.

The objection may be raised that discrimination of the kind proposed above will have adverse economic consequences for the naive users who will be outwitted by their more sophisticated competitors. This is certainly true, but the objection will apply to any reporting scheme which depends for its rationale on particularistic usefulness.

7.4.3 Enhanced parameter estimation

Suppose that a user has correctly decided to use a particular parameter in a decision model. He does not have direct access to a value for the parameter, so he has to estimate it: it may, for example, need to be forecast. With sufficient knowledge of the user's estimation procedure (data processing model), it may be possible for an omniscient paternalist to 'guide' him to a better estimate than he would otherwise achieve, always assuming that the paternalist can obtain a superior estimate by some external means.

Consider the case shown in table 7.1 and figure 7.2. The parameter to be estimated is p for period 2 (p_2). The user's forecasting model, which can be applied to either segmental or aggregate data, is eminently prudent: if

Table 7.1

Omniscient paternalism and enhanced parameter estimation

User's naive forecasting model:

From an upward trend: $p_2 = p_1$

From a downward trend: $p_2 = p_1 - (p_0 - p_1) = 2p_1 - p_0$

Observer's sophisticated forecast:

300

Aggregate parameters:

$p_0 = 250$

$p_1 = 350$

User's naive forecast:

$p_2 = p_1 = 350$

Example of disaggregated information which would yield a superior forecast:

	t_0	t_1	t_2 (forecast)
Segment 1	200	150	100
Segment 2	50	200	200
Total	250	350	300

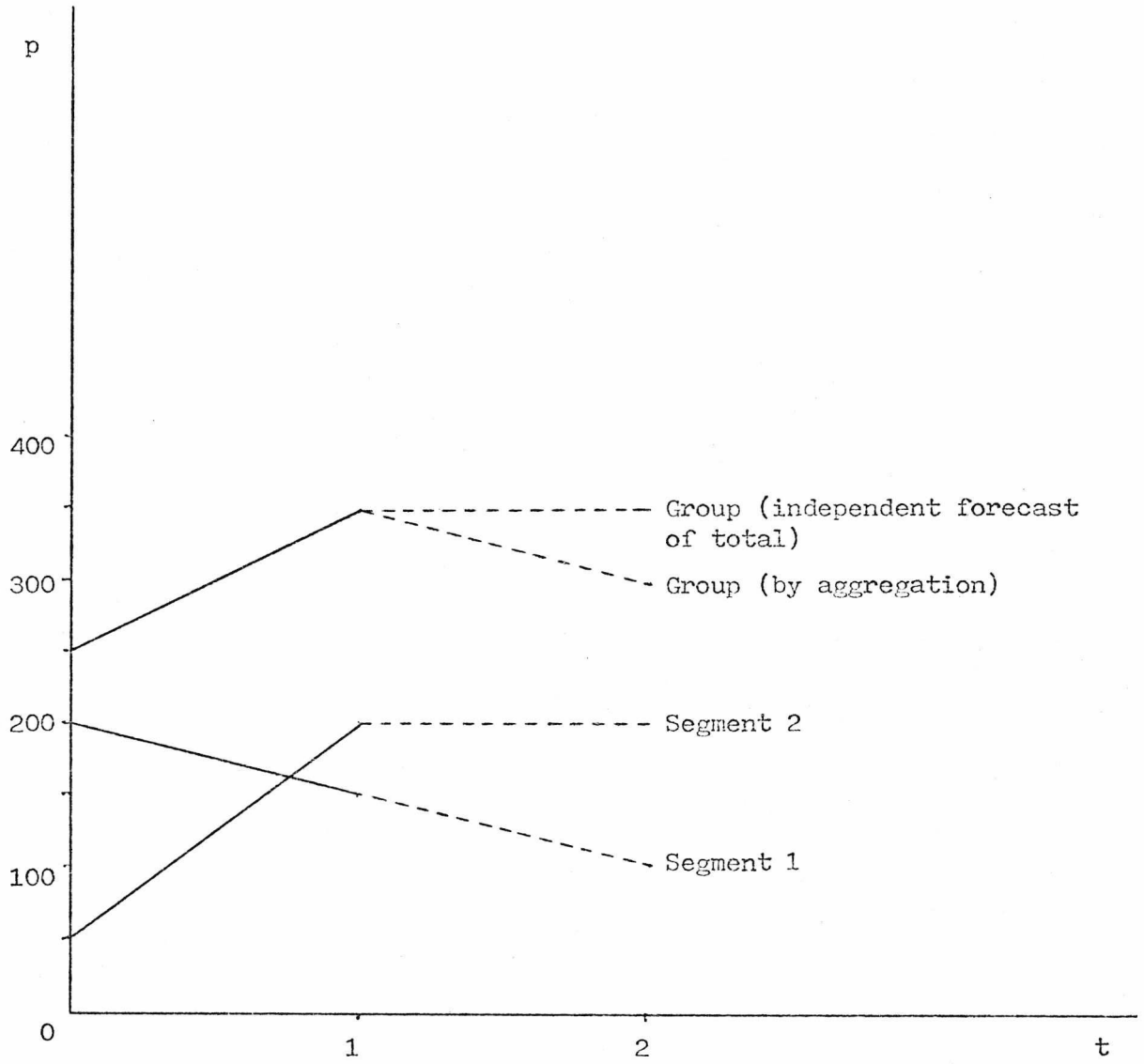


Figure 7.2: The user's forecasting model at group and segmental levels

the trend between the previous two periods is upwards, it is assumed that future values of the parameter will equal the latest value; if the trend is downwards, it is assumed that it will continue. This model applied to the aggregate data yields a forecast of 350 for p_2. The observer, however, has access to a more sophisticated model which yields a value for p_2 of 300. Can the user be induced to make this forecast by being provided with disaggregated data? The table and figure show one possible set of values for two 'segments' which will yield forecasts which aggregate to a value of 300 for p_2. The solution is not unique. The values of p for the segments have a rather peculiar status: they may well be meaningless in themselves, although they would presumably have to be passed off on the user as being meaningful.

7.5 LIMITATIONS OF THE APPROACH

It is easy to devise abstract situations in which segmental reports incorporating sterilised allocations would be useful, in the sense of achieving an end so engineered as to be satisfactory and without unwanted side effects. Is it likely that the general reporting of segmental statements could be systematically justified by the sorts of models discussed in the previous section? There are severe limitations to the approach.

The approach is complex and requires the specification of a hierarchy of models, some or all of which have behavioural dimensions. For example, the application discussed in section 7.4.1 demands that all users of the information to be provided, share a common awareness of the limitations of analysed turnover.

All the models discussed require the specification of a 'correct', or at any rate a 'superior' decision vector or information set arrived at by a route independent of the segmental information disclosed in the model. Hence, it is clear that other models must be used to arrive at the starting point for the process. The design of these models is a necessary step prior to the implementation of an omniscient paternalism approach: the defence of paternalism demands evidence of omniscience.

The use by managers of their special insight might be one possibility. This would, however, amount to letting managers provide apparently spurious information based on their own views. On the whole it seems unlikely that the accurate perceptions which the paternalist (in this case, the manager) would need to achieve the insights would be enhanced by permitting the measurement system at the reporting level to be manipulated.

A further problem is that, in any general reporting framework, sterilised allocations may fall into the wrong hands. As Thomas puts it,

> 'While in management accounting it is at least conceivable that a particular allocation will be employed by one user for one purpose, any allocation in financial accounting would ordinarily be employed by a variety of readers for a diversity of purposes. We cannot expect that only those for whom an allocation was sterilised will attach significance to it. Yet, there is no reason to expect that an allocation method that is sterilised for one reader and his or her purpose will be sterilised for any other purposes, except by coincidence.'[1]

The 'coded message' example provides a fairly straightforward instance. Naive users are having information suppressed from them because the paternalist believes that they would misuse it and penalise themselves.

---

1 Thomas, 1974, pp 45-46.

It seems unlikely in practice that one could rely on a set of users to disregard entirely the information contained in one part of the report; it is far more likely that they will attempt to make some use of the information and perhaps cause themselves more damage than if they had been given the 'superior' information set. The example also demonstrates another drawback of reporting schemes, the rationale of which is based on considerations of utility: reporting schemes have economic consequences, and if information is provided to one group and not another, it will yield an advantage to the former group against the latter.[1]

Any model which relies on misrepresentation to one or more parties (in this case, decision-makers) is subject to the danger that the perpetraters will be 'caught out'. The conditions which give rise to the need for misrepresentation make it unlikely that the decision-makers will realise that the deception was in their own interests. Hence the source of data is likely to be abandoned, with consequences which may far outweigh the suboptimality which would have been caused by actually reporting the best available 'real' data.

In short, omniscient paternalism requires that the paternalist has an intimate acquaintance with the models employed by the beneficiaries of his paternalism. These models themselves need to be systematic, stable and widely used if the approach is to succeed. Further, the paternalist must have access to an independent model, not available to the decision-maker, based on accurate, or at any rate, superior perceptions. It seems unlikely, therefore, that the approach could yield satisfactory results in an area such as FDDO, where the empirical domain is ill-perceived and users' data processing models are poorly specified.

---

1 See S A Zeff, 'The rise of "economic consequences"', Journal of Accountancy, December 1978, pp 56-63.

7.6 THE PREDICTIVE ABILITY CRITERION

An alternative approach to sterilisation is the predictive ability criterion.[1] The primary function of accounting numbers is taken to be their ability to predict future values of given parameters. It is accepted that the ability of a parameter to predict future values of itself (extrapolation) is of little use unless the parameter itself is of some use. Hence the starting point for the test is the nomination of some parameter which it is desired to predict - let this be called the object of prediction (q). The parameter used to make the prediction (p) and the mechanism used to make the prediction (m) can be selected in, broadly speaking, two ways:

1 Causally. The structure of the empirical domain is examined to detect causal relationships which can be observed, as it were, part-way through.

2 Statistically. Past experience is scrutinised in an attempt to detect regularities. The most general approach would accept any regularity into the fold. Thus a systematic approach would involve examining all parameters (and combinations of parameters) and all mechanisms available to process them. The number of values of q which could then be generated would be the product of the number of p's and m's. Each value of q could (in due course) be compared with the actual value (q*) and the combination of p and m which produced the nearest value of q would be declared the winner. Such a combination would, of course, need to be successful over a reasonably wide range of experience (for example, different entities, or time periods) to be acceptable for use.

---

1 See, for example, B Carsberg, J Arnold and A Hope, 'Predictive value: a criterion for choice of accounting method', in W T Baxter and S Davidson (eds), Studies in accounting (London: Institute of Chartered Accountants in England and Wales, 1977).

In practice, most advocates of the predictive ability criterion suggest a combination of the two approaches: the complexity of the social world makes it likely that several causal relationships can be posited and these need to be tested statistically; on the other hand a solely statistical approach would be unsatisfactory, since it would be extremely time consuming, and would provide little confidence that the relationship selected was in fact likely to be stable in future.

7.7 STATISTICAL MODELS AND SEGMENTAL REPORTING

7.7.1 Ortman

Ortman[1] performed a field test on a sample of financial analysts using simulated data. Each analyst was asked to indicate an offer price for a new issue of shares in each of two companies, both of which were operating in two industries. One industry had a high performance record (computers and office equipment) and one had a poor record (automotive parts). The control group were provided with aggregate data only, showing that company A was consistently outperforming company B. The experimental group received segmental data showing that company A achieved its results by doing very well in the weak industry but badly in the strong industry, whilst company B was doing reasonably well in the strong industry but badly in the weak industry. Further, the trend in each case was towards an increasing contribution from the successful segment. Put baldly, Company A had a bad record in the growth industry and was relying, to an

---

1 R F Ortman, 'The effects on investment analysis of alternative reporting procedure for diversified firms', Accounting Review, 1975, pp 298-304.

increasing extent, on a declining industry. Other 'pointers' such as research and development expenditure were also provided.

As with most samples of this kind, the response rate was poor (21% from the control group and 27% from the experimental group). With a very high degree of statistical significance, Ortman found that the provision of segmental data reversed the ranking of the analysts' valuations and produced a smaller variation in valuation.

7.7.2 Kinney

The Kinney study[1] is little more than an exercise in determining extrapolability. It covers 24 companies reporting segmental data voluntarily. The experimental input is a set of segmental sales and earnings data. Control data is provided in aggregate only. Simple prediction models are used (see table 7.2), and predictions of earnings are made for 1968 and 1969, based on previous results. The aggregate models were found to give poorer predictions to a statistically significant degree. The more sophisticated segmental model was superior to the segmental model using segmental revenue only, but the difference was not significant.

7.7.3 Collins

This study[2] uses data disclosed compulsorily (under the requirements of 10-K regulations for 'line-of-business' reporting which took effect in the

---

1 W R Kinney, 'Predicting earnings: entity versus sub-entity data', Journal of Accounting Research, 1971, pp 127-36.

2 D W Collins, 'Predicting earnings with sub-entity data: some further evidence', Journal of Accounting Research, 1976, pp 163-77.

Table 7.2

Prediction models used in the Kinney study

Experiment (segmental data)

The descriptive title of the segment was taken as an indication of the nature of the segment, and USA government statistical forecasts or trends from previous data were used to forecast trends for the segments.

Model 1

Segmental revenue was forecast from industrial forecasts and aggregated.
Consolidated earnings were predicted in proportion to revenue.

Model 2

Segmental revenues were forecast as in model 1. Three year averages of past segmental profitability were used to estimate segmental profits and these were aggregated.

Control (aggregate data)

Model 1

Earnings predicted to change in proportion to forecast GNP.

Model 2

Exponential smoothing of the linear trend in earnings.

USA from 1970) and a wider range of forecasting models than Kinney. The study used 96 firms reporting both segmental revenue and earnings from a randomly selected sample of 150 multisegmental firms. Forecasting models were chosen to be consistent with available empirical research, ie aggregate forecasting models were selected from those established by general studies to be good forecasters of income, and segmental forecasting models were based on those tested by Kinney, but were adapted to reflect the procedures which analysts claim to follow in analysing diversified firms.[1] Segmental sales were forecast on the basis of US government sector sales forecasts. Aggregate income was then established first by applying the consolidated profit margin (estimated statistically from previous years) to the forecast aggregate sales data, and secondly by applying segmental profit margins (similarly estimated) to segmental sales.

For sales, the segmental model was significantly more successful than all the consolidated models except one, namely the model based on estimated changes in GNP. For income, the two segmental models were not substantially different in the results they produced; both were a significant improvement on aggregate models. In general, these results applied for first differences as well as trends.

7.7.4 Kochanek

Kochanek[2] attempted to measure predictive ability (rather than extrapolability) by an indirect means. He used a sample of 37 diversified companies and classified them, by means of subjectively weighted criteria,

---

1 For example, in the evidence reported by M Backer and W B McFarland, External reporting for segments of a business (New York: National Association of Accountants, 1968), pp 9-10.

2 R F Kochanek, 'Segmental financial disclosure by diversified firms and security prices', Accounting Review, 1974, pp 245-58.

into good and poor reporters. He examined the correlation between changes in earnings per share and changes in share price (adjusted for new issues and changes in market prices generally) over a period before disclosure of the earnings measure. He found a significantly greater correlation between share price changes at least six months before disclosure and the disclosed change in earnings per share in the case of the good reporters, and a significantly greater correlation between later price changes and earnings per share in the case of poor reporters. He concluded from this that 'predictions of future earnings were facilitated by the availability of segment data.'[1] This conclusion would be true of any measure used as a basis for taking investment decisions, provided that the measure was also correlated with earnings per share.

Kochanek also investigated the variability of share prices and found some evidence that good reporters had lower fluctuations, but this result was not significant at the 95% confidence level. Characteristics of aggregate performance (for example, growth) appear to be more important.

7.7.5 Conclusions

The most striking characteristic of the empirical studies described above is the weakness of the data base used to make the predictions. Both Kinney and Collins differentiate between sales and profit data, but apart from this no analysis of different types of information is made, and none of the studies investigate the relative usefulness of different methods or bases of disclosure. Kinney and Collins conclude that disclosure of segmental profit does not add significantly to the predictive value of segmental sales information. This provides some - albeit very limited -

---

1 Kochanek, p 258.

statistical support for the view that there is no theoretically valid concept of segmental profit.

A further drawback of the poor quality of the data-inputs is that it makes any attempt to support statistical conclusions by causal models very difficult, and indeed none of the studies attempt to draw any systematic causal conclusions, beyond borrowing the received wisdom of Mautz[1] and others that,

> 'rates of growth and profitability and degree of risk differ among the segments of a company operating in substantially different industries. This makes the prediction of consolidated earnings [by an analyst lacking segmental data] unnecessarily difficult.'[2]

The studies by Kinney and Collins use a variety of forecasting models and it is apparent from their work that the number of models could be multiplied readily and with little effort. Their conclusions are not greatly affected by changes in the model used, although, for example, Collins found one aggregate sales model which was not significantly inferior to his segmental sales models. However there was a considerable range of predictive ability between different forecasting models; for example, in the Kinney study the difference between the average absolute error of the two segmental models was greater than the equivalent difference between the poorer of the two models and the better of the aggregative models. This suggests that the choice of forecasting method would be likely to have a significant effect on the selection of alternative bases by the predictive ability criterion.

---

1 R K Mautz, Financial reporting by diversified companies (New York: Financial Executives Research Foundation, 1968).

2 Kinney, p 127.

Three of the studies have used reported profit as the object of prediction and this makes them subject to the criticism that this may not be a parameter which users are (or should be) interested in. Further, any conclusions which might be drawn about different bases for reporting segmental profit are vulnerable to changes in the basis of reporting aggregate profit.

The Ortman study uses share value as the object of prediction, but since the data is simulated there is no opportunity to test whether the values calculated by the analysts were 'correct' as validated by the market. The data were contrived to point analysts in particular directions, and the analysts who were presented with segmental data certainly took the hint, but it has to be admitted that the data were exaggerated to achieve this. The more interesting result is perhaps that the analysts' valuations were less widely dispersed when they were provided with segmental data. Again, it is clear that the data were, to a certain extent, contrived so as to lead analysts to this result, and, of course, there is no reason to suppose that the value on which analysts converged was 'better'.

7.8 A CAUSAL MODEL AND SEGMENTAL REPORTING

Rappaport and Lerner[1] present a causal model for segmental reporting. In considering how to define the segments of a business, they state:

> 'For the postulated shareholder valuation model presented [in the study], a decision-relevant segmentation plan may be characterised as one which aids the shareholder in forecasting a company's future earnings growth and in estimating the risk involved.'[2]

---

1 A Rappaport and E M Lerner, Segment reporting for managers and investors (New York: National Association of Accountants, 1972).

2 Rappaport and Lerner, p 10.

Their static model proceeds from the tautology:

$$P = mE \qquad 7.1$$

where:

P = share price
E = reported earnings per share
m = a multiple (ie the price-earnings ratio).

They suggest that m is a function of the anticipated growth rate (g) although they concede that 'this relationship is an oversimplification'.[1] Further, they suggest that,

$$g = f(D,U,I) \qquad 7.2$$

where:

D = demand
U = capacity utilisation rate
I = new investment (ie increased capacity).

Changes in cost structure are ignored. Rappaport and Lerner argue that D, U and I must be specific to individual segments, and hence information on E must be provided for segments.

The model suffers from a number of disadvantages. Some of the variables which are required by the model are of dubious operational meaning, even at the aggregate level. For example, investment expenditure is required to be broken down between replacement and expansion, which is difficult to define operationally, but, more seriously, the statements are required to disclose practical capacity in sales dollars (C), together with capacity utilised (u) such that,

---

1 Rappaport and Lerner, p 3.

Sales = Cu. 7.3

It is difficult to see how the relationship could be successfully captured. Capacity measured at average prices of current output would not represent an attainable target unless all unit prices could be preserved while sales volume increased, yet if total capacity is measured at the prices which would prevail for sales of that volume, the proportion of capacity utilised cannot be expressed in money terms.

More serious is the nature of the variables posited in the segmental model. Rappaport and Lerner define a segment as 'any product or market area that generates material revenues and expenses for the firm.'[1] This begs the question of what constitutes a single 'product'. Rappaport and Lerner suggest some guidelines (for example, the availability of external data, and differing revenue and cost structures), but this leaves a wide range of managerial discretion.

The model pays limited attention to interdependencies. The function specified ignores the cost structure of the organisation - in effect assuming constant returns in each segment by making future earnings a function of present earnings and growth in sales. However, in the segmental statement which Rappaport and Lerner propose, costs must be reported on a segmental basis so as to arrive at segmental profit. Although they concede the existence of common expenses, they maintain that these can be analysed by segments:

> 'Based on an analysis of Tenneco accounts, these decisions do not seem particularly difficult.'[2]

---

1 Rappaport and Lerner, p 10.

2 Rappaport and Lerner, p 46.

Other variables (sales, investment) are treated as independent from segment to segment. This is the nub of the problem: by constructing an analytical model in an empirical vacuum, it is possible to include in the model parameters which have no equivalent in the empirical domain.

7.9 CONCLUSIONS

For both statistical and causal models, the lack of clearly defined and fully specified segmental parameters with real-world meaning is a very serious drawback. Such parameters can only be established by direct scrutiny of the empirical domain. Once some parameters have been established, it may be possible to build useful reporting models based on the predictive ability criterion. In the absence of veritable measures, predictive ability is an elusive guide to the determination of reporting requirements. Thus the discovery of veritable measures is necessary as a prior step to the search for usefulness.

Chapter 8

TOWARDS A VERIDICAL REPORTING SCHEME

8.1 INTRODUCTION

In chapter 2 it was argued that financial reports should be veritable. The orthodox model for FDDO has now been shown to be unlikely to yield veritable reports under normal circumstances because of the central part which the allocation process must play. There seems to be little prospect of rescuing the model by any of the devices examined in the previous two chapters. This chapter begins the search for measures which can be applied to diversified operations and which will produce veritable reports. In the terminology of section 2.3, this chapter examines the construction of veridical reporting schemes for FDDO.

The chapter deals first with three issues connected with the construction of veridical schemes, and then examines some aspects of diversified operations which might feature in such schemes. In both this and the following chapter, some threads have been drawn from general systems theory.[1] Both chapters contain observations based on weak notions of usefulness, but veridicality remains the overriding test.

8.2 MULTIPLE OPERATIONALISM

Multiple operationalism was developed by Webb et al,[2] who defined it as

---

1 See particularly F Baker (ed), Organisational systems: general systems approaches to complex organisations (Homewood, Illinois: Irwin, 1973).

2 E J Webb, D T Campbell, R D Schwartz and L Sechrest, Unobtrusive measures: nonreactive research in social sciences (Chicago: Rand McNally, 1966).

the use of,

> 'multiple measures which are hypothesised to share in the theoretically relevant components but have different patterns of irrelevant components.'[1]

In the presence of difficulties of observation and measurement, the message of multiple operationalism is that we should seek, not the 'best' measure, but a set of measures of our chosen object or objects of attention. The need for, and value of multiple operationalism in a systems approach to organisational evaluation were suggested by Baker and Schulberg:

> '... we have described the many foci of concern in an open systems analysis [of an organisation]. Implicit in this approach is the realisation that to understand the functioning of a total system, and to allow for the emergence of a complete gestalt, it is necessary to integrate observational perspectives and data collecting modalities. Such a study's research design, therefore, should incorporate ... multiple operationalism.'[2]

In urging the abandonment of the orthodox model, it is not suggested that segments of a diversified organisation will not enjoy different degrees of success, face different prospects of future success, and so on. Multiple operationalism reminds us of the folly of seeking out a single alternative to segmental profit as the sole measure of success.

Webb et al provide a taxonomy of sources of measurement invalidity.[3] They are primarily concerned with the measurement of social phenomena, and in particular with the use of questionnaires to establish personal characteristics (attitudes, beliefs etc). However, organisational behaviour

---

1 Webb et al, p 3.

2 F Baker and H C Schulberg, 'A systems model for evaluating the changing mental hospital', in F Baker (ed), Organisational systems: general systems approaches to complex organisations (Homewood, Illinois: Irwin, 1973), pp 483-84.

3 Webb et al, pp 12-34.

is determined by the members of the organisation, and so a good deal of what they say is also relevant to accounting measurement. One of the most important problems which they discuss is that awareness of being measured may influence the attitudes of respondents. This effect is endemic in accounting measurement. Webb et al were concerned that the effect would bias the results of sampling, but the pervasiveness of accounting measurement changes, to a certain extent, the nature of the problem. A universally enforced reporting requirement would affect all organisations, but the awareness of being measured may have two, interrelated, consequences. First, if the object of measurement is being used as a proxy for some other phenomenon, the relationship between the underlying phenomenon and the proxy may be upset. Thus, for example, in an unmeasured environment, members of the organisation may work only for as many hours as are required to perform a task. If hours worked are used as a proxy for effort expended (say for the purpose of wage calculation), this may upset the relationship between the two. Secondly, even where the object of measurement is of primary concern, the act of measurement may distort behaviour by focussing attention on that object. An attempt to assess output by measuring only quantity may, for example, encourage members of the organisation to concentrate on volume at the expense of quality.

The possibility that the act of measurement may itself be an agent of change in an organisation is now well recognised.[1] However, it has not yet been possible to establish the extent of the influence in any systematic way.

X

1 For an early contribution to the literature, see V F Ridgway, 'Dysfunctional consequences of performance measurement', Administrative Science Quarterly, 1956, pp 240-47.

Another problem discussed by Webb et al is the possibility of change occuring in the nature of the measurement instrument without the observer being fully aware of it. In accounting measurement, for example, the development of accounting standards may affect a number being reported through time (perhaps in ways which are not immediately obvious), even though though the rules for determining that number have not changed directly. Thus a standard on research and development may change the basis of calculation of net profit, although a reader of accounts who was interested only in net profit might disregard changes occuring 'higher up' the income statement. Under such circumstances the reader, believing that the measurement instrument has not changed, may treat a time series as containing comparable data when it does not.

In the presence of sources of error, multiple operationalism is appropriate because,

> 'By employing several maximally different methods for measuring a particular variable, ther researcher obtains increased assurance that he is triangulating on the variable of concern. Since each method differs in the type of "noise" that it adds, the overlap or common variance across different methods ... in combination, produces a more complete and accurate view of the organisation ...'[1]

A shift in emphasis towards reporting a battery of measures would require substantial changes in the structure of mechanisms for data-capture, processing and reporting. Considerations of this sort are considered at length in a report by a committee of the American Accounting Association.[2]

---

1 Baker (ed), p 484.

2 American Accounting Association, Report of the Committee on Non-Financial Measures of Effectiveness, Supplement to Accounting Review, 1971, pp 164-211.

8.3 VERIDICAL REPORTING SCHEMES AND GOALS

Traditionally organisations have been seen as existing for the purpose of enhancing the wealth of their owners, and accounting reports have been moulded to a large extent by this consideration. As Moonitz puts it,

> 'the central position of the income concept in accounting ... is a special aspect of the more general interest in maintaining or increasing wealth.'[1]

Clearly, reporting schemes which evolve from a search for veritability will not necessarily accord this primacy to goals. Does this mean that they will be no use at all for the evaluation of organisations in terms of the achievement of (real or assumed) goals?

There is some reason to suppose that this would be an over-pessimistic conclusion. Etzioni[2] has pointed out that a scheme devised independently of the organisation's goals may still be of use in evaluating the organisation. In Etzioni's approach,

> 'the starting point ... is not the goal itself but a working model of a social unit which is capable of achieving a goal.'[3]

Etzioni is concerned with the evaluation of resource allocation. He argues that what would count as an optimal distribution of resources can be determined independently of the act of measurement relating to the

---

1 M Moonitz, The basic postulates of accounting (Accounting Research Study Number 1) (New York: American Institute of Certified Public Accountants, 1961), p 15.

2 A Etzioni, 'Two approaches to organisational analysis: a critique and a suggestion', in Baker (ed).

3 Baker (ed), p 462, emphasis supplied.

organisation, and the evaluation then becomes an answer to the question,

> 'Under the given conditions, how close does the organisational allocation of resources approach an optimal distribution?'[1]

The introduction of goals for the purpose of evaluation can, then, occur at any stage subsequent to the process of measurement. In some ways this may be inefficient, but it does have advantages. Being a separate stage, it can be conducted by different actors to those who carried out the measurement; who, indeed, may even be remote in time and space from them. Further, a variety of different evaluations (incorporating different goals) may be carried out, based on the same measurements. The goals in question may be either goals imputed to the organisation (in order to establish the extent to which the organisation is achieving its own goals), or the goals of some individual or group (in order to establish how the operations of the organisation affect him or them).

The division of functions could be made to correspond to the distinction between the reporting function and the users of accounts in the financial accounting process. Under these circumstances, the accountant would be able to provide reports <u>without</u> making assumptions about either the goals of the entities on which he was reporting or the goals of the users of the reports. The users of the accounts would then be free to construct their own teleological models, either at the level of the entity itself, or at some other level. For example, a shareholder might wish to use a profit-maximisation goal model applied at the level of the firm, whilst an environmentalist might wish to use a pollution-minimisation goal at the level of the entire industry of which the firm is a member. This latter

---

1 Baker (ed), p 462.

evaluation procedure could successfully handle a situation in which the particular firm chose a production technology which did not minimise its own pollution but which provided scope for reductions in pollution at other points in the chain of production. The key point is that both users could employ the same report for their different purposes.

Separation of the measuring and the evaluative functions does not preclude the accountant,

1 Offering advice to the users of accounts about the types of evaluation model and techniques (eg inter-firm comparison) the users of reports should employ.

2 Providing one or more evaluations in the same report as the measurements.

8.4 INFORMATION OVERLOAD

The thrust of the previous two sections is towards the multiplication of items to be included in financial reports. Moves in this direction expose reports to the dangers of information overload:

> 'The service rendered by an accountant transmitter is not only that of giving the reader receiver a secondhand experience of financial affairs; it is also that of reducing the complicated reality to a summary which can be grasped by a non-specialist who is outside the situation. It would defeat this object ... [if the accountant were to] transmit all apects of the situation (even if this were possible)....'[1]

---

1 P A Bird, 'Standard accounting practice', in H Edey and B S Yamey (eds), Debits, credits, finance and profits (London: Sweet and Maxwell, 1974), p 5.

The problems associated with the selection of the optimal amount of information to be transmitted are part technical and part behavioural. A fairly substantial literature has developed on the technical aspects of information transmission,[1] but in the main the literature assumes the existence of an uncontroversial data-base about which questions of selection, aggregation, transmission, cost and, in general, optimal provision, have to be answered. The semantic link between the data-base and the real world is not explored. As Weaver puts it,

> 'The concept of information developed in this theory ... has nothing to do with meaning....'[2]

Lev[3] develops a bivariate measure of the loss of information caused by aggregation in conglomerate reports which assumes that it is possible to establish without difficulty a two-dimensional matrix of 'underlying' data for conglomerates, showing 'revenue and cost items in the rows and products or industries in the columns.'[4]

Thus, before the techniques of information theory can be applied to the problems of FDDO, an uncontroversial data-base must be established. Given the nature of financial reporting, it seems unlikely that widespread agreement on a data-base would be achieved if it did not satisfy the minimum condition of verity. It also seems unlikely, at least in the present state of the behavioural sciences, that the problems encountered in the behavioural dimension will be able to be resolved other than by

---

1 For a contribution directed specifically towards accounting applications, see B Lev, Accounting and information theory (Studies in Accounting Research Number 2) (Evanston, Illinois: American Accounting Association, 1969).

2 Quoted in Lev, p 2.

3 Lev, chapter 7.

4 Lev, p 66.

testing on a case-by-case basis. Although not essential, it is desirable, for the reasons discussed in chapter 2, that the information which is tested should be veritable.

The problem of information overload is a substantial one and it must not be ignored. The resolution of the problem will be easier when veritable reports are available for analysis and testing.

8.5 CASH FLOW ACCOUNTING

One of the key resources of any organisation, and one with which accountants have traditionally been concerned, is cash:

> 'In the final analysis, cash flows into and out of the business enterprise are the most fundamental events upon which accounting measurements are based and upon which investors and creditors base their decisions.'[1]

In this section the model of financial reporting known as cash flow accounting will be examined. The model is of particular interest since it has already been proposed by several writers as a general system of financial reporting, and since one of the principal virtues claimed for it is that it overcomes the general problem of allocation. The wider issues concerning cash flow accounting are not considered here: for general treatments of the model see Lee,[2] which draws together his earlier work on the subject, and Lawson.[3]

---

1 E S Hendriksen, Accounting theory (Homewood, Illinois: Irwin, 1970), p 237.

2 T A Lee, 'The cash flow accounting alternative for corporate financial reporting', in C Van Dam (ed), Trends in managerial and financial accounting, I (Leiden: Martinus Nijhoff, 1978).

3 G H Lawson, 'The rationale of cash flow accounting', in Van Dam (ed).

8.5.1 FDDO in general cash flow models

In 1972 Lee provided an example of a set of cash flow statements, 'in order to give interested readers an opportunity of seeing what these reports could look like in practice.'[1] He went on to say that 'it is hoped that their presentation may generate further suggestions for amendment and improvement.'[2] The example provided by Lee is shown in figure 8.1. It is interesting to note that even at this early stage in the development of cash flow reporting, segmental data is included. Describing the 'manufacturing and/or trading transactions flow', Lee says that 'this data would be analysed according to significant economic unit groupings.'[3] He goes on to say that,

> 'The main advantage of this supporting cash flow statement appears to be that it supplies the investor with information concerning the contribution to total cash flow of each of the company's economic units. It does so without revealing individual profit margins, a point which is often put forward as the reason for not disclosing detailed costs of production in conventional stewardship financial statements. The emphasis of the statement, therefore, is not on the relative profit contribution of each unit, but on the relative contribution each makes to the continuing survival of the company as a whole - a much more fundamental, and in many ways, more important issue to the investor.'[4]

The presentation which Lee proposes is shown in the statement of operational transactions flow in figure 8.1 For each segment, Lee's statement shows sales revenue, materials costs, labour costs and allocable

---

1 T A Lee, 'A case for cash flow reporting', Journal of Business Finance, 1972, p 31.

2 Lee, 1972, p 31.

3 Lee, 1972, p 31.

4 Lee, 1972, pp 33-34.

Statement of total cash flow—year to 31 July 1971

Cash Flows	*Year to 31 July* 1967 F	A	1968 F	A	1969 F	A	1970 F	A	1971 F	A	*Total* F	A	1972 F	1973 F	1974 F	*Total* F
1) Bank and Cash Balances	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Brought Forward	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
2) Operational	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Transactions Flow	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
3) Exceptional Transactions	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Flow	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
4) Financial Transactions	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Flow	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
5) Capital Transactions Flow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
6) Taxation Transactions Flow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
7) *Net Distributable Flow*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
8) Interest and Dividends	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
9) *Undistributed Bank and*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cash Balances	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

Note: In this and subsequent Tables column "*F*" contains forecast data, and column "*A*" contains actual data; + is a cash inflow and − is a cash outflow.

Statement of operational transactions flow—year to 31 July 1971

Cash Movements	*Year to 31 July* 1967 F	A	1968 F	A	1969 F	A	1970 F	A	1971 F	A	*Total* F	A	1972 F	1973 F	1974 F	*Total* F
Economic Unit A																
1) *Sales Revenues*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
2) Materials Costs	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
3) Labour Costs	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
4) Allocable Overhead Costs	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
5) *Net Cash Contribution*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1−(2+3+4)	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
Economic Unit B																
6) *Sales Revenues*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
7) Materials Costs	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
8) Labour Costs	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
9) Allocable Overhead Costs	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
10) *Net Cash Contribution*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
6−(7+8+9)	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
11) Non-allocable Overhead Costs	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
12) *Net Operational Cash Flow*	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5+10−11	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

Figure 8.1: Lee's specimen cash flow statements

Statement of financial transactions flow—year to 31 July 1971

Cash Movements	*Year to 31 July*									
	1967	*1968*	*1969*	*1970*	*1971*	*Total*	*1972*	*1973*	*1974*	*Total*
	F A	*F A*	*F A*	*F A*	*F A*	*F A*	*F*	*F*	*F*	*F*
1) *Loans Received*	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
2) Loan Repayments	− −	− −	− −	− −	− −	− −	−	−	−	−
3) *Share Issue Receipts*	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
4) *Total Net Contribution* 1−2+3	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
	− −	− −	− −	− −	− −	− −	−	−	−	−

Statement of capital transactions flow—year to 31 July 1971

Cash Movements	*Year to 31 July*									
	1967	*1968*	*1969*	*1970*	*1971*	*Total*	*1972*	*1973*	*1974*	*Total*
	F A	*F A*	*F A*	*F A*	*F A*	*F A*	*F*	*F*	*F*	*F*
1) Outright Purchase of Physical Resources:										
Land and Buildings	− −	− −	− −	− −	− −	− −	−	−	−	−
Plant and Vehicles	− −	− −	− −	− −	− −	− −	−	−	−	−
2) Instalment Purchasing of Physical Resources:										
Plant and Vehicles	− −	− −	− −	− −	− −	− −	−	−	−	−
3) Hire Rental of Plant	− −	− −	− −	− −	− −	− −	−	−	−	−
4) *Sale of Physical Resources:*										
Land and Buildings	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
Plant and Vehicles	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
5) Net Cost of Acquiring Physical Resources 1+2+3−4	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
	− −	− −	− −	− −	− −	− −	−	−	−	−
6) Purchase of Investments:										
In Subsidiary Companies	− −	− −	− −	− −	− −	− −	−	−	−	−
In Associated Companies	− −	− −	− −	− −	− −	− −	−	−	−	−
In Quoted Companies	− −	− −	− −	− −	− −	− −	−	−	−	−
7) *Sale of Investments:*										
In Quoted Companies	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
8) Net Cost of Acquiring Investments 6−7	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
	− −	− −	− −	− −	− −	− −	−	−	−	−
9) Research and Development Costs	− −	− −	− −	− −	− −	− −	−	−	−	−
10) Net Capital Transactions Flow 5+8+9	+ +	+ +	+ +	+ +	+ +	+ +	+	+	+	+
	− −	− −	− −	− −	− −	− −	−	−	−	−

Source: Lee, 1972, pp 33-35.

Figure 8.1(continued): Lee's specimen cash flow statements

overhead costs.

Proposed cash flow reporting schemes frequently incorporate measures which rely, like the traditional accruals model on the concept of benefit. Meyers,[1] for example, proposed a scheme which,

> 'gives explicit recognition to two major types of cash flows - operating and capital. The distinction ... itself requires an allocation of cash transactions between categories....'[2]

Lee segregates capital transactions from operating flows. By capital transactions he means,

> '...cash movements resulting from the purchase and sale of "profit-contributing" resources by the company, including land, buildings, plant, equipment, investments and sums expended in the area of research and development.'[3]

Thomas' analysis of the conventional accruals model, however, suggests that it is not merely in expensing 'capital' costs, but also in determining what counts as a capital cost, that arbitrary allocations arise.

The allocation problem arises in the FDDO context particularly in relation to outflows which benefit more than one segment. Lee segregates cash outflows on overheads into those which are 'allocable' to segments (actually using this term) and those which are 'non-allocable'. He does not indicate the criterion to be used in making the allocation but if it is to be related to benefit, the same problems will arise as are apparent

---

1 S L Meyers, 'A proposal for coping with the allocation problem', Journal of Accountancy, April 1976, pp 52-56.

2 Meyers, p 55.

3 Lee, 1972, p 31.

in the accruals model.

8.5.2 Cash flows as proxy measures

Advocates of cash flow reporting sometimes suggest that cash flows are of interest not merely for their own sake, but also as proxies for some more fundamental characteristic. In a quotation employed already in this section Lee describes segmental cash flows as measuring 'the relative contribution each [segment] makes to the continuing survival of the company as a whole.'[1] Unfortunately cash flow reporting provides an example of the effect discussed in section 2 of this chapter: the act of measurement may distort the relationship between the proxy and the underlying variable.

It has always been recognised that management may 'window-dress' balance sheets by influencing the timing of cash flows. The significance of this for the measurement of operating performance is believed to be mitigated by the nature of the accruals model. Under a cash flow model the significance of temporal manipulation is greatly increased, since, for example, delaying payments to creditors will directly affect the balance of operating flows which forms a key variable in most cash flow models. The importance of this for FDDO is that any attempt to compare the performance of one segment with another in the same group, or in the same industrial sector, may be upset by differential manipulations in the timing of cash flows.

---

1 Lee, 1972, p 34.

A more important source of distortion from the point of view of segmental disclosure is the scope which management has for shifting the incidence of cash flows around the group. Any expenditure which benefits two or more segments must be paid for by one or other of the segments (including head office as a separate segment) arbitrarily, just as the expenditure itself must be borne arbitrarily. Once the matching concept is abandoned, however, there is no direct discipline to prevent management from shifting all the group's revenues and expenditures around arbitrarily - instructing segment A to pay segment B's wage bill for example, or requesting customers to pay segment C for goods supplied by segment D. Under these circumstances net cash flows and net cash balances reported for each segment would be entirely a matter of management discretion.

Some factors which may serve to limit the scope for managerial discretion in shifting cash flows between segments are considered in the next two sections. The problem has been almost entirely ignored by advocates of cash flow reporting, presumably because of the difficulty of abandoning the principles of matching by time period and segment simultaneously.

8.5.3 The tangled web principle

The notion of 'manipulation' implies an autonomous pattern of flows which would follow as a natural consequence of the operations of the business if the flows were not manipulated. Although it may be easy to recognise certain events as manipulations, it is difficult to devise a satisfactory test of an autonomous flow. Autonomy of cash flows through time might be accepted in the face of (a) a 'normal' pattern of payments, (b) the prompt banking of receipts and (c) the absence of influence exercised on debtors to delay or bring forward payment. However, some variations in a

normal pattern of payments (if such a thing exists at all) are surely a part of good commercial practice, and it may be difficult to take proper account of this. As far as lateral manipulation (that is, manipulation between segments) is concerned, the obvious test which springs to mind is the benefit criterion, but to recommend this is to return to the problems associated with allocation.

The framework within which cash flow reports are constructed may provide some degree of discipline, especially if the cumulative effect of several years is taken into account. Some flows arising from trading may be difficult to divert between segments; it should, for example, be relatively easy to detect arrangements whereby sales made by one segment are invoiced by (or invoiced with instructions to pay) a different segment. This would not avoid the problems of commonalities of revenue, and it would certainly require an audit which went beyond the cash book, but it may well be that more reliance could be placed on this kind of segmental flow than on, say, trading cost flows.

Cash flow accounting cannot solve the problem of pricing inter-segmental transfers; indeed the problem may be aggravated if such transactions are not settled in cash, or are settled net. Some regulation could be established requiring that inter-segmental transfers of this sort should at least be treated as settled by cash payments, gross, with a corresponding loan if cash did not in fact change hands, and this would aid the proper interpretation of cash flow statements.

Some non-trading flows, though made at management's discretion, may be difficult to divorce from the associated benefit. For example, the raising of external capital is at management's discretion, both as to overall size and timing, etc, and as to the segment which receives the cash. It is not,

however, easy to disguise which segment has received the cash, and any 'onward movement' of the cash would also come to light in a cash flow report.

Investment in capital resources may also be difficult to divert between segments. Cash outflows on new and replacement projects are likely to occur in large lumps and could presumably be audited with some degree of precision, although again it must be conceded that marginal expenditures may be difficult to check, as when, for example, non-specific assets such as motor vehicles are acquired.

The requirement to report outturn against budgets or forecasts will also yield a degree of discipline. A company which observed one of its segments performing less well than was expected might be able to direct operating cash flows so as to report a satisfactory performance, but it would also have either to proceed with investment programmes which were not justified by the autonomous flows (with a consequent threat to its continued existence), or to explain why the programme had been reduced in the face of apparently satisfactory results.

The greater emphasis provided in segmental cash flow reports on inter-segmental financial transfers would also provide some discipline, since diversions in one part of the report will have to be matched by financial transfers disclosed - and explained - elsewhere in the report, or cumulative imbalances in the distribution of cash within the group will build up, which will themselves be a clue to readers of the report, and which, in any event, will have adverse consequences for motivation and financial management within the group.

Figure 8.2 shows an example of what might be called the 'tangled web' principle. The first set of columns shows a forecast for a group with two segments, A and B. The second set of columns shows the autonomous outturn: the group net cash flow for the period is as forecast, and hence, if all individual flows could be manipulated and allocated without hindrance, the pattern of outturns could be reported as identical to the forecast. Consider, however, what happens if external revenues cannot be manipulated between segments. By performing suitable manipulations to the internal revenue and cost flows, the net operating flow can be made to coincide with the forecast, and this arrangement is shown in the third set of columns. This would, however, require an explanation of the difference between forecast and outturn net cash flows in relation to receipts. Further difficulties arise for management if capital outflows cannot be manipulated. If management were to pursue an investment programme appropriate to the autonomous outturn (assuming this reflected long-term prospects), the programme would be at odds with the reported trading result; a programme which was appropriate to the reported results might hinder the group's prospects. A management which made this kind of sacrifice too frequently would find the total cash flows of the group suffering.

8.5.4 Other considerations

It was argued in the previous section that the discipline of publishing forecasts and the relative difficulty of manipulating some categories of flows may aid satisfactory interpretation of segmental cash flow reports. Indeed, it may be that publishing disaggregated data may make manipulation more difficult. In this section some other factors which may affect the

Segmental cash flow statement

	Forecast:			Autonomous outturn:			Manipulated outturn:		
	A	B	Total	A	B	Total	A	B	Total
Operating flows:									
Receipts - external	50	20	70	30	45	75	30	45	75
internal		5	5		5	5			
	50	25	75	30	50	80	30	45	75
Payments - for benefit of segment only	25	20	45	25	25	50	15	35	50
some benefit to group	5		5	5		5		5	5
internal	5		5	5		5			
	35	20	55	35	25	60	15	40	55
Net operating flow	15	5	20	(5)	25	20	15	5	20
External financing	10		10	10		10	?	?	?
Internal transfers				?	?	?	?	?	?
Irvestment in physical capital	(30)	(5)	(35)	?	?	?	?	?	?
Net flow for the year	(5)	-	(5)	?	?	?	?	?	?
Balances brought forward	10	5	15	10	5	15	10	5	15
Balances carried forward	5	5	10	?	?	?	?	?	?

Note: ? = at management's discretion.

Figure 8.2: The tangled web principle

scope for managerial discretion are examined.

Lee[1] believes that the normal discipline of the audit can be applied to cash flow reports:

> 'They should also be subject to audit, in much the same way as for traditional financial statements, not only to verify their adequacy but also to remove any suspicion that company management may be manipulating the figures by delaying or accelerating cash movements.[2]

He does not, however, explain how the auditor might detect such manipulations. He goes on to say that,

> 'it is also recommended, for the above reason and because of the need to disclose a sufficient trend of figures, that several years' data be reported.[3]

This might go some way towards overcoming the problem of temporal manipulation, but it could not overcome the problem of the permanent shifting of flows between segments.

Empirical research suggests that unsophisticated readers of financial reports conceptualise accounting flows in cash rather than accrual terms.[4] If this is so, it may be that such readers will more easily be able to conceptualise, and therefore cope with, cash flow manipulations rather than the arbitrariness of conventional allocations.

A further point is that the widespread manipulation of cash flows between segments by management would involve the sacrifice of a good deal of

---

1 T A Lee, 'Enterprise income: survival or decline and fall?' Accounting and Business Research, 1974, pp 178-92.

2 Lee, 1974, p 191, emphasis added.

3 Lee, 1974, p 191.

4 See for example, T A Lee and D P Tweedie, The private shareholder and the corporate report (London: Institute of Chartered Accountants in England and Wales, 1977).

internal management control. It is to be hoped that managements would not be prepared to make this sacrifice merely in order to achieve the dubious benefit of cosmetic adjustments to the financial accounts.

8.6 OTHER RESOURCES

8.6.1 Introduction

The traditional accounting framework includes, of course, other resources besides cash, although they are invariably measured in financial terms. From time to time the use of various ad hoc non-financial measures of organisational activity is proposed, though there has been very little systematic study of such measures. Interestingly, the American Accounting Association's Committee on Non-financial Measures of Effectiveness emphasised the value of such measures because,

> 'except where goals can be clearly specified, the best we can hope to achieve is to provide information which might potentially aid users in evaluating effectiveness.'[1]

This comes close to the argument of Etzioni discussed earlier.[2]

Non-financial measures may be of interest either directly or as surrogates. As an example of the former case, a measure of the degree of unionisation within an enterprise may be of direct interest to a union organiser in assessing the scope for a membership drive. By contrast, an investor

---

1 American Accounting Association, p 167.

2 Section 8.3.

interested in forecasts of future income of an enterprise may use degree of unionisation as a proxy measure of the liklihood of wage increases, industrial disputes etc.

8.6.2 Non-financial measures and allocations

It is perhaps tempting to think that the use of non-financial measures will avoid the problem of allocation, but this is not necessarily so. Consider the measure of unionisation discussed in the previous section. A segmental report of the degree of unionisation would require that all employees of the enterprise be attributed to one and only one segment, and persons employed by more than one segment would have to be allocated between segments in the same way that headquarters expenses have to be allocated.

The allocation problem may frequently be less serious, however, in the case of non-financial measures, for two reasons. First, the proportion of the total which is subject to allocation (and hence, the range of ambiguity associated with the allocation) is likely to be smaller. Secondly, measures which exclude the commonalities are likely to be more meaningful when non-financial measures are involved. For example, consider the data shown in figure 8.3. It is argued elsewhere that to regard segment A as earning a return on capital employed of 25% is conceptually unsound, because it may be that this return could not be earned without further cost if it were not for the existence of commonalities. By contrast, to regard the segment as 80% unionised because 16 of the 20 workers employed exclusively within the segment belong to a union has a more obvious meaning which is more easily interpreted.

Return on capital employed and percentage unionisation

	Segment A	Segment B	Commonality	Total
Revenues	100	50		150
Costs	50	30	20	100
Profit	50	20	(20)	50
Capital employed	200	100	50	350
Return on capital employed	25%	20%	(40)%	14%
Employees	20	10	4	34
Union members	16	3	0	19
Percentage unionisation	80%	30%	0	56%

Figure 8.3: Interaction amongst financial and non-financial measures

8.6.3 Some non-financial measures suitable for FDDO

Physical productivity

One of the most obvious measures available at the segmental level is physical productivity. Such a measure is described by Solomons.[1] The measure is simplest to use where the inputs and outputs of a segment are homogeneous - conditions which are, of course, unlikely to apply in practice. Nonetheless, there will be segments in which it is possible to reduce at least the major proportion of output to a measure of units which is not expressed in financial terms. Such a measure can then be used to determine what Solomons calls the 'partial' productivity of any particular relatively homogeneous group of inputs, also measured in non-financial terms. Thus, a segment manufacturing cement may be able to measure labour productivity in tons per man-hour. There will be problems in interpreting the measure, however, if there is any heterogeneity in the factors, as, for example, if a less-profitable type of cement is manufactured in variable proportions, or if different grades of labour can be employed, at different costs.

Further problems arise because of the partiality of the measure. Capital, or dearer inputs may be substituted for labour, for example, and this will increase labour productivity without necessarily increasing overall effectiveness or profitability. Solomons describes a measure of total productivity[2] which overcomes some of these problems, though at the expense of introducing the financial dimension. Speaking of productivity

---

1 D Solomons, Divisional performance: measurement and control (Homewood, Illinois: Irwin, 1965).

2 Solomons, pp 280-81.

measures generally, he says that,

> 'there are all too many variants ... and their multiplicity is evidence of the considerable element of arbitrariness to which productivity measurement is subject.'[1]

Such of the problems as arise from heterogeneity will, at least, be less serious when the measures are constructed at the segmental level, and thus productivity measures for segments should be more meaningful than those for entire groups. Although partial measures will, each taken individually, almost certainly be misleading, a battery of partial measures may overcome this problem to an extent.

Marketing effectiveness

As with physical productivity, the measures which are available (for example market share and market penetration) are difficult to interpret because of their inherent vagueness and arbitrariness. As Solomons says,

> '"The size of the market" is not a simple concept, for the same reason that "product" and "industry" are not simple concepts. For example, for a division which makes electric cooking ranges, does "the market" include (a) all cooking equipment or (b) all indoor ranges (gas and electric) or only (c) all electric ranges?'[2]

However, again as with physical productivity, it is likely that such measures will be more meaningful at the segmental level than at the level of the entire group.

---

1 Solomons, p 281.

2 Solomons, p 284.

Managerial talent

The American Accounting Association Committee suggeted that 'attempts may be made to measure the effectiveness of individuals.'[1] Certainly, managers represent a valuable resource for the organisation, and one which is, at any rate to a certain extent, transferable between segments. Even if it is not possible to provide satisfactory measures of an individual's effectiveness, it is possible to indicate which individuals occupy key roles in the organisation. At the moment, some information is provided in annual accounts about directors of the group holding company; others holding key positions in the group, and those occupying such positions in segments are named only if they happen to be directors of legal subsidiaries, and then only in the subsidiaries' accounts. Even for those individuals who are named, no idication is given of their influence and control. There is no doubt that such information could be vital:

> 'One senior City cocoa-trader says that "if I were a shareholder in Berisford and something were to happen to Margulies tomorrow, believe me, I would sell my stocks."'[2]

E S Margulies is in fact on the main board of S & W Berisford Limited, but the comment reported above relates to his activities on behalf of one of that company's segments. If he were not on the main board, he would not even be named in the group accounts, except at the discretion of the main board.

As well as naming important managers, perhaps further details about them could be provided. The potential shareholder in the quotation above, for example, might well be interested in a regular medical report.

---

1 American Accounting Association, p 179.

2 C Barron, 'How Berisford traded up', Management Today, November 1976, p 152.

As pointed out earlier, managerial talent is transferable between segments, and this leads to a need for information in the group's reports about,

1 The extent to which such transfers have been made, as an aid to the interpretation of the segments' results.

2 The systems which exist to ensure optimal distribution of talent.[1]

Other measures

Solomons suggests that the 'key result areas' used by the General Electric Company are useful for internal appraisal of divisions, and it may well be useful for external parties to have access to this information as well. The eight areas are profitability, productivity, market position, product leadership, personnel development, employee attitudes, public responsibility and balance between short-run and long-run goals. The American Accounting Association Committee also offer a variety of suggestions with respect to enterprises, some of which may be useful at segmental level.

8.7 CONCLUSIONS

This chapter has examined some aspects of the operations of a diversified organisation which might form the subject of a veridical reporting scheme. Each particular aspect can be measured, but the measures are difficult to interpret in relation to goals, and further, may be succeptible to the

---

1 This is one of the 'internal boundary control' functions of group management discussed in chapter 9.

distorting effects discussed earlier in this chapter. The latter problem can be overcome - in part at least - by the use of multiple-operationalism; the construction of useful reporting schemes will depend - again, in part at least - upon obtaining empirical evidence from the experimental application of a variety of measures.

Chapter 9

THE BOUNDARY CONDITION MANAGEMENT MODEL: (I) EXTERNAL BOUNDARIES

9.1 THE BOUNDARY CONDITION MANAGEMENT MODEL

The notion of boundary condition management within the systems framework was developed by Rice.[1] He constructed his model in 'an attempt to apply to individual and group behaviour a system theory of organisation',[2] but the model also has considerable relevance to the analysis of the enterprise itself. He begins with an orthodox systems theory of organisations, in which he focuses attention on the multiplicity of import-conversion-output processes which operate simultaneously. A task system comprises,

> 'that complex of activities which is required to complete the process of transforming an intake into an output ... plus the human and physical resources required to perform the activities.'[3]

Within each system, 'each component activity of the system is inter-dependent with at least some of the other activities of the same system',[4] whilst 'the system as a whole is identifiable as being in certain, if limited, respects independent of related systems.'[5]

Thus, although he proposes it in a different context, Rice's model would

---

1 A K Rice, 'Individual, group and intergroup processes', in F Baker (ed), Organisational systems: general systems approaches to complex organisations (Homewood, Illinois: Irwin, 1973).

2 Baker (ed), p 341.

3 Baker (ed), p 343.

4 Baker (ed), p 343.

5 Baker (ed), p 343.

appear to share the characteristics of a diversified organisation as viewed by a financial accounting theorist. From his emphasis on multiple task systems, Rice concludes that,

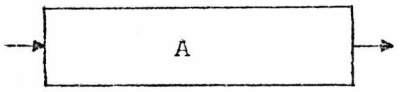
> 'the most important management control in any organisation is, therefore, the control of the boundaries of systems of activity, since it is only at boundaries that the difference between intake and output can be measured. Task management then is essentially:
>
> (a) the definition of boundaries between systems.
> (b) the control of transactions across boundaries.
>
> The boundary of a system of activities, therefore, implies both a discontinuity of activity and the interpolation of a region of control.'[1]

In essence, the model described by Rice can be applied at any level of the heirarchy of sub-systems that any complex system represents. Rice uses it to handle inter-personal and inter-group relationships at the activity level, but, as has been shown, it follows from the model's emphasis on multiple inter-related but differentiated task systems, that it can be applied equally well in the case of FDDO.

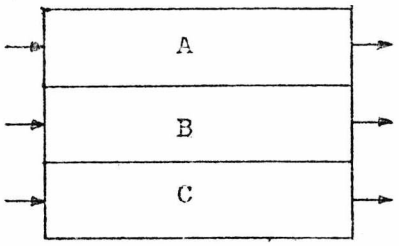
The shift in the approach to diversification implicit in the Rice model is represented diagrammatically in figure 9.1. Figure 9.1(i) shows a unitary organisation. Figure 9.1(ii) represents the view of a diversified organisation implicit in orthodox FDDO models: several (in this case, three) unitary operations are 'stacked' but do not interact. Figure 9.1(iii) represents the same three operations combined in the Rice model: each segment has conversion processes which import from and export to other segments of the organisation, as well as to and from the environment.

---

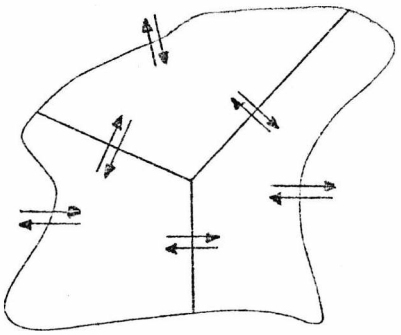
1 Baker (ed), p 343, emphasis supplied.



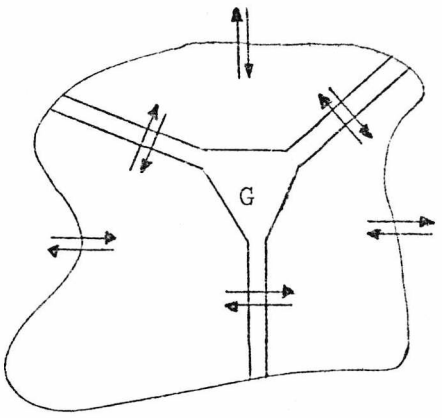
(i)



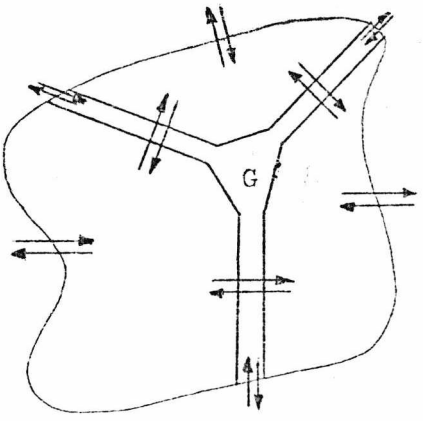
(ii)



(iii)



(iv)



(v)

Figure 9.1: The evolution of the boundary condition management emphasis

In the context of a diversified organisation, the control function discussed by Rice resides with the headquarters or group management. Figure 9.1(iv) shows the same organisation as figure 9.1(iii), but with the control function of group management (G) superimposed. It must also be recognised that the existence of group management within a diversified organisation represents another set of resources and systems which interact with the other segments and the environment. This dimension of group management is shown in figure 9.1(v): the relationships portrayed in this diagram are appreciably more complex than those shown in figure 9.1(ii).

Under the boundary condition management model the functioning of group management emerges as a separate activity with objectives, systems and resources of its own. These are of direct interest to those who are concerned with evaluating diversified organisations; they are largely ignored by conventional reporting models. The main function of group management is to control the conditions at the boundaries of the organisation, both internal and external. Information relating to the nature and success of this function may be useful, not only in evaluating overall organisational performance, but also in evaluating the performance of central management, and in predicting future performance.

9.2 CHANGING THE EXTERNAL BOUNDARY: COMMITMENT AND OPERATIONS

The processes by which organisations first become conglomerates, and then extend their range of diversification, are complex and involve the taking of decisions at several levels. Figure 9.2 presents an attempt to map these levels. Decisions at levels 1 and 2 represent commitments, rather

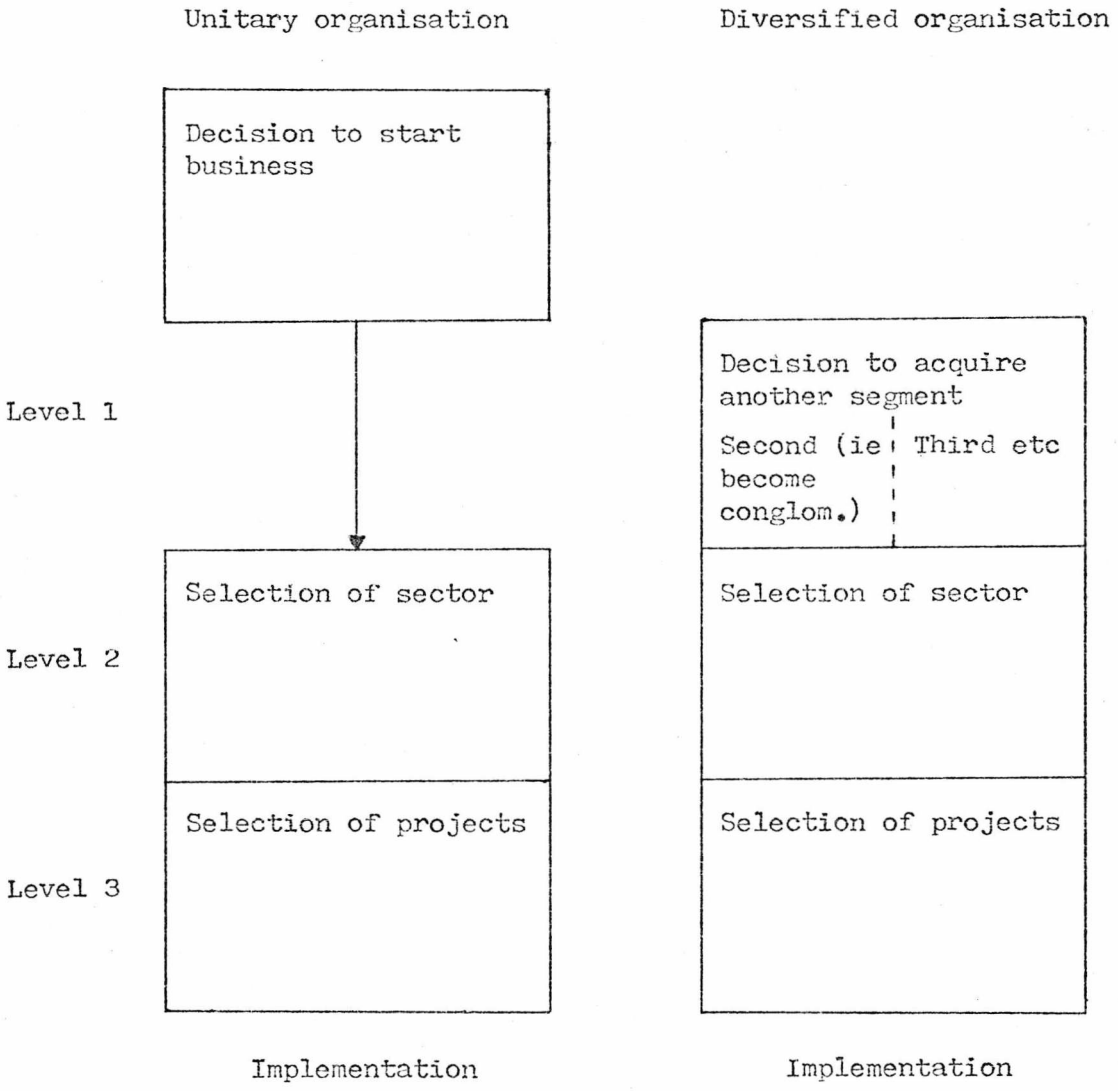


Figure 9.2: Levels of decision-making in the process of conglomeration

than variations in the actual operations of the organisation concerned. Level 1 includes decisions to secure diversification generally, without any commitment to a particular sector of industry; the decision to become a conglomerate (ie to acquire a second segment) is a special case of the level 1 decision. There is no equivalent to level 1 decisions in the unitary organisation. Level 2 decisions concern the selection of the sector in which the segment is to be established (this decision is taken only once in a unitary organisation), and level 3 decisions are about operations: they involve the selection of particular propects. Operations within a sector may be obtained by acquiring established projects (mergers and takeovers) or by setting up new ones (organic growth). Acquisitions of the former kind have received the lion's share of attention:

> 'Acquisition plays such an important part in the diversification activities of firms that many writers purporting to discuss diversification in fact discuss only acquisition.'[1]

The typology, and much of what follows, is set out in terms of expansion; most of what is said is also relevant to decisions about contraction and disinvestment.

The decisions involved in the process of diversification will not necessarily be taken in the sequence in which they have been discussed. For example, operations in a new sector may be acquired because they are discovered as part of the routine search procedures of an established segment and found to be highly profitable, rather than as a deliberate attempt to achieve diversification; in this case the selection of operations has taken place prior to the decision to diversify. Occasionally

---

1 E T Penrose, The theory of the growth of the firm (Oxford: Blackwell, 1972), p 127.

operations in a new segment may actually be acquired without a prior policy decision, for example as part of an inadequately researched take-over, but it is to be hoped that such events are rare. Normally decisions will be taken in descending order.

Decisions at levels 1 and 2 may be formally recorded in board minutes or other formal documentation, but there need be no record outside the minds of the directors. Generally, the decisions will not manifest themselves in actions involving significant quantities of resources. Rather, they will lead to level 3 decisions. The character of the progression means that:

1 It is much more difficult to detect decisions at levels 1 and 2, particularly in the absence of formal disclosure requirements.

2 The costs of reversing decisions at levels 1 and 2 before the consequent level 3 decisions have been implemented are much lower than the costs of reversing level 3 decisions.

The distinction between levels 1 and 2 decisions is important because the criteria to be employed, and the skills and judgement necessary to the application of the criteria may differ significantly: level 1 decisions concern the benefits to be enjoyed from the process of conglomeration, whereas level 2 decisions are in some ways analogous to the capital budgeting involved in level 3 decisions.

9.3 CURRENT CONTROL AND DISCLOSURE REQUIREMENTS IN THE UK

9.3.1 Ex ante disclosure and control

The memorandum of association of a company registered under the Companies Act 1948 is required to contain a clause setting out the objects of the company, and,

> 'a company may not legally carry out any activity which is not expressly or impliedly authorised by statute or by the list of objects and powers in its own memorandum of association. Any such activity is ultra vires, literally beyond its powers, in that the legal capacity of the company is held to be exhaustively defined by the Companies Acts and its own constitution.'[1]

The justification for this doctrine is that it was felt that 'the shareholders were entitled to have their capital used only for the purposes for which it was subscribed'.[2]

A special resolution is required to change the objects clause, and the adoption of completely new objects is limited to those which enable the company 'to carry on some business which under existing circumstances may conveniently or advantageously be combined with the business of the company.'[3]

A shareholder in a company which is acting outside its powers can apply for an injunction to restrain it. In principle, then, shareholders have

---

1 T Hadden, Company law and capitalism (Second edition; London: Weidenfeld and Nicolson, 1977), p 112.

2 Hadden, p 113.

3 Companies Act 1948, section 5.

some degree of control over decisions at levels 1 and 2 (by limiting the scope for diversification in the memorandum) and at level 3 (by the use of injunctions).

However,

> 'the theoretical purpose of the doctrine has ... been subverted by the desire of company directors and their legal advisers to avoid its effects. It soon became standard practice for company objects to be drawn as widely as possible to cover any type of business which those in control of the company might wish to turn to....'[1]

In the absence of control through the memorandum of association, the position of the shareholder in a diversified or would-be diversified company is weak. The general powers of the shareholders (for example, dismissal of the board) are available, of course, but these are notoriously unsatisfactory:

> 'It is part of the basic structure of ... company law that directors and managers shall have exclusive control over the management of a company's affairs, both on a day-to-day basis and in terms of general policy.'[2]

There is a tangled - but not particularly effective - web of requirements surrounding acquisitions of operations by means of purchasing established companies.[3] In general these requirements (which include the Licensed

---

1 Hadden, p 114.

2 Hadden, p 78.

3 For descriptions of these requirements, see P Davies, The regulation of takeovers and mergers (London: Sweet and Maxwell, 1976); and G Morse, Company finance, takeovers and mergers (London: Sweet and Maxwell, 1979).

Dealers (Conduct of Business) Rules 1960, made under the Prevention of Fraud (Investments) Act 1958, the Rules and Regulations of the Stock Exchange and the City Code on Takeovers and Mergers) cover all acquisitions, whether conglomerate or otherwise, and they are not designed for the benefit of the shareholders of the offeror:

> 'The Code, like the Licensed Dealer Rules, is primarily concerned with the protection of the shareholders of the target company....'[1]

Where the acquisition (whether of shares or assets) is funded directly or indirectly by the issue of shares, shareholders in the offeror may have some measure of control if the issue of the shares necessitates an increase in the authorised capital of the company, since the shareholders' approval is needed for this. Normally the right to issue shares is vested in the directors by the articles of association, and therefore the shareholders will have no power where authorised capital is already sufficiently large.

Listed companies are bound by the Rules and Regulations of the Stock Exchange, and, in particular, by the 'listing agreement' which has recently been revised.[2] The revisions appear to weaken the degree of control which shareholders are given over diversification by their companies.

---

1 Davies, p 38.

2 The rules governing the admission of securities to listing ('the listing agreement) are contained in Appendix 34 to the Rules and Regulations of the Stock Exchange. The latest revision is given in: Stock Exchange, Admission of securities to listing (Revised edition; London: The Council of the Stock Exchange, 1979, updated from time to time). The previous revision was contained in: Stock Exchange, Admission of securities to listing (Revised edition; London: The Council of the Stock Exchange, 1973, updated from time to time).

The 1973 edition of the agreement contained a requirement that, when a proposal was made to increase the authorised share capital of a company, and,

> 'where 10% or more of the voting capital will remain unissued (disregarding shares reserved for issue against exercise of subsisting conversion rights or options) the directors must undertake that no issue will be made which would effectively change the control of the company or nature of its business without the prior approval of the company in general meeting.'[1]

In the 1979 edition, the words 'or nature of its business' are removed, thereby eliminating the control of shareholders over this device for obtaining diversified operations.

Again, the 1973 edition of the agreement required that,

> 'any transaction which might reasonably be expected to result in either the diversion of 25% or more of the net assets of the company to an operation which differs widely from those operations previously carried on by the company, or the contribution from such an operation of 25% or more to the pre-tax trading result of the company should be made conditional on approval by the company in general meeting.'[2]

The equivalent requirement in the new agreement relates to all transactions the size of which exceeds 25% of the existing group's operations (by a variety of measures), whether they represent a change in activity or not, but changes by diversion of existing resources will not be caught under the new requirements.

The government have, besides their general powers to control industry and trade, some control over conglomerate acquisitions by takeover and merger.

---

1 Stock Exchange, 1973, p 9, emphasis added.

2 Stock Exchange, 1973, p 64.

The appropriate Secretary of State is empowered by the Fair Trading Act 1973 (replacing the Monopolies and Mergers Act 1965) to refer certain mergers to the Monopolies and Mergers Commission on the grounds that they may operate against the public interest. If the Commission concludes that a merger may indeed be expected to operate against the public interest, the Secretary of State has wide powers to control the situation, including obtaining undertakings from the parties involved as to their future conduct, forbidding the merger, reversing a merger that has already taken place, and imposing restrictions on the merger. Mergers which can be referred include those where the total gross book value of assets taken over exceeds five million pounds.[1] Thus conglomerate acquisitions of this size can be caught.

Amongst the issues which the Commission has considered in connection with conglomerate mergers are:

1 Anti-competitive consequences following from cross-subsidisation to drive out competitors in a particular segment.

2 The availability of management skills appropriate to operating a diversified, or further diversified, group. This is a case in which the interest of the public and that of the shareholders are likely to coincide, although the Commission's judgement may differ from the shareholders'.

3 Absorption by conglomerate 'giants' of vigorous small and medium-sized companies which could offer greater efficiency.

4 General social and political objections to large companies, even when they do not dominate individual industrial sectors.[2]

---

1 Fair Trading Act 1973, section 64.

2 Office of Fair Trading, Mergers: a guide to the procedures under the Fair Trading Act 1973 (London: HMSO, 1978).

In summary,

> 'the basis of Government intention to control vertical and conglomerate mergers is less clear-cut than in the case of horizontal mergers ... but ... from the introduction of the legislation to control mergers in 1965, the Government has taken and maintained the power to control conglomerate and vertical, as well as horizontal mergers, although emphasising at different times different reasons for so doing.'[1]

However, the bias of the legislation (which requires that a merger be shown to be against the public interest before it is upset), and its operation is clearly towards permitting mergers: between 1965 and 1973 910 mergers were considered by the Government to fall within the terms of the extant legislation; only 24 were in fact referred to the Commission (excluding transactions involving newspapers, which are required by the legislation to be referred).

9.3.2 Ex post disclosure

The Stock Exchange listing agreement requires that listed companies disclose particulars of certain kinds of acquisitions or realisations of assets. In the main, disclosure varies according to the materiality of the transactions. Class 1 transactions are those which involve assets which have a value, or yield earnings, in excess of 15% of the company's aggregate value or earnings, or where the consideration involved exceeds 15% of the company's total assets, or where equity issued for the assets exceeds 15% of the company's total equity. For transactions in this class

---

1 Davies, pp 5-6.

shareholders must be notified, as must the Quotations Department of the Stock Exchange and the press. Class 2 transactions are those for which the above measures exceed 5%. Disclosure is by notification to the Quotations Department and the press. Class 3 transactions comprise the remainder, and do not normally require disclosure.

These requirements relate, of course, to all transactions whether conglomerate or otherwise. In addition the Companies Act 1967 requires that the directors' report should include a description of the principal activities of the company and its subsidiaries in the course of the year and any significant changes in those activities during the year. Further information may be gleaned from other sections of the report, including the particulars of any significant changes in fixed assets during the year, the reasons for any issue of shares or debentures that has taken place during the year, and, of course, the analysis of turnover and profits by class of business, if this is provided.

9.3.3 Gratuitous disclosure

Gratuitous disclosure can take many forms, but it rarely discusses the motive for the acquisition. Where motives are discussed, the report usually relies heavily on appeals to physical and biological analogies such as the need for broad bases and healthy growth. The following paragraph is typical. It comes from the Chairman's statement in the annual accounts of The Bowater Corporation for 1972. During the year the company spent some £91 million (equivalent to over one third of its previous historical cost capital employed) on the acquisition of two groups of companies which entailed a transition from a unitary undertaking, earning approximately

90% of its profits from paper and packaging, to a conglomerate with interests in, inter alia, furniture and carpets, commodity trading, merchant banking, European inland transportation and warehousing, property development, livestock, the manufacturing and retailing of clothing, jewellery, glass, caravans and air conditioning equipment, and a variety of financial activities. The nearest Lord Errol of Hale comes to describing the motive for these acquisitions is when he writes,

> 'The year 1972 was an outstanding one in the history of The Bowater Corporation Limited. The merger with Ralli International Limited and the acquisition of Beautility Limited have achieved the diversification of your company from a group primarily dependent on paper and allied products to a much more broadly based international manufacturing and trading organisation.'[1]

9.3.4 Summary

1 Disclosure of level 3 decisions is haphazard: often it is not distinguished from disclosure of the growth of existing operations; the extent of disclosure depends on the method by which the acquisition is funded, whether the acquisition is by purchase or growth, and whether the acquisition is achieved by one transaction or several; control and disclosure is ill-regulated and deteriorating.

2 Disclosure of decisions at levels 1 and 2 is almost non-existent, except to the extent that a change in the memorandum of association is both required and sought - which is rare.

---

1 The Bowater Corporation Limited, Annual report and accounts 1972, p 5.

3 The main thrust of disclosure requirements in respect of transactions in established companies is towards the protection of the owners of the target company rather than of the predator.

9.4 THE RATIONALE FOR CONGLOMERATE DIVERSIFICATION

The previous sections of this chapter suggest that the process of changing the external boundaries of the organisation is first, complex; secondly, largely outside the control of shareholders (and other parties having an interest in the organisation, with the exception of management); and finally, subject to only weak and inadequate disclosure requirements. Do shareholders need to control the process, and if so, what information do they require? As a preliminary step to answering this question, it is necessary to consider the rationale for conglomerate diversification.

Given the hazy nature of the concept of the organisational goal generally, and the absence of systematic disclosure of even formal public goals as a remote proxy for latent informal and private goals, it is unsuprising that there is no generally agreed rationale for conglomeration. The recieved wisdom of industrial economics offers two major attractions of conglomerate growth:

1 Reduction in the variability associated with the returns from the enterprise (risk reduction).

2 The superior efficiency of internalising the mechanisms of the capital market.

In addition, some authors point to various managerial economies of scale which may be obtained to a greater extent (or perhaps only) by conglomerate as opposed to unitary growth. It is also argued that a variety of synergies or complementarities may be available if the

conglomeration is 'impure'. These are, of course, akin to the interaction effects which are examined elsewhere. Each of these rationales will be discussed in turn.

9.4.1 Risk reduction

In an uncertain world, it is argued, conglomerate growth enables enterprises to reduce the variability associated with their returns. George[1] offers a naive description of this argument:

> 'One important motive for diversification is associated with risk and uncertainty. A highly specialised firm will, in the event of a sharp downturn in the demand for its products, be faced with a drastic and perhaps fatal decline in profits. It is to guard against this sort of outcome that firms very often move into new product lines.'[2]

The modern developments of portfolio theory and capital market theory provide a more sophisticated analysis.[3]

Portfolio theory and risk diversification

Portfolio theory offers a systematic treatment of strategies for risk reduction by diversification where alternative forms of activity offer returns which are other than perfectly positively correlated. The forms of activity are usually taken to be investments in securities, but direct

---

1 K D George, Industrial organisation: competition, growth and structural change in Britain (London: Allen & Unwin, 1974).

2 George, p 43.

3 For descriptions of the theories generally, see, for example, J C Francis and S H Archer, Portfolio analysis (Englewood Cliffs, New Jersey: Prentice Hall, 1971); W F Sharpe, Portfolio theory and capital markets (New York: McGraw-Hill, 1970); and T E Copeland and J F Weston, Financial theory and corporate policy (Reading, Massachusetts: Addison-Wesley, 1979).

investment (undertaking propects in the production sector), as well as investment in physical commodities and any other arrangement offering returns, are equally amenable to analysis.

Portfolio analysis distinguishes between naive diversification and Markowitz efficient diversification. The distinction is based on the following characteristics of securities:

1 Future returns to any individual security are uncertain and consequently take the form of a probability distribution with an expected value, which constitutes a best estimate of the return, and a standard deviation, which measures the degree of risk associated with the particular return.

2 Future returns to any individual security will not be determined independently of returns to other securities. Rather, because of the complex inter-relationships which prevail in a modern economy, the returns to securities will tend to move together to a greater or lesser extent. The extent to which the returns to two securities move together is measured by their covariance.

3 Because returns tend to move together, the return to any particular security will tend to move in line with the return to the market portfolio, ie the portfolio containing all risky securities in the market weighted in proportion to the total value of each security. This tendency gives rise to systematic risk, which is measured by the covariance of the return to the security with the return to the market portfolio, termed beta. Hence the total risk associated with a particular security consists of (a) systematic risk and (b) unsystematic risk, ie the extent to which movement in the individual return differs from movement in the market return.

Naive diversification is the stategy implicit in vague appeals to 'spread risks by spreading investments' or 'avoid putting all your eggs in one basket'. This strategy ignores the existence of correlation between securities. By contrast,

> 'Markowitz efficient diversification involves combining investments with less than perfect correlation in order to reduce risk in the portfolio without sacrificing any of the portfolio's return. In general, the lower the correlation of the assets in a portfolio, the less risky the portfolio will be. This is true regardless of how risky the assets of the portfolio are when analysed in isolation.'[1]

If two securities can be found which are perfectly negatively correlated, it is possible to construct from them a portfolio with a unique, certain return, ie a riskless portfolio. Any combination of securities which are less than perfectly correlated will reduce risk to below the level attached to the securities individually. Hence naive diversification will be likely to reduce risk to a limited extent. Evans and Archer[2] have shown that naive diversification with large numbers of securities can reduce the riskiness of a portfolio to within reach of the level of systematic risk. However, the larger the number of securities in a portfolio, the more limited is the scope for further Markowitz efficient diversification, due to the scarcity of negatively correlated pairs of securities.

In an efficient market,[3] furthermore, opportunities to benefit from less

---

1 Francis and Archer, p 23, emphasis suppressed.

2 J L Evans and S H Archer, 'Diversification and the reduction of dispersion: an empirical analysis', Journal of Finance, 1968, pp 761-69.

3 For a discussion of the efficient market hypothesis, see M Firth, The valuation of shares and the efficient-markets theory (London: Macmillan, 1977); and T R Dyckman, D H Downes and R P Magee, Efficient capital markets and accounting: a critical analysis (Englewood Cliffs, New Jersey: Prentice-Hall, 1975).

than perfect positive correlation will be identified and pursued, thus driving the price of the relevant securities up and the return down. In the extreme case of a pair of securities with perfect negative correlation, the return from the securities would be reduced until the riskless return from the combination equalled the return from individual riskless investments. In general, the operations of an efficient market will be such as to eliminate the possibility of avoiding systematic risk, except by investment in riskless investments:

> 'The importance of beta is that it represents that part of risk that cannot be diversified away (by acquiring more securities).'[1]

Francis and Archer describe two empirical tests of the level of systematic risk on the New York Stock Exchange and conclude that,

> 'the similarity of the results of these two independent studies reinforces confidence in the estimate that about half of the total risk in most securities is systematic risk.'[2]

This would suggest that the potential reduction in risk available from even the most sophisticated and accurate Markowitz efficient diversification is limited, if the securities market is efficient. On this question, Firth writes:

> '[We have] reviewed some of the major empirical tests of the efficient-markets theory. Most of the researchers involved in these studies have concluded that their investigations provided no significant evidence against the [efficient market hypothesis].'[3]

---

1 Firth, p 92.

2 Francis and Archer, p 155.

3 Firth, p 139.

On the question of correlation between industries, Francis and Archer conclude that,

> 'The data show that few industries are negatively correlated and most are highly positively correlated. Thus, naive diversification even across different industries may not lower risk very much.'[1]

To what extent can conclusions derived from the analysis developed above be extended to the case of risk diversification by conglomerate growth? One question which arises is how far direct investment in projects requiring physical assets resembles portfolio investment in securities. The assumption of continuously variable levels of investment in physical projects is rather less realistic than in the case of portfolio investment, although for many such projects there will be some scope for varying the level of investment, and other strategies, such as joint ventures, may be used to add to the possibilities. In the case of those projects which are combinations of physical assets, the functioning of an efficient market would require that entrepreneurs identify risk reduction strategies speedily and move into suitably correlated projects, or rather, acquire suitably correlated assets, leading to price adjustments in both capital assets and consumer goods. That such forces should exist, with the strength necessary to give rise to efficient markets is perhaps less plausible than in the case of the securities market.

Even if the markets for physical propects are not efficient, however, the analysis would suggest that, in the face of high correlation between returns to different industries, the liklihood of naive diversification being efficient is remote.

---

1 Francis and Archer, p 154.

Capital market theory and risk diversification

Capital market theory explores the behaviour of capital markets under a restrictive set of conditions including the assumption that individuals in the market follow the rules established by portfolio theory. In a perfect market including a riskless security, and with common expectations, equilibrium will be established such that all investors will hold portfolios including the market portfolio and various positive or negative amounts of the riskless security (ie lending or borrowing). All securities (including assets and projects) must be in ownership, and will change hands in equilibrating adjustments at prices which will reflect returns and riskiness. Because investors have homogeneous expectations, any imbalance between the distribution of securities in different investors' portfolios will be eliminated as the investors with less-than-average holdings of a security seek the diversification available from buying more of it. The portfolios of these investors must (since all securities must be in ownership) contain more than the average quantity of some other security, which they must sell. Price movements will tend to be counterbalanced by the reciprocal desires of other investors to sell and buy. All prices will be set to clear the market when all investors hold market portfolios.

However, the individual riskiness of securities will not be relevant to trading decisions under the conditions specified, because investors are interested in the impact which the acquisition of any security will have on their portfolios, rather than in the riskiness of the security per se. Thus the price of individual securities will reflect the relationship between movements in the return offered by the security and returns in the market generally.

Levy and Sarnat[1] have demonstrated that under the conditions described above conglomerate mergers will yield no benefit for any investor in the market. The reason is, of course, that investors can achieve, and, in equilibrium, will have achieved, all the diversification which the state of nature permits in the construction of their individual portfolios. The terms of a rational merger between two companies will reflect the market values of their securities; the merged group will exactly resemble a portfolio combining all the securities of the original companies at values equal to their original market values. Thus the risk complexion of the market portfolio will not change and the opportunities available to investors in the market will be unaltered.

Levy and Sarnat go on to show that if an investor is constrained (by, for example, transactions costs, information processing limitations etc) to invest in a smaller number of securities than are available in the market, conglomerate mergers may be beneficial. This will come about if the merger occurs between a company whose securities are included in his portfolio and one whose securities are not. The merger effectively brings the new security into the investor's portfolio without violating the constraint on the number of securities to be held. In the face of market imperfections, whether the benefit comes about will depend on the effects of the merger on other parts of the market.

---

1 H Levy and M Sarnat, 'Diversification, portfolio analysis and the uneasy case for conglomerate mergers', Journal of Finance, 1970, pp 795-802.

Capital market theory and the communication of messages about risk

In their concluding remarks about the benefits of risk reduction by diversification, Francis and Archer remind their readers that,

> 'of course, accurate ex ante statistics are required to achieve these (or any) benefits from portfolio analysis.'[1]

Carsberg[2] has pointed to the consequences for communication between a company and its shareholders of attempts by the company to achieve risk diversification:

> 'If an individual holds the shares of a company in his portfolio, it is presumably because he has evaluated their expected returns and covariance with the market, using the best information available, and decided that the relationship is satisfactory. If the company then accepts a new investment ... the shareholders will be unaware of managers' expectations as to both expected returns and covariance. The shareholders may simply assume that any new projects will have a similar covariance with the market to that of previous activities - perhaps wrongly....
>
> It is an implication of our discussion that it is not important for a company to reduce risk by diversification .... Bearing this in mind, the best solution to the communication problem described in the last paragraph is perhaps for a company to attempt to undertake projects such that the aggregate returns from its activities have a more or less constant covariance with the market over time - according with the assumptions naturally made by shareholders. Given the difficulties in effective communication, it may be best for a company to deduce the assumptions of shareholders and attempt to conform with them rather than change its activities in a way that might be optimal given a perfect communication system.'[3]

---

1 Francis and Archer, p 158.

2 B Carsberg, Analysis for investment decisions (London: Accountancy Age Books, 1974).

3 Carsberg, pp 222-23.

Gearing and risk

The discussion so far in this section has been conducted from the standpoint of equity investors in securities and projects. Lewellen[1] offers a rationale for conglomerate growth based on the reduction in lenders' risk. A merger between two firms with identical gearing and less than perfectly correlated returns, or with different gearing and any pattern of returns, will flatten the distribution of returns and hence reduce the probability of outlying outcomes, including the severely bad outcomes which result in gambler's ruin (bankruptcy) for the firm and loss of capital for its creditors. Other parties (for example employees) will also have an interest in the avoidance by the firm of bankruptcy.

Galai and Masulis[2] have shown that the benefit described above does not reflect an increase in the value of the group (as against its constituent parts), which will not change since the total returns available and their riskiness will not change. Rather, the reduced lenders' risk will benefit lenders at the expense of equity holders. The relative wealth of the various classes of security holders can be restored to the pre-merger position by a variety of alternative devices, including an increase in the amount of debt with a consequent reduction in equity. This would have substantial transactions costs in the UK, but the differential tax consequences of payments to equity and debt holders will affect the after-tax value of the group. The welfare implications of these social redistributions will not be pursued here.

---

1 W G Lewellen, 'A pure financial rationale for the conglomerate merger', Journal of Finance, 1971, pp 521-45.

2 D Galai and R W Masulis, 'The option pricing model and the risk factor of stock', Journal of Financial Economics, 1976, pp 53-82.

9.4.2 Internalising the capital market

Needham[1] points out that,

> 'even in the absence of uncertainty, a firm will compare the extent to which diversification, as opposed to expansion of its existing activities, will best achieve the firm's objectives. A firm can be expected to diversify, rather than grow within the scope of its existing product structure, if the former alternative promises a higher prospective rate of return.'[2]

Williamson[3] casts the argument in rather more dynamic terms. He contrasts an economy in which the organisation of production is carried out by diversified corporations with one in which there are only unitary companies. If there is any tendency to retain funds,

> 'the ear-marking of funds in the latter would result in what would frequently be delayed responses to market signals and otherwise arbitrary allocations of investment. In the conglomerate-firm economy, by contrast, cash flows, from whatever source, are not automatically retained by the sectors from which these funds originate but are (ideally) assigned on the basis of prospective yields instead. The conglomerate acts in this respect as a miniature capital market.'[4]

The existence of relatively more attractive prospects elsewhere can come about from the decline or saturation of existing markets or the creation of new prospects in other markets. The existence of such circumstances need not automatically lead to diversification: a particularly self-sacrificing management might distribute the surplus funds and allow investors to make their own selections.

---

1 D Needham, Economic analysis and industrial structure (London: Holt, Rinehart and Winston, 1970).

2 Needham, p 127.

3 O E Williamson, 'Management discretion, organisational form and the multi-division hypothesis', in R Marris and A Wood (eds), The corporate economy (London: Macmillan, 1971).

4 Marris and Wood (eds), pp 374-75.

It is immediately apparent that the benefit described by Williamson must derive from a deficiency in the system; namely, the propensity of firms to retain funds. This defect has been attacked on a number of grounds,[1] but institutional and other constraints make it unlikely that it will be removed. A more generous view might be that managers can allocate capital more efficiently than investors in any event, and thus should be encouraged to retain funds and invest them on behalf of shareholders. Managers may well be more proficient at identifying profitable propects but they cannot of course take risk-return (and higher order) trade-off decisions on behalf of investors. Consequently, even if this latter argument is accepted, managers would still need to disclose sufficient information to enable shareholders to select their risk-return preferences.

The market-internalisation argument cannot be applied to the initial acquisition of a segment, where this is obtained by purchasing existing operations and funded by the issue of shares. It might be, however, that such an acquisition is necessary to provide scope for further investment of internally generated funds.

As a conglomerate grows larger, it seems likely that some of the same inefficiencies that are present in the external capital market (imperfect information, inertia, friction etc) will set in within the internal market of the conglomerate. Thus individual segments will retain funds and upset the 'ideal' distribution of capital.

The market-internalisation argument turns on efficiency and returns <u>at the margin</u>. The acquisition with external funds of a segment with higher average returns cannot be justified as necessary for the efficient use

---

1 See, for example, A Rubner, <u>The ensnared shareholder</u> (Harmondsworth, Middlesex: Penguin, 1965.

of surplus internal funds unless the marginal return exceeds the marginal return in existing sectors. Whilst full distributions of all profits are unlikely to occur, the choice at the margin remains (except where institutional constraints are very tight, eg dividend control) one between distribution and investment in a new segment. If the marginal return in the new segment is higher than in the existing business, there is surely a case not only for the diversion of new funds into the more attractive segment, but also for marginal disinvestment in the old segment.

The dynamic version of the model requires that management do more than simply identify an attractive segment and move into it; they must also be capable of managing the new group in such a way as to channel funds between segments in pursuit of the highest marginal returns. There are, as well as potential efficiencies, also potential inefficiencies from the internalisation of capital markets. For example, segments which contain heavy investments in central management ego may be cross-subsidised to an extent which is inefficient from both private and social points of view.

9.4.3 Managerial economies of scale

No matter how disparate the segments of a conglomerate are, there are at least two kinds of resources which can cross segmental boundaries: managerial skills and capital. Capital management has already been discussed; in this section the economies available from 'managing' management are examined.

Weston[1] offers three types of managerial economy:

> '1 Scale economies with utilisation of generic management functions.
> 2 Cost advantages in effective utilisation of specific management expertise.
> 3 Combining general management organisations of unequal quality.'[2]

Scale economies would be available from any increase in size, whether unitary or conglomerate, and other economies may be available externally by market transactions, including the use of professional and consultancy services and 'head hunting'.

9.4.4 Impure conglomeration

Some writers point to 'impurities' in conglomerate growth which will inevitably exist, and may lead to synergy, including economies in marketing and distribution. Newbould[3] investigated mergers in a search for synergy and concluded, in respect of a sample including both conglomerate and integrated growth, that,

> 'in some firms the managerial action had created synergic possibilities, and in some firms these could be substantial; in others, management action had been limited, and in a few nothing had been done which could be regarded as leading to synergy.'[4]

---

1 J F Weston, 'Conglomerate firms', in B S Yamey (ed), Economics of industrial structure (Harmondsworth, Middlesex: Penguin, 1973).

2 Yamey (ed), p 318.

3 G D Newbould, Management and merger activity (Liverpool: Guthstead, 1972).

4 Newbould, p 175.

9.5 CONGLOMERATE PERFORMANCE

Empirical evidence on the performance of conglomerates has been collected in a variety of studies.[1] The problems of specification and measurement are substantial,[2] and it is not suprising that the results of the studies are not entirely consistent.

The results of studies covering the operating characteristics of conglomerate mergers are ambivalent. Reid[3] concluded that conglomerate mergers did not increase aggregate earnings, whereas Weston and Mansinghka[4] found that conglomerate acquisitions improved the returns of poor performers. Later research has concentrated on market studies which suggest that the US market is now efficient (in the sense implied by the efficient market hypothesis) in its dealings with conglomerates, although it may have been systematically optimistic in the first years after the form emerged.[5]

---

1 For a brief summary of the literature, see Copeland and Weston, chapter 17.

2 For a discussion of some of these problems, see R J Briston and D G Rhys, 'Problems in the analysis of statistics relating to takeovers and mergers', in J Samuels (ed), Readings on mergers and takeovers (London: Paul Elek, 1972).

3 S R Reid, Mergers, managers and the economy (New York: McGraw-Hill, 1968).

4 J F Weston and S K Mansinghka, 'Tests of the efficiency performance of conglomerate firms', Journal of Finance, 1971, pp 919-36.

5 Alternatively, there may have been specification errors in the earlier studies.

9.6 ACCOUNTING FOR EXTERNAL BOUNDARY CONDITION MANAGEMENT

9.6.1 The consequences of diversification

The central theme of the present research is that diversification of an entity's activities involves an inevitable reduction in the quality of information which can legitimately be provided about the entity. This is not merely a reduction in the quantity of information which an entity is obliged to communicate; such a loss could be made good by appropriate changes in the regulations. Rather, it is a reduction in the scope for the provision of information. If it is accepted that accounting reports can enhance the relationship of accountability between entities and interested parties, the information loss from diversification must mark a deterioration in this relationship. This represents an important accounting reason for resisting diversification.

Individual diversifying moves differ in the extent of the 'gap' between new and existing operations. There is a tension between the size of the gap and the extent of the interaction problem: the larger the gap, the less severe the interaction problem is likely to be; however it is also the case that the larger the gap, the lower the economic benefits are likely to be, at least from the point of view of the shareholders.[1]

Even if there are few interactions, and therefore little to benefit shareholders, as a result of a particular merger, the identification problems discussed in previous chapters will affect the scope for information provision.

---

1 Parties who might suffer from the 'gamblers' ruin' of the entity (for example loan stock creditors and employees), or who gain utility directly from the activities of the entity (for example mangers), will have different interests.

These considerations suggest that shareholders and other interested parties should exercise some degree of control over changes in the organisation's external boundaries, and that, in accounting for external boundary condition management, benefits from diversification will have to be demonstrated which outweigh the cost of reduced scope for information provision.

9.6.2 The levels of decision-making in external boundary condition management

As discussed in section 9.2, decisions about changes in external boundaries are taken at a variety of levels. Disclosure of higher level decisions, which involve policy commitments rather than the disposition of material amounts of resources, would be useful because such decisions are very important, yet can typically be changed at very little cost. Preferences on the part of interested parties about conglomerate growth can generally be expressed separately from views about the merits of individual operating decisions, yet at the moment it is very difficult, for example, for a shareholder voting about an increase in authorised share capital to facilitate a particular merger to express a view about diversification in general.

The regulation of disclosure of higher-level decisions will not be an easy matter, in view of the abstract nature of such decisions, the lack of objective evidence that a decision has been taken, and the fact that decisions will not necessarily be taken in descending order. Decisions at level 3 may be very numerous and individually immaterial. If higher level decisions are properly accounted for, there may be no need (at any rate on the basis of contemporary divisions of function between owners

and managers) to disclose such decisions separately. Material decisions may need to be disclosed, however, as a back-up to requirements established for higher level decisions.

9.6.3 The information to be disclosed

The argumentation of this study does not permit the specification of detailed reporting requirements, and a substantial research effort will be necessary before such specifications can be produced. It seems reasonable to suggest that in accounting for external boundary condition management, some weight should be attached to the rationale for any proposed diversification. Consequently the particular information disclosed in relation to a proposal will have to vary according to the rationale for that proposal. If interested parties are given a proper measure of control over boundary condition management, they may demand information appropriate to the consideration of specific proposals. This will, of course, require that arrangements are made for the education of the interested parties, and the advisers who serve them.

If the rationale for diversification is risk diversification, management will need to show that the decision can be justified in Markowitz efficient terms. Level 1 decisions will become increasingly difficult to justify as the number of segments increases. Level 2 decisions will need to be justified by evidence - preferably in quantitative terms - that returns from the new sector are correlated with existing returns in the appropriate way.

If the rationale is the internalisation of capital allocation, management

will need to show that internal allocation by diversification is efficient. In the face of evidence for the efficiency of the capital market, management will need to demonstrate that the transaction costs of returning funds for redistribution by shareholders exceed the benefits therefrom, or that, in the case of projects, there are inefficiencies in the market. Decisions at levels 1 and 2 should involve the use of internal funds, or at least open up the possibility of the use of such funds.

If the rationale is the reaping of managerial economies of scale, or the creation of synergy, management will need to demonstrate that these are indeed available.

9.7 DISINVESTMENT

Much of the preceding analysis applies with equal force to the case of disinvestment, which can be achieved either by sale or by 'running down' operations. The current state of disclosure requirements and control in this area is poorer even than the equivalent arrangements for acquisitions. Gradual running down, particularly if achieved without the disposal of major assets by sale, is almost certain to be accomplished without ever being subject to positive control by shareholders.

It is not necessary to repeat all that has already been said about acquisitions. Just as operations acquired, once absorbed into the group, can no longer be measured as if they were independent, so it is impossible to measure how operations which have been disposed of would have performed if they had still been part of the group. Nonetheless, it might be possible to give some indications which might assist in the ex

post appraisal of a decision to disinvest (which could also have been the subject of ex ante disclosure). If the operations are sold and subsequently continue independently, it might be possible to report their results, although, of course, it is not necessarily the case that their performance would have been the same if they had remained within the group. If the operations were run down or absorbed into another group, it may be possible to give some indication of the performance of the sector generally. If the management felt that this evidence was misleading, they would of course be free to say so, explaining why.

Chapter 10

THE BOUNDARY CONDITION MANAGEMENT MODEL: (II) INTERNAL BOUNDARIES

10.1 INTERNAL BOUNDARY CONDITION MANAGEMENT

10.1.1 The location of internal boundaries

One important aspect of the design of internal boundaries is the decision as to their location; that is to say, how the organisation is partitioned into operating sub-systems (called hereafter divisions). The traditional literature on the financial control of divisionalised organisations is largely silent on the subject of internal boundary location. Tomkins[1] proceeds directly from a discussion of 'divisionalisation and related concepts'[2] to methods for 'planning the division's current operations',[3] in which the existence of particular boundaries is taken as given. By the same token, Horngren[4] proceeds directly from the 'nature of decentralisation'[5] to 'systems design and decentralisation',[6,7], and Bierman and Dyckman[8] proceed from the desirability of decentralisation to 'the need for transfer prices'.[9]

---

1 C Tomkins, Financial planning in divisionalised companies (London: Accountancy Age Books, 1973).

2 Tomkins, title of chapter 1.

3 Tomkins, title of section 2.1.

4 C T Horngren, Cost accounting: a managerial emphasis (Third edition; Englewood Cliffs, New Jersey: Prentice-Hall, 1972).

5 Horngren, section heading, p 692.

6 Horngren, section heading, p 696.

7 By systems, Horngren here means accounting systems.

8 H Bierman and T R Dyckman, Managerial cost accounting (London: Collier-Macmillan, 1971).

9 Bierman and Dyckman, section heading, p 220.

However, internal structure is not handed down by external sources, nor is a single structure usually the inevitable consequence of the circumstances of divisionalisation. Thus management will have a range of discretion in designing internal boundaries. They will need to take account of the functions of diversification in determining the internal structure of the organisation, and to show that they have done so.

10.1.2 Control of organisational boundaries

An important change in the organisational structure following the adoption of the conglomerate form is the addition of a new 'layer' of management - a layer concerned not with operational decisions, but with,

> 'decisions relating to the rate and pattern of growth of the organisation, and the allocation of investment funds to production divisions (and the maintenance, therefore, of procedures for evaluating the divisions' requests for funds)'.[1]

The positive aspects of this function have been well expressed by Channon.[2] He describes how American industry came to adopt a multidivisional structure, and how,

> 'The adoption of this new organisational form permitted some reestablishment of the entrepreneurial functions of the enterprise. The general office, charged with responsibility for strategic decisions and the allocation of resources, could pursue a policy of long-term profit maximisation for the enterprise as a whole. The general executives had no specific commitment to any one activity. Their commitment was to the total enterprise, and the divorce of policy from operations permitted objective appraisal rather than subjective and frequently factional judgement. In theory, therefore, the quasi-independent

---

1 R Marris, 'The modern corporation and economic theory', in R Marris and A Wood (eds), The corporate economy (London: Macmillan, 1971), p 276.

2 D F Channon, The strategy and structure of British enterprise (London: Macmillan, 1973).

> divisions could be likened to a series of portfolio investments which could be bought or sold without serious impact on the overall corporation. The general office acted as a small, yet highly efficient, capital market with powers of direct and rapid intervention in divisional activities if and when the need arose.
>
> The structure conceivably permitted the enterprise to transfer its resources readily to the most profitable areas or to divisions and to division managers of proven ability. The development of general management skills permitted new activities to be added without serious impact to the existing structure of the enterprise. Further, it created the fund of general management skills with which to administer such ventures. The system encouraged internal competition as well as external market competition between the division managers, since the scarce resources of the enterprise were allocated on the basis of measurable performance for each independent subunit.'[1]

The traditional approach to boundary condition management is based on a 'policing' operation. Solomons,[2] for example, writes,

> 'It is a further condition for full success that relations between divisions should be so regulated that no division, by seeking its own profit, can reduce that of the corporation.'[3]

By contrast, the popular literature on conglomerate diversification has tended to emphasise the opportunities for the promotion of cross-boundary economies, and 'synergy' found an exalted position in the theology of mergers in the late 1960's. Synergistic potential is still regarded with awe:

> 'Elsewhere the companies' differences look less of a handicap, to be eliminated at the earliest possible opportunity, than a positive advantage. The fact, for example, that foreign match and razor blade operations don't by and large overlap geographically should be a considerable aid to the expansion of both. This argument was one which the companies developed at some length for the Monopolies Commission, which reported that one of the main attractions of the merger for Wilkinson was "that the existence of

---

1 Channon, pp 3-4.

2 D Solomons, Divisional performance: measurement and control (Homewood, Illinois: Irwin, 1965).

3 Solomons, p 11.

> British Match 'substance' in countries in which Wilkinson is not, or is not strongly, represented could provide what both companies claim from their experience is an indispensable basis under modern conditions for an attack upon an unfamiliar market." And it is difficult to argue with the claim.'[1]

> 'One of [Pentos'] bigger lines is the exploitation of licensed characters. Among those to which it has rights are the Wombles, and Wombles have begun to ingratiate their way into other parts of the business - the home and gardens operation tried out Womble runs as a novelty.'[2]

> 'The last major acquisition ... was A B Fleming (Holdings), which manufactured paints, printing inks, and synthetic resins, in 1971. Once more, there was some considerable synergy. Croda was already in paints, and Flemings had a small paint operation. Printing inks are manufactured with a very similar technology to paints, the raw materials are similar, the equipment is similar, and both processes are waterborne.... Croda built up the paints side rapidly to make it one of the eight largest manufacturers in the country....'[3]

More systematically conducted studies[4] have cast doubts on the importance of synergy. It seems likely, nonetheless, that there will normally be some scope for cross-boundary economies, and that conglomerate acquisitions will at any rate be promoted in terms of synergistic potential.

In the orthodox model, opportunities for economies occuring across boundaries are seen as giving rise to the problem of valuing inter-divisional transfers; perhaps, however, they should be viewed more positively, as being interesting in themselves and worth reporting in financial accounts. Although it is not possible to allocated the benefit

---

1 S Caulkin, 'Wilkinson makes a safety match', Management Today, November 1974, p 77, first emphasis supplied; second emphasis added.

2 C Mansell, 'Pentos Wombles on', Management Today, February 1975, p 114.

3 C Mansell, 'Croda's natural selection', Management Today, October 1975, p 64, emphasis added.

4 See section 9.5.

from economies between segments, it will often be possible to give some account of the existence and extent of the benefit to the group.

10.1.3 Accounting for internal boundary condition management

The management of a diversified organisation (as opposed to the managements of the divisions) represents a new level of managerial activity not present in a unitary organisation; its success or failure is a reflection of, but, in the short term, is not measured by, the success or failure of the divisions. Hence it must be accounted for separately.

Although there is at present only limited guidance available to management on the location and construction of internal boundaries, management will need to disclose information in order to persuade shareholders (and other interested parties) that they are performing their functions as satisfactorily as possible. It is not yet possible to prescribe the information which would be necessary, but, as in accounting for external boundary condition management, an appropriate beginning would be to educate users of accounting information, especially those with some measure of influence over the management, to understand the importance of the requisite management skills and to expect to receive information about them.

An important aspect of this expectation will be that where benefits from diversification are claimed ex ante,[1] management should provide evidence (a) that they are taking steps to secure these benefits, and (b) about the extent to which the benefits are subsequently realised.

---

1 See chapter 9 and the quotations at pp 238-39.

10.2 INTERNAL BOUNDARIES AND SEGMENT DEFINITION

One of the subsidiary themes of the present study is that the nature of industrial activity is such that it is generally impossible to identify discontinuities in the spectrum of such activity which might form universally recognisable and enforceable segment definitions. The consequences of this and other problems for the process of segment definition have been discussed at various points in this study;[1] the purpose of this section is to consider the proposal which has been discussed by various writers[2] that segment definition should follow the internal structure of the organisation. This proposal is generally rejected in the orthodox model as leading to a lack of comparability between organisations and arbitrariness in relation to industrial structure. In the face of the impossibility of devising an externally determined scheme which would be universally applicable, however, it may be appropropriate to use internal boundaries as the basis for a particularistic scheme which can be applied to individual organisations.

The use of internal boundaries as a basis for a disaggregative scheme of reporting would have certain advantages. Divisions are 'real-world' structures which can provide a starting point (which will itself be veritable) for a veridical disaggregative reporting scheme. The normal organisational structure of a divisionalised firm will be likely to minimise the extent of (though not, of course, to eliminate) interaction, and to make it relatively easy to measure and control.

---

1 Notably in sections 1.1 and 3.2.2, pp 27-30.

2 See, for example, R K Mautz, 'Bases for more detailed reporting by diversified companies', Financial Executive, November 1967, pp 52-54, 56-58, 60; and N R Yarian, 'Segmentation for reporting purposes', Management Accounting (USA), April 1975, pp 16-20, 23.

If the accounting numbers which are being reported are of interest to management, then it is likely that they would in any event be prepared for internal management purposes (as is generally the case for the orthodox model) and thus the incremental cost of reporting such information to outside parties will be low. Where, quite independently of any financial reporting requirements, managers are found to be using information reported at the divisional level, there is perhaps an argument that others (especially shareholders) will also be likely to be interested in the same information, although such arguments are strictly outside the scope of this study.

In some cases, internal boundaries will coincide with industrial sectors or other desired segment definitions:

> 'For some companies [in Mautz's survey], a close relationship existed between organisational units and their major product lines, leading to the conclusion that in a broad sense they are organised on a product line basis. For almost as many other companies, there was very little relationship between organisational units and products.'[1]

It is perhaps worth emphasising that the use of internal boundaries as segment definitions will not lead to complete managerial discretion over the reporting scheme, unless managers are prepared to allow their control systems to be distorted to whatever degree is necessary to achieve their desired segment definitions.

It is sometimes argued that segment definitions following internal boundaries will produce information which will not be comparable between

---

1 R K Mautz, Financial reporting by diversified companies (New York: Financial Executives Research Foundation, 1968), p 148.

organisations, since divisions in different organisations will encompass different activities:

> 'The "Chemical Division" of Martin Marietta Company includes: printing ink, dyestuffs, concrete additives, and industrial sand. Compare these chemicals with Warner Lambert's chemicals which are sophisticated pharmaceutical materials. The division names are the same; however, the companies and the products are quite different and divisional comparison is pointless.'[1]

Alternatively, changes in activities may destroy comparability through time:

> '... it is possible that the division being reported will be, at best, only an approximation of the same division the year before. Therefore, reports for divisions of one year may not be at all comparable with reports for apparently equivalent divisions of another year.'[2]

These problems are, however, simply manifestations of the general difficulties of comparison existing at every level in financial reporting; for example, two unitary organisations in the same industry will sell differentiated products, and may change their activities through the course of time.

Some of the proposals made in this study, and notably the cash flow model discussed in section 8.5 require the definition of segments by some means or another. Since the models will initially be in an experimental state, it would be reasonable to employ internal boundaries in a definitional scheme, possibly as one of a variety of such schemes.

---

1 Yarian, p 18.

2 Yarian, p 19.

Chapter 11

SUMMARY AND CONCLUSIONS

This study begins by exploring the naive view of the production sector as consisting of a series of industries, each separated from the others by discontinuities which serve as universally recognisable boundaries. According to this view, diversification involves 'vaulting' across a boundary and thus combining activities from two or more separate industries, although the discontinuities will prevent interaction between the activities so combined. It is suggested that the nature of the production sector actually requires a more sophisticated approach in which industrial activity is viewed as varying continuously along a number of dimensions without substantial breaks which could be taken as unambiguous definitions of industries. Empirical evidence suggests that the degree of diversification present in western industrial economies is increasing. A number of authoritative bodies have expressed the view that diversified organisations should disclose disaggregated information relating to their various industrial activities and it is arguable that the aggregative information disclosed by all entities will represent a lower quality of reporting in the case of diversified organisations because it will be more difficult to place the information in proper context. Hence, there is a need for appropriate financial disclosure for diversified operations (FDDO) and that is the subject of this study.

Chapter 2 establishes the ground for the arguments of the study. Making the common-sensical assumption that there exists a world outside the perceptions of observers, it advances the case for verity (in addition to usefulness) in financial reporting. If reports are to be veritable, they must (i) purport to be about the real world, (ii) have real-world referents,

(iii) be testable, and (iv) actually be tested and pass the test. Arrangements which generate veritable reports are called veridical reporting schemes. Such schemes are advocated on the grounds that they promote auditability, ensure an enduring relationship between accounting reports and the real world, and provide a general defence of accounting reports which are of use to only a limited range of parties. The search for veridicality is proposed as one part of a broader strategy in which usefulness also has an important part to play. Veritable reports must be able to be read from left to right, that is to say accounting numbers should describe the real-world object specified by a given label; labels should not be given a meaning which derives solely from accounting numbers and the machinery which generates them. This study sets out to enquire if the orthodox FDDO model is a veridical reporting scheme. It seeks to establish whether the reports produced by the model are credible (ie capable of being about the real world) or mythical.

The third chapter sets out the orthodox model for FDDO. Several variants, including those developed by accounting bodies and legislatures and several proposals for reform are examined. The model attempts to disaggregate the information reported for the organisation as a whole so that the same items of information can be given for each segment. It is demonstrated that the orthodoxy generally recognises the need to perform allocations in order to obtain the disaggregated information.

Chapter 4 surveys current UK reporting practice in the area. The structure of the legislation frustrates any attempt to measure compliance but the evidence of the survey suggests that there is a substantial degree of avoidance of the duty to report segmental results and widespread

inconsistency between segmental reports which are published. These conclusions are confirmed by other studies.

The fifth chapter explores the nature of allocations and the impact of the need for allocations in the orthodox FDDO model. The allocations required by the model are to be made according to the criterion of benefit. Following the work of A L Thomas, it is demonstrated that, in the presence of interaction between segments, allocations cannot have real-world referents, and therefore the accounting reports generated by the orthodox model must be mythical (ie incapable of being about the real world). This conclusion is applicable to both the treatment of common costs and the determination of prices for inter-segmental transfers. The traditional distinction between these is argued to be largely uninformative, and a new taxonomy is proposed. In the taxonomy, cost elements are defined as the smallest divisions of a cost entry or group of entries in the accounting records to which a separately identifiable benefit can be traced. It is argued that the legitimate disaggregation of cost entries and the improper allocation of cost elements are often confused. The widespread view that interaction and commonality can readily be identified because they will occur in only a limited range of cost categories (for example, general meeting expenses) or budget centres (for example, head office) is examined and rejected; interaction effects are extensive, pervasive and diffused.

Chapter 6 explores some procedures for avoiding the allocation problem whilst continuing to employ a disaggregative approach within the traditional framework. If interactions can be detected and measured adequately, they can be disclosed separately, although this will make the architecture of the reports extremely complex. The 'defined profit' model sometimes

proposed as a means of dealing with the allocation problem is shown to violate the requirement that accounting reports should be capable of being read from left to right. The range of ambiguity, a measure which summarises the relationship between independent and interaction efects in an accounting accounting report is examined. It is suggested that this measure may be difficult to interpret. Both separate disclosure and the use of the range of ambiguity require that interaction effects can be identified and measured and it is suggested that the currently available machinery for this is likely to be unsatisfactory for a variety of reasons.

The following chapter examines some proposed systems of allocation in the context of FDDO. An omniscient paternalist might use sterilised allocations (ie allocations which are known in advance not to lead to erroneous decisions) to guide irrational or bemused decision-makers to appropriate decisions established outside the model in question, for example by providing redundant but comforting information, by coding information to keep it out of the hands of misguided users or by leading to enhanced parameter estimation. It is suggested that this approach will be of limited use since it is unlikely that omniscient paternalists exist, and, if one could be found, he would presumably require veritable reports to reach his independent conclusions, and thus these will still need to be developed. Further, given heterogeneous users, a variety of conflicting reports will have to be generated, with the danger that these will come to the attention of other users besides those for whom they were intended. This will undermine confidence in the system. Predictive ability is also examined as a framework for generating reports but the specification of published statistical and causal studies is found to be unsatisfactory. Further, such reports will not be veritable.

The eighth chapter begins the search for a veridical reporting scheme. Three aspects of the development of such a scheme are discussed. First, the value of multiple operationalism is described: a battery of veritable measures which bear on the object of interest will be superior to a single measure which claims to capture exactly the dimension of interest but is not credible or has dysfunctional side-effects. Secondly, the position of users' goals in the interpretation of veritable reports is explored and it is demonstrated that, although veritable reports do not treat such goals as being of primary importance, they may nonetheless be useful to users having objectives and seeking to further them. Thirdly, the tension between multiple operationalism and information overload is discussed. It is accepted that the conflict here is serious, but it is suggested that the nature of the conflict will be better able to be investigated when a veritable data base is available for testing. The remainder of the chapter explores some aspects of the operations of diversified organisations which might form the subject of veritable reports. A cash flow model is examined and it is demonstrated that the segmental information sometimes proposed as part of such a model will require allocations on the same footing as those of the traditional accruals model; however, it is suggested that a disaggregative framework might be constructed in such a way that distortions could be controlled (the tangled web principle), and that such distortions may be better able to be understood by users of accounting reports than the distortions which arise in the accruals model. Other resources are also considered as candidates for veritable reports. Similar problems arise but there is some scope for experimentation within a framework of multiple operationalism and veridicality.

Chapter 9 discusses the boundary condition management model developed in the literature of general systems theory. It holds that the primary

function of management is to establish and control the boundaries between systems of activity within organisations, since these are the only points in organisations at which inputs and outputs can be measured. The model can be applied at many levels within organisations, including the relatively aggregated level at which segmental reporting occurs. External boundaries (ie the boundaries between organisations and their environments) are examined first. The processes by which external boundaries come to be changed are complex; disclosure and control in the initial stages of the change are more difficult to achieve yet, because variation is less disruptive then, it may be worth attempting to provide external parties with some measure of control in these stages, and with appropriate information. It is suggested that the current state of disclosure requirements and arrangements for control by external parties is inadequate. The rationale for diversification is analysed; the theoretical literature and empirical studies suggest that the benefits of risk reduction, efficient capital allocation and synergy may be available in particular instances but should not be taken for granted. In the face of a reduction in the quality of information available as a consequence of diversification, parties with an interest in an organisation should weigh the costs and benefits available to them and exercise their influence accordingly; to do this they will require information about the change. This study does not go far enough to permit the detailed specification of a reporting scheme. As a preliminary step, perhaps users should be encouraged to expect to receive information from management appropriate to individual cases. They would also need to be educated so as to know what to do with the information when it is made available. The development of the literature in such areas as capital market theory permits a more sophisticated approach than is normally adopted in practice.

The concluding chapter examines the management of internal boundaries within the organisation. In a diversified organisation a new layer of management emerges with the function, not of managing the operations of the segments, but of managing the configuration in which segments are brought together. The traditional approach in the literature of financial control is to treat this as a 'problem' requiring a solution involving the monitoring and 'policing' of cross-boundary activity. It is suggested that a more positive approach may be beneficial. In accounting for internal boundary condition management, the suggestions made in this study are similar to those made in relation to external boundaries. Finally, the possibility of using internal boundaries as segment definitions is explored. Internal boundaries are themselves real-world objects and may form the starting-point for a veridical reporting scheme. They could be employed as one of several definitions during the course of experimentation.

The continuous nature of industrial activity discussed in the opening chapter pervades the analysis of this study. It makes the process of defining segments extremely difficult and it makes the existence of interaction almost inevitable. In the face of the latter problem, the orthodoxy of financial disclosure for diversified operations cannot yield veritable reports. Other reporting schemes must be developed and a great deal of further research is necessary. In the meantime, segmental reports must be treated with extreme caution.

BIBLIOGRAPHY

Accountants International Study Group. Reporting by diversified companies. London: Institute of Chartered Accountants in England and Wales, 1972.

Accounting Principles Board Statement Number 2: Disclosure of Supplemental Financial Information by Diversified Companies. New York: American Institute of Certified Public Accountants, 1967.

Accounting Standards Steering Committee. The corporate report. London: Accounting Standards Steering Committee, 1975.

Alexander, B. 'Analysed reporting - yes or no?' Accountancy, October 1976, pp 96-100.

Allen, M (ed). The Times 1000. London: Times Newspapers, 1974.

American Accounting Association. A statement of basic accounting theory. Sarasota, Florida: American Accounting Association, 1966.

American Accounting Association. Report of the Committee on Non-Financial Measures of Effectiveness, Supplement to Accounting Review, 1971, pp 164-211.

American Accounting Association. Report to the Financial Accounting Standards Board from the Subcommittee on Financial Accounting Standards. Sarasota, Florida: American Accounting Association, 1974.

American Institute of Certified Public Accountants. Objectives of financial statements (Report of the Study Group on the Objectives of Financial Statements). New York: American Institute of Certified Public Accountants, 1973.

Backer, M and McFarland, W B. External reporting for segments of a business. New York: National Association of Accountants, 1968.

Baker, F (ed). Organisational systems: general systems approaches to complex organisations. Homewood, Illinois: Irwin, 1973.

Barefield, R M and Comiskey, E E. 'Segmental financial disclosure by diversified firms and security prices: a comment', Accounting Review, 1975, pp 818-25.

Barr, A. 'Comments on the conglomerate reporting problem', Financial Executive, November 1967, pp 39-46.

Barr, A. 'The developing debate on line of business disclosure', Management Accounting (USA), December 1967, pp 18-22.

Barr, A. 'Need for product line reporting', Journal of Accountancy, January 1968, pp 46-49.

Barron, C. 'How Berisford traded up', Management Today, November 1976, pp 67-73, 146, 148, 152.

Baumes, C G. Allocating corporate expenses (Studies in Business Policy Number 108). New York: National Industrial Conference Board, 1963.

Baxter, W T and Davidson, S (eds). Studies in accounting. London: Institute of Chartered Accountants in England and Wales, 1977.

Berry, C H. 'Corporate growth and diversification', Journal of Law and Economics, 1971, pp 371-83.

Bierman, H and Dyckman, T R. Managerial cost accounting. London: Collier-Macmillan, 1971.

Bodnar, G and Lusk, E J. 'Motivational considerations in cost allocation systems: a conditioning theory approach', Accounting Review, 1977, pp 857-68.

Bows, A J. 'Problems in disclosure of segments of conglomerate companies', Journal of Accountancy, December 1966, pp 33-37.

Briloff, A J. Unaccountable accounting. New York: Harper Row, 1972.

Burston, J R. Reporting for diversified companies. N p: ICI, 1976.

Caldwell, J C and Ingram, R W. 'Management accountants respond to segment reporting', Management Accounting (USA), November 1976, pp 37-41.

Canada Business Corporations Act 1975 (Canada).

Canada Corporations Act 1965 (Canada).

Canadian Institute of Chartered Accountants Handbook. Toronto: Canadian Institute of Chartered Accountants, 1971.

Canning, J B. The economics of accountancy. New York: Ronald Press, 1929.

Carsberg, B. Analysis for investment decisions. London: Accountancy Age Books, 1974.

Caulkin, S. 'Wilkinson makes a safety match', Management Today, November 1974, pp 74-77, 79-81.

Channon, D F. The strategy and structure of British enterprise. London: Macmillan, 1973.

Cohen, M F. 'Analysts, accountants and the SEC - necessary joint efforts', Journal of Accountancy, August 1966, pp 57-62.

Cohen, M F. 'The SEC and accountants: co-operative efforts to improve financial reporting', Journal of Accountancy, December 1966, pp 56-60.

Collins, D W. 'Predicting earning with sub-entity data: some further evidence', Journal of Accounting Research, 1976, pp 163-77.

Companies Act 1948.

Companies Act 1967.

Copeland, T E and Weston, J F. Financial theory and corporate policy. Reading, Massachusetts: Addison-Wesley, 1979.

Cost Accounting Standards Board. 'Operating policies, procedures and objectives of the Cost Accounting Standards Board', Financial Executive, July 1973, pp 54-55, 73.

Cramer, J J. 'Income reporting by conglomerates: views of American businessmen' , Abacus, 1968, pp 17-26.

Cramer, J J, Crumbley, D L and Arch, T B. 'Allocation of federal income taxes to divisions of the conglomerate', New York Certified Public Accountant, 1969, pp 39-47.

Cramer, J J and Iwand, T. 'A proposal for conglomerate disclosure - the contribution form income statement', Business Horizons, April 1968, pp 49-59.

Davies, P. The regulation of takeovers and mergers. London: Sweet and Maxwell, 1976.

Dyckman, T R, Downes, D H and Magee, R P. Efficient capital markets and accounting: a critical analysis. Englewood Cliffs, New Jersey: Prentice-Hall, 1975.

Eckel, L G. 'Arbitrary and incorrigible allocations', Accounting Review, 1976, pp 764-77.

Edey, H and Yamey, B S (eds). Debits, credits, finance and profits. London: Sweet and Maxwell, 1974.

Emmanuel, C R and Gray, S J. 'The segment reporting issue', Management Accounting, July/August 1977, pp 296-97.

Emmanuel, C R and Gray, S J. 'Corporate diversification and segmental disclosure requirements in the USA', Journal of Business Finance and Accounting, 1977, pp 407-18.

Emmanuel, C R and Gray, S J. 'Segmental disclosure and the segment identification problem', Accounting and Business Research, 1977, pp 37-50.

Emmanuel, C R and Gray, S J. 'Presentation of segment reports', Accountancy, June 1978, pp 91-92.

Evans, J L and Archer, S H. 'Diversification and the reduction of dispersion: an empirical analysis', Journal of Finance, 1968, pp 761-69.

Fair Trading Act 1973.

'FASB backs down', Accountants Weekly, 9 December 1977, p 6.

Financial Accounting Standards Board. Discussion memorandum: an analysis of issues related to financial reporting for segments of a business enterprise. Stamford, Connecticut: Financial Accounting Standards Board, 1974.

Financial Accounting Standards Board Proposed Statement of Financial Accounting Standards: Financial Reporting for Segments of a Business Enterprise. Stamford, Connecticut: Financial Accounting Standards Board, 1975.

Financial Accounting Standards Board Statement of Financial Accounting Standards Number 14: Financial Reporting for Segments of a Business Enterprise. Stamford, Connecticut: Financial Accounting Standards Board, 1976.

Financial Accounting Standards Board Statement of Financial Accounting Standards Number 18: Financial Reporting for Segments of a Business Enterprise - Interim Financial Statements. Stamford, Connecticut: Financial Accounting Standards Board, 1977.

Financial Accounting Standards Board Statement of Financial Accounting Standards Number 21: Suspension of the Reporting of Earnings Per Share and Segment Information by Nonpublic Enterprises. Stamford, Connecticut: Financial Accounting Standards Board, 1978.

Firth, M. The valuation of shares and the efficient-markets theory. London: Macmillan, 1977.

Francis, J C and Archer, S H. Portfolio analysis. Englewood Cliffs, New Jersey: Prentice-Hall, 1971.

Galai, D and Masulis, R W. 'The option pricing model and the risk factor of stock', Journal of Financial Economics, 1976, pp 53-82.

George, K D. Industrial organisation: competition, growth and structural change in Britain. Second edition; London: Allen & Unwin, 1974.

Grady, P. Inventory of generally accepted accounting principles (Accounting Research Study Number 7). New York: American Institute of Certified Public Accountants, 1965.

Gray, S J. 'Segment reporting and the EEC multinationals', Journal of Accounting Research, 1978, pp 242-53.

Hadden, T. Company law and capitalism. Second edition; London: Weidenfeld and Nicolson, 1977.

Halvorson, N T. 'Accounting aspects of conglomerate reporting', Business Lawyer, 1968, pp 549-60.

Hamlen, S S, Hamlen, W A and Tschirhart, J T. 'The use of core theory in evaluating joint cost allocation schemes', Accounting Review, 1977, pp 616-27.

Hannah, L. The rise of the corporate economy. London: Methuen, 1976.

Hendriksen, E S. Accounting theory. Homewood, Illinois: Irwin, 1970.

HMSO. The future of company accounts (Cmnd 6888). London: HMSO, 1977.

Horngren, C T. Cost accounting: a managerial emphasis. Third edition; Englewood Cliffs, New Jersey: Prentice-Hall, 1972.

Institute of Chartered Accountants in England and Wales. Survey of published accounts. London: Institute of Chartered Accountants in England and Wales, annual.

Jensen, D L. 'A class of mutually satisfactory allocations', Accounting Review, 1977, pp 842-56.

Joint Memorandum to the Board of Trade by the Institute of Chartered Accountants in England and Wales, the Institute of Chartered Accountants of Scotland and the Association of Certified and Corporate Accountants, The Accountant, 28 Janunary 1967, p 111.

Kemp, P S. 'Contribution margin reporting for diversified companies', Management Accounting (USA), May 1968, pp 14-17.

Kinney, W R. 'Predicting earnings: entity versus sub-entity data', Journal of Accounting Research, 1971, pp 127-36.

Kitching, J. 'Why acquisitions are abortive', Management Today, November 1974, pp 82-87, 148.

Kochanek, R F. 'Segmental financial disclosure by diversified firms and security prices', Accounting Review, 1974, pp 245-58.

Lamb, A F. Analysed reporting: a background study. London: Institute of Chartered Accountants in England and Wales, 1977.

Lee, T A. 'A case for cash flow reporting', Journal of Business Finance, 1972, pp 27-36.

Lee, T A. Company auditing: concepts and practices. London: Gee for the Institute of Chartered Accountants of Scotland, 1972.

Lee, T A. 'Enterprise income: survival or decline and fall?' Accounting and Business Research, 1974, pp 178-92.

Lee, T A and Tweedie, D P. The private shareholder and the corporate report. London: Institute of Chartered Accountants in England and Wales, 1977.

Lev, B. Accounting and information theory (Studies in Accounting Research Number 2). Evanston, Illinois: American Accounting Association, 1969.

Levy, H and Sarnat, M. 'Diversification, portfolio analysis and the uneasy case for conglomerate mergers', Journal of Finance, 1970, pp 795-802.

Lewellen, W G. 'A pure financial rationale for the conglomerate merger', Journal of Finance, 1971, pp 521-45.

Louderback, J G. 'Another approach to allocating joint costs: a comment', Accounting Review, 1976, pp 683-85.

Lurie, A G. Business segments: a guide for executives and accountants. New York: McGraw-Hill, 1979.

Mansell, C. 'Pentos Wombles on', Management Today, February 1975, pp 51-55, 110, 114.

Mansell, C. 'Croda's natural selection', Management Today, October 1975, pp 59-62, 64-65, 132.

Marris, R and Wood, A (eds). The corporate economy. London: Macmillan, 1971.

Mautz, R K. 'Identification of the conglomerate company', Financial Executive, July 1967, pp 18-20, 23-26.

Mautz, R K. 'Conglomerate reporting and data reliability', Financial Executive, September 1967, pp 25-26, 31, 33-35.

Mautz, R K. 'Bases for more detailed reporting by diversified companies', Financial Executive, November 1967, pp 52-54, 56-58, 60.

Mautz, R K. 'Financial reporting by conglomerate companies', Financial Executive, February 1968, pp 52-53, 55-56, 59-60, 63-65.

Mautz, R K. Financial reporting by diversified companies. New York: Financial Executives Research Foundation, 1968.

Mautz, R K and May, W G. 'The FTC line of business reporting programme', Financial Executive, January 1975, pp 14-24.

Mautz, R K and Skousen, K F. 'Common cost allocation in diversified companies', Financial Executive, June 1968, pp 15-17, 19-25.

McNamar, R T. 'FTC line of business reporting: fact and fiction', Financial Executive, August 1974, pp 20-27.

Mednick, R. 'Companies slice and serve up their financial results under FASB 14', Financial Executive, March 1979, pp 44-56.

Meyers, S L. 'A proposal for coping with the allocation problem', Journal of Accountancy, April 1976, pp 52-56.

Mirza, A M. 'External reporting by diversified Australian companies', Australian Accountant, 1971, pp 295-99.

Monopolies and Mergers Act 1965.

Moonitz, M. The basic postulates of accounting (Accounting Research Study Number 1). New York: American Institute of Certified Public Accountants, 1961.

'More annual confusion', Accountancy Age, 28 April 1978, p 13.

Moriarity, S. 'Another approach to allocating joint costs', Accounting Review, 1975, pp 791-95.

Moriarity, S. 'Another approach to allocating joint costs: a reply', Accounting Review, 1976, pp 686-87.

Morse, G. Company finance, takeovers and mergers. London: Sweet and Maxwell, 1979.

Needham, D. Economic analysis and industrial structure. London: Holt, Rinehart and Winston, 1970.

Newbould, G D. Management and merger activity. Liverpool: Guthstead, 1972.

Office of Fair Trading. Mergers: a guide to the procedure under the Fair Trading Act 1973. London: HMSO, 1978.

Organisation for European Co-operation and Development. International investment and multinational enterprises. Paris: Organisation for European Co-operation and Development, 1976.

Ortman, R F. 'The effects on investment analysis of alternative reporting procedure for diversified firms', Accounting Review, 1975, pp 298-304.

Penrose, E T. The theory of the growth of the firm. Oxford: Blackwell, 1972.

Prais, S J. The evolution of giant firms in Britain. Cambridge: Cambridge University Press, 1976.

Prevention of Fraud (Investments) Act 1958.

Rappaport, A, Firmin, P A and Zeff, S A (eds). Public reporting by conglomerates. Englewood Cliffs, New Jersey: Prentice-Hall, 1968.

Rappaport, A and Lerner, E M. A framework for financial reporting by diversified companies. New York: National Association of Accountants, 1969.

Rappaport, A and Lerner, E M. Segment reporting for managers and investors. New York: National Association of Accountants, 1972.

Rayburn, F R. 'The Cost Accounting Standards Board', The Accountant's Magazine, August 1975, pp 273-76.

Reid, S R. Mergers, managers and the economy. New York: McGraw-Hill, 1968.

Ridgway, V F. 'Dysfunctional consequences of performance measurement', Administrative Science Quarterly, 1956, pp 240-47.

Rosenfield, P. Review, Accounting Review, 1970, pp 825-26.

Rubner, A. The ensnared shareholder. Harmondsworth, Middlesex: Penguin, 1965.

Samuels, J (ed). Readings on mergers and takeovers. London: Paul Elek, 1972.

Schachner, L. 'Corporate diversification and financial reporting', Journal of Accountancy, April 1967, pp 43-50.

Schachner, L. 'On the apportionment of "central" expenses', The New York Certified Public Accountant, 1967, pp 679-87.

Schachner, L. 'Accountability under industrial diversification', Accounting Review, 1968, pp 303-11.

Schachner, L. 'Diversified operations - guidelines to accounting practice', The New York Certified Public Accountant, 1970, pp 617-30.

Schwartz, D E. 'Legal implications of product line reporting', Business Lawyer, 1968, pp 527-47.

Sharpe, W F. Portfolio theory and capital markets. New York: McGraw-Hill, 1970.

Skousen, K F. 'Standards for reporting by lines of business', Journal of Accountancy, February 1970, pp 39-46.

Skousen, K F. 'Chronicle of events surrounding the segment reporting issue', Journal of Accounting Research, 1970, pp 293-99.

Skousen, K F. 'A format for reporting segment profits', Management Accounting (USA), June 1971, pp 15-20.

Solomons, D. Divisional performance: measurement and control. Homewood, Illinois: Irwin, 1965.

Sommer, A A. 'Conglomerate disclosure: friend or foe?' Journal of Accountancy, May 1967, pp 61-67.

Sommer, A A. 'Conglomerate financial reporting', Business Lawyer, 1968, pp 521-26.

Sommer, A A. 'Product line reporting', Business Lawyer, 1970, pp 797-804.

Sprouse, R T. 'Diversified views about diversified companies', Journal of Accounting Research, 1969, pp 137-159.

Statement of Standard Accounting Practice Number 2: Disclosure of Accounting Policies. London: Institute of Chartered Accountants in England and Wales, 1972.

Statement of Standard Accounting Practice Number 14: Group Accounts. London: Institute of Chartered Accountants in England and Wales, 1978.

Sterling, R R. Theory of the measurement of enterprise income. Lawrence, Kansas: University Press of Kansas, 1970.

Stock Exchange. Admission of securities to listing. Revised edition; London: The Council of the Stock Exchange, 1973, updated from time to time.

Stock Exchange. Admission of securities to listing. Revised edition; London: The Council of the Stock Exchange, 1979, updated from time to time.

Tennant-Smith, J. Mathematics for the manager. London: Nelson, 1971.

The Bowater Corporation Limited. Annual report and accounts 1972.

'The pressure for more disclosure by brewers', Times, 22 July 1975, p 19.

Thomas, A L. The allocation problem in financial accounting theory (Studies in Accounting Research Number 3). Evanston, Illinois: American Accounting Association, 1969.

Thomas, A L. 'Transfer prices of the multinational firm: when will they be arbitrary?' Abacus, 1971, pp 40-53.

Thomas, A L. 'Useful arbitrary allocations (with a comment on the neutrality of financial accounting reports)', Accounting Review, 1971, pp 472-79.

Thomas, A L. Financial accounting: the main ideas. Belmont, California: Wadsworth, 1972.

Thomas, A L. The allocation problem: part two (Studies in Accounting Research Number 9). Sarasota, Florida: American Accounting Association, 1974.

Thomas, A L. 'The allocation fallacy and financial analysis', Financial Analysts Journal, September/October 1975, pp 37-41, 68.

Thomas, A L. 'The FASB and the allocation fallacy', Journal of Accountancy, November 1975, pp 65-68.

Thomas, A L. 'Arbitrary and incorrigible allocations: a comment', Accounting Review, 1978, pp 263-69.

Tobias, A. The funny money game. London: Michael Joseph, 1972.

Tomkins, C. Financial planning in divisionalised companies. London: Accountancy Age Books, 1973.

United Nations. International standards of accounting and reporting for transnational corporations (Report of the Group of Experts on International Standards of Accounting and Reporting to the United Nations Economic and Social Council Commission on Transnational Corporations). New York: United Nations, 1977.

Van Dam, C (ed). Trends in managerial and financial accounting, I. Leiden: Martinus Nijhoff, 1978.

Walker, R G. 'Disclosure by diversified companies', Abacus, 1968, pp 27-38.

Webb, E J, Campbell, D T, Schwartz, R D and Sechrest, L. Unobtrusive measures: nonreactive research in social sciences. Chicago: Rand McNally, 1966.

Weston, J F and Mansinghka, S K. 'Tests of the efficiency performance of conglomerate firms', Journal of Finance, 1971, pp 919-36.

Wilkins, R M. Group accounts. London: Institute of Chartered Accountants in England and Wales, 1975.

Wright, H W and Bedingfield, J P. 'Benefit as a criterion for indirect cost allocation', The Federal Accountant, September 1973, pp 67-76.

Yamey, B S (ed). Economics of industrial structure. Harmondsworth, Middlesex: Penguin, 1973.

Yarian, N R. 'Segmentation for reporting purposes', Management Accounting (USA), April 1975, pp 16-20, 23.

Zeff, S A. 'The rise of "economic consequences"', Journal of Accountancy, December 1978, pp 56-63.