

DECENTRALISED ORGANISATIONS AND SOME  
ACCOUNTING PROBLEMS OF INTERNAL TRANSFERS

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by

McNally, G.M.

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## INTRODUCTION

The overall objective of this thesis is to evaluate some of the accounting problems which may arise as a consequence of internal transfers between the segments of large decentralised organisations. Recent decades have seen a continuing increase in the size of business units, creating new problems in the management of these units. In particular, an extension has occurred in the degree of autonomy for decision-making which has been granted to the managers of individual divisions or segments of the firm. As a consequence, the problems of planning the operations of these semi-autonomous divisions and evaluating the performance of the division managers have become more complex, with a need to examine the theoretical and empirical problems which may have arisen. One specific problem existing in many large business organisations, and which is of particular importance in those firms having a decentralised system of decision-making, is the need to price internal transfers. To ensure that the planning and evaluation of the divisions is undertaken in the desired manner, a need has arisen to establish transfer prices which will contribute effectively to the purposes for which they are employed. Without consideration being given to the problems of pricing internal transfers, many of the benefits which are likely to occur, as a result of establishing semi-autonomous units within the firm, may be nullified.

This study will not examine all of the aspects of accounting for internal transfers, but will be limited to a consideration of the management and management accounting aspects, with reference being made to financial accounting aspects only when they may have an influence on the managerial issues of transfer pricing.

Both theoretical and empirical features of the area under study are considered. The theoretical features are examined and criticised in an attempt to establish the place of internal transfers in decentralised organisations. Empirical data, from selected New Zealand business firms, is

analysed in an effort to determine the current state of practice, at least within the sample of companies surveyed, and to consider how closely these practices resemble what is theoretically desirable. The application of transfer pricing would, from the survey, appear to be limited in New Zealand business units, thus reducing the size of the sample and limiting any attempts to analyse significant features. However, this is in no way a reflection on the co-operation given by the companies included in the survey, for all of these firms gave considerable assistance in completing the written questionnaire and by making executives available for interviews. Without this co-operation the empirical section of this thesis would not have been possible, and thus the author is indebted to the management of all the participating companies.

In Part I of the thesis some of the characteristics of divisionalised and decentralised organisations are outlined. Particular attention is given to the reasons for decentralising the authority to make decisions and the extent of decentralised control in some New Zealand business firms. The methods by which divisions may be evaluated are outlined, whilst the concept of profit evaluation is examined in detail. This discussion provides an important background and establishes the framework within which the issues of internal transfers, as one problem arising as a consequence of decentralisation and the establishment of divisions, may be examined.

Transfer prices are discussed in depth in Part II. Chapter III reviews the historical development of transfer pricing methods and indicates the changes in acceptable practice which occurred in the early decades of this century. Chapter IV discusses the reasons for establishing transfer prices and outlines the range of prices which are available. Empirical evidence concerning the extent of internal transfers in New Zealand, the purposes for which they are required and the use being made of the available prices is examined. The remaining two chapters expand Chapter IV by giving detailed consideration to the role of different prices for assisting the evaluation of the performance of division managers and as an aid to decision-

making. These chapters examine the issues at a theoretical level, whilst giving attention to the prevailing empirical situation in New Zealand.

The final section, Part III, attempts to take a broader view of the question of internal prices by considering the concept of a management control system. Prices may have an important role not only in market economies, but in those economies which are substantially controlled by a central group of managers. Therefore, within the context of business organisations some of the conceptual issues of using internal prices as a system of management control are examined. It is essential if large organisations are to be a success, that the system of management control adopted is the one which contributes most efficiently and effectively in a particular firm towards achieving the established objectives.



PART I

ASPECTS OF DECENTRALISED ORGANISATIONS

CHAPTER I  
THE ESTABLISHMENT OF DIVISIONS

1.1 The Problem of Definition:

Establishing the meaning of the phrase "a division" is an important prerequisite to any discussion concerning the concept of divisional units generally or, as in this particular chapter, a discussion of some specific aspects of establishing divisions in business organisations.

Some authors are precise in their understanding of what constitutes a division. For example, Solomons<sup>1</sup> suggests that a division is:

"a company unit headed by a man fully responsible for the profitability of its operations, including planning, production, financial and accounting activities, and who usually has his own sales force. The division may be a unit of the parent company or it may be a wholly owned subsidiary".

Employing this rather narrow definition would limit severely any discussion of divisional structures, particularly when empirical data, drawn from the New Zealand business environment, is considered. More satisfactory is the suggestion of Shillinglaw<sup>2</sup> who, in attempting to develop a theory of divisional income measurement, outlines a set of postulates, of which two may be considered as a definition of a division. He states:

"Postulate 2 : the division is an organisation segment of the firm, operated by division management as a semi-independent company, its independence subject only to the restrictions imposed by general company policies.

Postulate 5 : division management has at least partial control over some but not all of the elements that determine the amount of income generated by the division's operations."

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<sup>1</sup> Solomons, D., 'Divisional Performance : Measurement and Control' (New York : Financial Executives Research Foundation, 1965) page 3. Quoted from 'Divisional Financial Executives' (New York : National Industrial Conference Board, 1961).

<sup>2</sup> Shillinglaw, G., 'Toward a Theory of Divisional Income Measurement', The Accounting Review (April 1962) page 209.

At least three attributes relevant to this discussion may be isolated from the two definitions just presented. These are that divisions are separate or identifiable organisation units, they have a considerable degree of autonomy or control over their operations, and the results of these segments may often be measurable in terms of income or profit. From these attributes an appropriate definition of a division is: a section or segment of an organisation substantially controlled by its own management, so that its performance is able to be measured in terms appropriate to the nature of the firm, the division and the extent to which control is delegated to its management. Such a definition would allow sections of an organisation to be considered as divisions even when perhaps the method of segmentation<sup>3</sup> or the attitudes of management towards extending control prevent a meaningful measure of performance in terms of income.

It is important to recognise that the concept of divisionalisation is an outgrowth of the process of decentralised<sup>4</sup> decision-making, and could well be considered as a special case of decentralisation.<sup>5</sup> For any business firm, or indeed organisation in a more general sense, which decentralises the decision-making process is doing no more than creating "decision units", each of which may have a wide range of possible degrees of control or autonomy over many different variables, each "decision unit" having responsibility for the control of the variables assigned to it. As the range of variables over which control has been delegated is extended these decision units may appear as semi-autonomous segments of the firm or,

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<sup>3</sup>The most common example of this occurs in functionally divided organisations. For a further examination of this point, see pages 13-17 *infra*.

<sup>4</sup>Decentralisation as used in this context is the assigning of the responsibility for making a particular set of decisions to the lowest level of the hierarchy where both the needed skills or competence and the required information may be reasonably brought together.

<sup>5</sup>The possibility does exist of having an organisation structure which comprises several divisions, or identifiable units, but does not involve the delegation of the decision-making authority to the personnel of each unit. Such an approach would not enable the advantages usually associated with divisionalised organisations to be fully utilised.

in other words, as divisions.<sup>6</sup>

In a survey<sup>7</sup> of companies in New Zealand, it was found that a considerable range of views was expressed by executives regarding their understanding of the term "a division", and to some extent this reflects the rather confused state of management literature on this subject. Some firms viewed divisions as being equivalent to individual cost centres within a single factory, the majority were of the nature indicated by Shillinglaw with a degree of control over many of the factors influencing income, few were consistent with Solomons' definition, whilst one company in particular considered its divisions as something more embracing than Solomons' concept.

## 1.2 Reasons for Decentralised Decision-making:

As the process of decentralisation would appear to be a preliminary step towards the establishment of divisions in many business firms it is important to understand just why this delegation of decision-making occurs.

Recent decades, and more particularly recent years, have witnessed a continuing growth in the size of business units both in New Zealand and overseas. This growth,<sup>8</sup> which is illustrated in Tables Ia, Ib, IIa and IIb below, has resulted in more complex business firms and it is this complexity in the production, distribution or administration phases of operations which has either directly or indirectly accounted for the delegation of decision-making authority to executives at various hierarchical levels.

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<sup>6</sup>With the definition suggested above it is not possible, nor is it considered desirable, to establish precisely the extent of control that must be extended over a range of variables before the term "division" may be accepted as valid.

<sup>7</sup>Appendices I, II and III, pages 149-162 infra, discuss how the survey was undertaken and include copies of the questionnaires used.

<sup>8</sup>It is recognised that the two measures of growth used may not be completely adequate measures and should ideally be complemented by other financial and physical indices.

TABLE Ia : Distribution of New Zealand companies by paid up capital for 1954-5 and 1964-5.<sup>9</sup>

Paid up Capital \$	1954-5		1964-5	
	Number of Companies	% of Total	Number of Companies	% of Total
0- 399,999	19,278	98.856	44,130	98.953
400,000- 799,999	115	0.589	212	0.475
800,000-1,199,999	46	0.236	73	0.164
1,200,000-1,599,999	21	0.107	50	0.112
1,600,000-1,999,999	9	0.046	37	0.083
2,000,000 →	32	0.164	95	0.213

TABLE Ib : Distribution of New Zealand companies by income for 1954-5 and 1964-5.<sup>10</sup>

Income \$	1954-5		1964-5	
	Number of Companies	% of Total	Number of Companies	% of Total
0- 99,999	19,278	98.392	35,327	98.218
100,000-399,999	247	1.261	482	1.340
400,000-799,999	41	0.210	83	0.231
800,000-999,999	9	0.046	16	0.044
1,000,000 →	18	0.092	60	0.167

TABLE IIa : Distribution of 14 selected<sup>11</sup> New Zealand companies by paid up capital for 1955 and 1965.

Paid up Capital \$	1955	1965
	Number of Companies	Number of Companies
0- 399,999	1	-
400,000- 799,999	3	1
800,000-1,199,999	4	1
1,200,000-1,599,999	1	-
1,600,000-1,999,999	2	1
2,000,000 →	3	11

<sup>9</sup> Department of Statistics, 'New Zealand Official Yearbook' (Wellington, R. E. Owen, Government Printer, 1956, 1966).

<sup>10</sup> Ibid.

<sup>11</sup> These companies are selected from the sample used in the survey. However, as the information was obtained from 'The New Zealand Stock Exchange Gazette' only those companies which were listed on the Stock Exchange in 1955 and 1965 have been included.

Income (after tax) \$	1955 Number of Companies	1965 Number of Companies
0- 99, 999	6	1
100, 000-399, 999	5	4
400, 000-799, 999	2	5
800, 000-999, 999	1	-
1, 000, 000 →	-	4

Several factors may be responsible for decentralising or delegating the authority for decision-making and these include:

- (i) the nature of the decision being considered,
- (ii) the size of the enterprise,
- (iii) the philosophy of senior management personnel,
- (iv) historical factors in the acquisition or growth of any segment of the firm,
- (v) the availability of suitable managerial talent.

For any particular type of decision there are a number of features which may influence the choice to decentralise the responsibility for making that decision. Two such factors could be the potential cost or revenue which may be attributed, either directly or indirectly, to the decision and the desire for a uniform policy covering the whole firm. Whenever the impact of a decision, when measured in cost or revenue terms, is likely to be large it is probable that a tendency towards centralised decision-making will occur. For example, capital expenditure<sup>12</sup> and pricing decisions would tend to be centralised, whilst those concerning the source and quantity of raw material purchases would tend to be more decentralised. Likewise, the need for a uniform policy with regard to pricing, the granting of credit, or perhaps the control of quality will result in more centralised decision-

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<sup>12</sup>This is illustrated in the attitudes of the companies in the survey towards delegating the authority for this decision, see pages 31-32 infra.

making.<sup>13</sup>

The increasing size of business units as shown by Tables Ia, Ib, IIa and IIb, has often been associated with an expansion by individual firms into new industries in addition to horizontal and vertical integration in existing areas of activity. Expansion into entirely new industries has resulted in firms requiring managerial staff with a new set of skills. The lack of specialised experience which existing management has in these new industries has necessitated the acceptance, at least initially, of a decentralised organisation structure. Similarly, but perhaps less evident in many firms, the horizontal or vertical integration within an existing industry, requires a wider range of managerial abilities and thus tends to induce a decentralised structure.

Problems other than those imposed by limited management skills will arise as a result of an expansion in the size of business firms and may also hasten decentralisation. One of the more important, although often neglected or not explicitly recognised, is that of information or communication costs. As a firm increases in size and thus in complexity, the number of decisions required to be made increases, possibly in a geometric manner. Thus a firm with several levels in the hierarchy often finds that the decision-making process is slowed. To avoid this situation, which would usually result in additional costs because of delayed decisions, it is necessary to increase the number of points in the organisation where decisions may be made, and to increase the range of decisions able to be made at each decision point.

This impact of an increase in the size or complexity of a firm on the communication process, is recognised by Scott<sup>14</sup> who suggests "the larger

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<sup>13</sup>In any firm, the availability or otherwise of personnel who are sufficiently experienced to make a wide range of decisions, may influence the importance of the two features just outlined as partial determinants of the extent to which decentralisation will occur.

<sup>14</sup>Scott, W. G., 'Communication and Centralisation of Organisations', The Journal of Communication (March 1963) pages 3-11.

the organisation the greater is the strain that is placed on its communication network".<sup>15</sup> As any organisation increases in size it would be expected that a greater need for information passing through the channels of communication will exist. "But the parallel growth of an organisation and its need for information do not exist in a one to one ratio."<sup>16</sup> The presence of information tends to intensify the use made of the information in a way closely akin to the action of a chemical catalyst. This would lead to the conclusion that the capacity of the communication channels existing in a centralised organisation may be outstripped by the demands for information to pass through such channels. To reduce this strain decentralisation must occur.

Increases in the size of business units may lead to production facilities and/or markets for the firm's output being geographically dispersed or isolated. Such separation may require decentralised decision-making to ensure that the features of the local environment are considered and to enable decisions concerning segments of the firm to be made and implemented within an acceptable period of time.

Although the factors which have been discussed may justify a considerable degree of decentralisation in a firm, the attitude or philosophy of senior management towards the delegation of decision-making authority, will be an important influence on the extent of delegated authority within a particular firm. For instance, firms which have grown internally, often with a family business as their origin, tend to retain a more centralised structure,<sup>17</sup> whilst those firms which have grown substantially by merger or take-over often have a decentralised structure.<sup>18</sup> However, the

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<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

<sup>17</sup> Because of the confidential nature of the survey undertaken, reference to New Zealand companies has been purposely excluded. However, American examples often cited in this context are the Ford Motor Corporation, particularly under its founder, and in more recent times the International Harvester Company.

<sup>18</sup> In the U. S. A. the best known examples include General Motors and Sears Roebuck.



attitudes of existing or recent management in a company, despite the nature of the company's background, will be an important influence in determining the degree of decentralisation.

### 1.3 Reasons for Establishing Divisions:

The observations in the previous section indicated some of the reasons why business firms may delegate the authority to make specific decisions. However, no consideration was given to structuring the decentralised authority within the boundaries of a group of divisions. Although the observations which have been made could provide sufficient justification for establishing semi-autonomous units, other factors may influence the decision to rationalise the system of decentralised decision-making into a group of semi-autonomous divisions.<sup>19</sup>

A programme of diversification in a firm may lead to the recognition that not only are managerial talents likely to be used differently in the operation of particular segments, but that these segments may need to be organised differently. Creating separate units and delegating a degree of control to the managers of each unit, should contribute towards more effective operation.

Establishing and operating a system of divisions within a firm has an important influence on the quality of senior management over a long period of time. Many of the problems which exist in a large organisation will also occur on a smaller scale in the individual divisions, therefore enabling prospective senior executives to gain the experience of solving such problems. As one author concludes:

"A great improvement . . . in any firm (will occur) when the creative talents of responsible individuals are encouraged to develop in a climate of individual responsibility, authority and dignity - a climate

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<sup>19</sup> Any firm may develop a division not as a result of having already delegated decision-making authority but because a new area of activity has been undertaken. Thus the creation of a division and the delegation of decision-making to that area of activity may be simultaneous events.

made possible by the decentralisation of decision-making."<sup>20</sup>

As the management of firms, which are engaged in a diverse group of activities, will be interested in the performance of each activity, establishing each of the activities as a semi-autonomous unit, distinct from the other aspects of the firm's operations, should enable the performance to be more easily measured and the results to be of greater significance. In addition the existence of divisions may enable one of the commonly accepted methods of evaluation, such as sales, costs or a profit concept, to be employed.

The empirical survey<sup>21</sup> requested the participating companies to indicate the reasons why divisions have been established. Table III below indicates the replies given to this question by the 28 respondents and also the relative importance attached to each of the reasons whenever more than one reason influenced the decision to create identifiable units or divisions.

Reasons for Establishing Divisions	Ranking of importance			
	1st	2nd	3rd	4th
Scale of operations	10	5	1	1
Close control over costs	6	5	4	1
Assess profitable units	5	4	-	-
Geographical isolation	3	3	1	-
Encourage and improve managers	2	3	7	1
Improve the firm's performance	1	3	-	1
As the result of a merger	1	2	-	-

The most important reason indicated by the responding companies is the scale of the firm's or the individual division's operations with ten firms considering this as being of prime importance and five as of second importance. Large scale operations could become complex and unmanageable under a single group of managers and thus the need arises to establish

<sup>20</sup> Burlingame, J. F., 'Information Technology and Decentralisation', Harvard Business Review (November-December 1961) page 122.

<sup>21</sup> See Appendix III, page 159 infra.

separate operating and managerial groups for each segment of the firm's activities. Closer control over costs was suggested as the next most important reason with six, five and four companies ranking this of first, second and third importance respectively. This reason is probably closely associated with the first reason discussed, as managers for individual sections of the firm will enable more direct control over operations, and the ability to isolate more clearly the cost patterns of different segments will be enhanced when identifiable units exist. The reason which ranks next in significance is the ability to assess the most profitable aspects of the firm's activity, five companies considering it to be of greatest importance and four of secondary importance. It is somewhat surprising that comparatively few firms placed emphasis on this reason and it would appear that assessing such profitability is considered of importance only after divisions have been established and are operating. Equally surprising is the lack of importance attached to establishing divisions as a means of encouraging or developing managers within the firm, for only two companies considered this of first importance, three of second importance, and seven of third importance. This would probably be a consequence of the dominating importance of the other reasons considered and the somewhat small and stable group of central management personnel. The final reason of significance, the geographical isolation of operating segments, was considered to be of most importance by three firms and of second importance by the same number. Such a reason for establishing divisions would enable sections of the firm to operate more efficiently in local conditions and enable decisions to be made and implemented within a relevant time period.

#### 1.4 Methods of Identifying Divisions:

Having considered some aspects of decentralisation it is necessary to outline, as a preliminary to later discussion of particular transfer prices, the approach business firms take to identifying divisions. <sup>22</sup>

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<sup>22</sup> It is not intended to discuss the merits of the available methods of identifying divisions, but rather to consider the importance of each method in the companies surveyed.

The most commonly adopted methods of identifying divisions include:

- (i) functional arrangement,
- (ii) geographic regions,
- (iii) product lines,
- (iv) process centres,
- (v) acquired companies.

Such a classification does not enable each element to be considered as mutually exclusive. For any one division may be included in more than one category so that a particular division could be considered as any one of an acquired company, a product line, or perhaps a geographic region. This type of problem reduces the value of a single index classification as used in Table IV below.

One of the questions<sup>23</sup> asked in the survey of companies who were using transfer pricing, was concerned with the ranking of the importance of each method of establishing divisions employed by the particular company. The results of this question are presented in Table IV.<sup>24</sup>

From Table IV it is apparent that, in the survey undertaken, establishing divisions by product line is the most frequently used method. This result could perhaps have been anticipated as the sample, as indicated in Tables Va and Vb below, included many of the largest business units in New Zealand. Often large firms, although predominantly operating in one or

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<sup>23</sup> Refer to Appendix III page 153 infra.

<sup>24</sup> Although the question asked companies to rank the importance of each method employed for identifying divisions, the results shown in Table IV are not weighted. Any attempt to apply a weighting to the information received from the companies would involve problems such as determining a system of weights which does not distort the meaning of the data. Furthermore, the existence of several methods of establishing divisions within a firm means that the lower ranked methods would receive a smaller weighting in this firm than in a firm with only two methods of identifying divisions. Thus the number of methods used by a firm would influence the weighting attached to a particular form of divisionalising, rather than the importance of each method to a firm determining the weighting. For these reasons only the frequency with which each method was cited has been used to construct the table.

TABLE IV : The frequency each method of establishing divisions is used - analysed by industry types.

Method of Establishing Divisions	Industry Type								TOTAL
	1	2	3	4	5	6	7	8	
Product lines	3	2	2	2	6	2	3	4	24
Functional areas	-	1	2	2	6	1	2	1	15
Process centres	1	1	1	2	2	1	-	-	8
Geographic regions	4	-	-	-	1	-	5	-	10
Companies acquired	3	2	2	-	2	-	2	2	13

KEY TO INDUSTRY TYPE

- |                           |                                     |
|---------------------------|-------------------------------------|
| 1. Foodstuffs, Chemicals. | 5. Consumer Goods, Home Appliances. |
| 2. Textiles, Clothing.    | 6. Forestry, Pulp and Paper.        |
| 3. Engineering.           | 7. Retail, Finance.                 |
| 4. Vehicle Manufacture.   | 8. Printing, Packaging.             |

TABLE Va : Distribution of the size of companies included in the survey, <sup>25</sup> measured by total assets and shareholders' funds.

\$(000's)	Total Assets	Shareholders' Funds
<1, 000	-	4
1, 000 - 5, 999	7	12
6, 000 - 10, 999	8	6
11, 000 - 20, 999	8	5
21, 000 - 40, 999	4	1
41, 000 →	<u>2</u>	<u>1</u>
Totals:	29	29

TABLE Vb : Distribution of the size of companies included in the survey, measured by number of employees.

Number of Employees	Observations
0 - 500	7
501 - 1, 000	10
1, 001 - 2, 000	7
2, 001 - 3, 000	4
3, 001 →	<u>4</u>
Total:	32

<sup>25</sup> Three of the companies responding to the questionnaire did not indicate their size in total assets and shareholders' funds.

two industries, are of a diversified character, perhaps within these one or two main industry groups, or over a wider range of industries. The main industry groups using a product line basis were: foodstuffs-chemicals, consumer goods, and printing-packaging. Although it is difficult to clearly state a reason for this, it does seem likely that either at the productive, or distributive, phases of operations the output will consist of several sufficiently distinct products to require separate processing methods and equipment, or different marketing methods and perhaps types of customers.

Those companies using functional areas as the important basis of divisionalising came principally from the consumer goods, vehicle manufacture and retail groups. This is due, at least in the first two instances, to the nature of the industries in New Zealand, namely a wide range of products using the same basic processes. In addition the small scale of operations in New Zealand would suggest that manufacturing may be completed most economically within one factory. Retail organisations are usually characterised by a clear distinction between the production of output, if this occurs, and the selling phase thus suggesting a functional arrangement of divisions.

The lack of emphasis on process centres as a basis of establishing divisions would have been more accentuated, but for the confusion existing in the minds of some executives as to the meaning of a division. With the consumer goods, vehicle manufacturing, and perhaps engineering groups, the cost centres existing within the production or assembly processes were interpreted by responding companies as divisions. If the data had been corrected for this error a slightly higher weighting may have existed in the product and functional methods of classifying divisions.

Using geographic regions to identify divisions was confined in importance to the foodstuffs-chemicals and the retail-finance groups. In the case of the retail-finance group this is caused by the large number of outlets, often with each of these being considered as separate divisions. Chemicals-foodstuffs companies are generally characterised by the need to

localise production activities so as to take advantage of the sources of inputs or to minimise the high transportation costs likely to be incurred with production which is dominated by large volumes of input and output.

The concept of "companies acquired" to delineate divisions is really a conglomerate title which could refer to any of the other methods already discussed.<sup>26</sup> With this in mind, the answers presented in this category should be interpreted as belonging to the four categories already discussed. Such an adjustment may result in the significance of each method for establishing divisions being more clearly identifiable for a particular industry group.<sup>27</sup>

#### 1.5 Summary:

In this chapter some aspects of developing a divisionalised organisation structure have been considered. The reasons why business firms develop semi-autonomous divisions and the significance of each method of identifying divisions are both important when discussing the approaches which may be taken when reporting the results of divisions. Organising a company on a functional or product line basis may influence the extent to which control is delegated and in turn the applicability of either a cost or profit concept as a measure of divisional results.

The existence of a particular type of organisation structure, and the degree of control vested in a division manager, may influence the policy the company adopts with regard to internal transfers. Pricing these transfers may well be influenced by a basic characteristic of a company, such as the structure and identification of divisions.

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<sup>26</sup> Some firms may establish divisions as separate companies as a method of giving prestige to the division managers.

<sup>27</sup> This conclusion is drawn from discussions held with most of the companies who responded to the survey. The original data collected has not been adjusted for the above conclusion as the data may indicate the relative importance of take-overs in various industry groups, a factor which could influence the form of transfer price used.

## CHAPTER II

### MEASURING THE FINANCIAL RESULTS OF DIVISIONS

#### 2.1 Measuring Performance in Divisions:

In Chapter I the concept of a division was examined together with an outline of how divisions may be established. It was suggested that divisions are segments of an organisation, granted a degree of authority or control over a certain set of variables so that a specified range of decisions may be made. Given this definition it would seem necessary that the results of each division are accumulated and presented to both divisions and central management on a regular basis. Two reasons exist for this need to measure the results of divisions and these are:

- (i) to evaluate the performance of the division,<sup>1</sup>
- (ii) to guide in the making of decisions which will contribute to the objectives of the firm and the division.

The measuring of how a division has performed is often interpreted as a problem of assessing the results of any division in terms of profit. It must however be realised that a profit concept will in many situations not reflect the authority extended to a particular manager, nor may it be an appropriate device with which to assess the use which has been made of a division's resources. For in many business firms the extent to which control is delegated to the managers of divisions may be limited to a few variables.

This chapter will examine two of the major methods of evaluating the

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<sup>1</sup> There are two aspects to this reason, they are: (a) to evaluate the performance of individual division managers, giving consideration to the extent of control that any particular manager has, and (b) to measure how effectively the resources or assets of any division have been used. Many firms consider these two aspects to be synonymous. However, the question of whether a group of resources, in the form of a division, are "profitable" as an economic unit, is distinct from considering whether a division manager, utilising a given set of resources and subject to a specified degree of control over a finite period of time, has operated effectively.



performance of divisions<sup>2</sup> and will consider some of the problems likely to arise when utilising these methods. For it will be important in the later discussion on the concept of transfer prices to relate the price base to the method of performance evaluation being used.

## 2.2 Cost as a Basis of Divisional Reporting:

Cost based measurements may be the most suitable means of assessing performance of divisions in two circumstances which may be related. The first is where the control vested in a division manager is insufficient to justify using a profit concept, and the second is where the method by which divisions have been delineated prevents the effective use of a profit concept.

The extent to which control is delegated to a division manager may be influenced by:

- (i) the size of the overall firm or a particular division,
- (ii) the degree of product diversification existing in the firm,
- (iii) the availability of suitable management personnel,
- (iv) the degree of dependence for physical, financial or human resources which exists amongst divisions. For example, the joint use of productive or service facilities, or the existence of interdivisional transfers may limit the extent control is vested in division managers.
- (v) The philosophy of senior management towards delegation of authority.

Using a functional or process centre classification for divisions would suggest a cost based method of evaluation. This is primarily a consequence of recognising that any manager of a functionally established division is only able to control one phase of the acquisition-production-distribution network

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<sup>2</sup> Although the performance of divisions may be measured in both financial terms such as profit, sales or costs, and in non-financial terms such as the quantity of output, new product innovation or employee turnover, the discussion in this chapter will be restricted to financial measures of performance. It is the financial measures which will have an important influence on the issues of transfer pricing.

of decisions, which will result in the earning of income. In these circumstances some firms attempt to impute a profit to each division. However, when such a system of divisions does exist, this is an arbitrary profit allocation, for even if the production manager is charged with the inputs he uses, and is credited with the output "priced" at a level greater than the costs incurred in producing the output, the individual divisional "profit" figure has little or no meaning. Similarly, if the distribution manager is charged<sup>3</sup> with the finished units he receives, at the price they were credited to the production manager, and is in turn credited with the selling price existing for these units in the market, what meaning does the "profit" figure have and of what value is it in fulfilling the objectives of divisional reporting? As Shillinglaw<sup>4</sup> states,

"Division management should be charged for the use of all those resources over which it has control and any variances between the objective ... and that achieved ... should result from factors that are at least partially subject to division management's control."

It should not be considered that the cost basis of evaluation is suitable only for divisions established on a functional or process basis. Divisions based on product lines or geographic areas may be operated so that evaluation on a cost basis may best be used. However, with these divisions it is, at least conceptually and often practically, possible to consider them in terms of profits. The empirical evidence collected in the survey revealed that only two companies out of sixteen who were organised primarily on a product line or geographic region basis used cost as the method of evaluating the results of divisions, whilst of the seven organised on a functional basis, six<sup>5</sup> used a cost basis of evaluation.<sup>6</sup>

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<sup>3</sup>The manager would also be charged with the costs incurred in his own division.

<sup>4</sup>Shillinglaw, G., 'Toward a Theory of Divisional Income Measurement', op. cit., pages 213-214.

<sup>5</sup>The one company using a profit method of evaluation was organised so that the output from the production division could be transferred to the retail division for selling or be sold directly to wholesalers who were external to the firm.

<sup>6</sup>As this information was obtained from interviews with companies it does not include responses from all those firms who replied to the questionnaire.

Cost based systems of divisional reporting must be reviewed by considering the purposes for which divisional results are accumulated. It has already been suggested that for the purpose of assessing the performance of a particular manager, a cost based system may be the most appropriate in those situations where either the extent of delegated control is limited, or the method of divisionalising prevents division managers having effective control over profits. Such situations would require some base such as cost standards or budgets against which the manager's actual performance may be measured, remembering that the cost elements must be limited to those over which a particular manager is able to exert a degree of control.

The second aspect of performance evaluation, that of measuring how effectively the assets allocated to a division have been used, is more difficult to accomplish. One of the difficulties is to establish the meaning of "effectively used". To many firms this would require the results of individual divisions to be considered in comparison with the predominant objective of the firm, such as to maintain or increase profit<sup>7</sup> over a specified period of time. If such an objective does exist, the use of cost reporting for divisions will not enable the contribution of each division towards the objective to be directly established. Rather, the profit level must be determined for the firm as a single unit. Developing the profit figure will require each division to establish budgets and standards for the level of costs it would expect to incur, assuming the adoption of a production programme which will yield the estimated profit level. The measure of the effective use being made of a division's resources would then become a comparison between the cost levels incurred, and those projected in the budgets or standards. For, if a particular division achieves or improves its level of costs, relative to the budgets or standards, then it is contributing to the final profit of the firm in a manner which is consistent with its planned

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<sup>7</sup> Although the survey was not directed towards the objectives of the firms surveyed, the fact that most of the companies with divisions organised on the basis of product lines or geographical areas used a profit concept to assess divisional performance, indicates its significance.

contribution<sup>8</sup> at the time of establishing the profit target.

As a guide to decision-making the value of reports based on costs is determined by one or both of: the nature of the decision being considered and the objectives of the division and the firm. For some decisions, such as capital expenditure evaluation, any division acting in isolation and which either is part of a functionally organised group, or relies on cost reports alone, would possess insufficient information to enable the decision to be made in a valid manner. If the divisions and the firm have as an objective some concept of holding or minimising costs, whether this is explicitly stated or not, then the construction of cost reports will enable the particular division to operate and to make decisions in a manner which is consistent with the objective. Should the firm adopt a concept of profit maximisation as its primary objective, then the use of cost reports at a divisional level may result in an incorrect assessment of a division's performance, or to divisions making decisions which conflict with the objectives of the firm.<sup>9</sup>

### 2.3 Profit as a Basis of Divisional Reporting:

In earlier sections it has been shown that distinguishing divisions by product lines and geographic regions is, at least in the survey undertaken, more common than functionally arranged divisions. Furthermore, it was suggested that the use of a profit concept to measure the results of these divisions was appropriate<sup>10</sup> for at least conceptually the manager is able to exert some control over each stage of the profit earning process.

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<sup>8</sup>This assumes that any other criteria such as quality control standards are not breached as this may influence the contribution of any division to the planned level of profit.

<sup>9</sup>It is recognised that merely establishing compatible objectives such as cost minimisation, for both divisions and the whole firm, will not necessarily lead to compatible actions. However, it is likely that greater compatibility will occur than in situations where different and even possibly conflicting objectives exist.

<sup>10</sup>Only one company with divisions organised on this basis did not use a profit concept.

Business firms should only adopt a concept of profit reporting for divisions if such reports will enable the purposes of accumulating divisional information to be fulfilled more completely than if any other system of divisional reporting was adopted. In turn this implies that the principal objective of both divisions and the overall firm is some concept of profit.

If the managers of divisions have their performance assessed on the basis of a profit concept, then it must be assumed that the control<sup>11</sup> extended to these managers is sufficient to justify the use of such a concept. Perhaps the most important feature to remember when considering the use of a profit concept is that it only measures performance in financial terms and is in no way a complete measure of financial performance.

The consideration of how effectively a division's resources have been employed may be completed by using a profit concept in those circumstances where the divisions may be considered as autonomous economic units. Conceptually, this would occur when each division is completely independent in all aspects of its operations, for this would limit any restrictions on the results achieved by a division to those arising from the external environment. This implies that each division would support its own research, maintenance, accounting and legal service facilities. Such a situation would, in almost all circumstances, be unacceptable from the viewpoint of the whole firm, for not only does it involve additional costs, and create inefficiencies, it considers each division as nothing more than an investment of the parent company and not as a part of an integrated unit.

As a step towards integrating the segments of the firm, centralisation of some or all of the service facilities should not significantly reduce the autonomy of individual divisions, for although certain delays may occur in the time and the extent of the available services, such service facilities are developed to serve the needs of the organisation. Obvious benefits will accrue to the whole firm as a result of centralising service facilities, whilst

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<sup>11</sup>The extent to which control is granted to division managers whose firms were included in the survey is discussed later in this chapter.

the ability to measure the use which has been made of divisional resources is not unduly diminished. For if each division is charged for the use it makes of the service facilities then it still has the characteristics of an independent economic unit.

Many firms may restrict the independence of divisions by making decisions such as capital expenditure allocations, output decisions and pricing decisions on a centralised basis. Furthermore, some of the productive facilities may be used jointly. However, actions such as these do not of themselves prevent the use of "profit" as a measure of the worth of a division's resources. It is only when central management makes decisions which are inequitable amongst divisions, and therefore prevents particular divisions from revealing their true potential worth or profitability, by distorting the results, that the value of the measure is debased.

Perhaps the most apparent situation where a profit concept may not validly be used to assess the "worth" of a particular division is when the firm is organised so that one or more divisions are not in direct contact with the external market. As a consequence it is not possible to attach or associate the earning of revenue with these divisions.<sup>12</sup> This would occur primarily in functionally organised firms. However, the existence of divisions producing products as the first stage of a sequential processing operation may also prevent the use of a profit measure. Such divisions cannot be considered as identifiable and separate economic units but rather as part of a larger economic sub-unit of the firm, or as part of a single economic unit, the firm.

Using profit reports for making decisions will be a successful aid to division managers if the primary objective is related to profit, and the divisions are organised so that they have a responsibility for many of the variables leading to a profit. If these two criteria are met it is likely that,

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<sup>12</sup>In Finney, F. D., 'Pricing Inter-Divisional Transfers', Management Accounting (U. S. A.) (November 1966) pages 10-18, the suggestion is made that the profit in these situations should be allocated to the divisions involved. This approach would not provide a meaningful measure of each division's worth.

because any financial decision will influence either or both costs and revenues, the actions taken by division managers may be oriented towards improving profits. Other objectives of a financial nature<sup>13</sup> will exist in most firms, so that an improvement in the value of sales or the retention of a certain percentage of the market for a particular product, may be dominant objectives. In these situations the existence of profit reports will not necessarily improve the actions taken by division managers, as the contents of these reports are oriented towards different objectives.

#### 2.4 The Concept of Profit:

Because of the range of purposes for which the profit report may be used it is necessary that the particular purpose is matched with the appropriate profit concept. Shillinglaw<sup>14</sup> suggests four concepts which may usefully be employed and these are:

- (a) Sales margin.
- (b) Controllable profit.
- (c) Contribution margin.
- (d) Net profit.

Sales margin, which is calculated as the sales revenue less the variable expenses incurred in producing that revenue, may be usefully employed in making short-run operating decisions such as the acceptance or rejection of an order.

The controllable profit concept, consisting of the sales margin less those fixed expenses controllable by a particular division manager, will be an important concept for evaluating the performance of a division manager. In the survey undertaken, twenty-one companies replied to a question which asked whether only those expenses controllable by a division manager were

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<sup>13</sup> It is recognised that important objectives of a non-financial nature do exist; however, the present discussion is limited to the financial aspects of a division's performance.

<sup>14</sup> Shillinglaw, G., 'Guides to Internal Profit Measurement', Harvard Business Review (March-April 1957) pages 82-94.

deducted to obtain the profit figure for managerial evaluation. Initially, ten indicated that the deduction was limited to controllable expenses; however, after interviewing the executives concerned, only three continued to state that a net profit figure, in the accepted financial accounting sense, was used. The balance replied that the main evaluation was on the basis of controllable<sup>15</sup> items, with a deduction being made for general or central management expenses. Those companies using a true net profit concept justified their action with comments such as:

"It is necessary to recover such expenses, thus divisions must be charged for them",

"It makes the manager aware of their existence and the allocation is important as pricing is based on the cost figures".

Replies such as these indicate a lack of understanding of the distinction between assessing a manager's performance and considering the economic worth of a division's resources. This misunderstanding does not occur when evaluation is in terms of controllable items, with a later deduction for allocated expense items, so as to measure the economic worth.

Using the contribution margin concept will be appropriate when undertaking long-run investment type decisions, including dismantling or expanding any division. This particular concept consists of sales revenue less variable expenses, controllable fixed expenses and those fixed expenses traceable to a particular division.

The use of the net profit concept, namely the contribution margin less an amount of non-traceable fixed expenses allocated to a division, is justified when the purpose is to evaluate the economic worth of the resources in a particular division. Deducting an amount for central management expenses from the controllable profit figure, an action which was undertaken by almost all of the companies surveyed, would enable this

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<sup>15</sup> An important question of terminology arises, as the majority of the executives conceived "controllable" to mean "directly relating to". Thus, although in most situations many of the costs directly relating to a division would be controllable by the particular manager, there is no guarantee of this in a given company.



purpose to be achieved as long as the deduction is not arbitrarily established.

### 2.5 Applying the Profit Concept:

Having established that different concepts of profit will be required for specific purposes, it is essential to realise that the appropriateness of any concept will be partly determined by the manner in which the profit measure is applied. Several possible approaches to using the profit concepts exist and these include:

- (a) Comparing the profit figures obtained and ratios calculated for several divisions within a firm.
- (b) Comparing the results of individual divisions, measured in monetary or ratio terms, with external firms operating in the same industry group.
- (c) For any division comparing a past year's results with those obtained in the current year.
- (d) Comparing the results for the present year with the budget established for the current year.

Without examining each of these methods in detail it will be apparent that they are not all equally applicable to both the purposes of assessing the performance of a division manager, and of measuring the worth of a division's resources. Rather, the appropriate method, or methods, must be selected so that having determined the most suitable profit concept the results are not nullified by incorrect application.

### 2.6 Problems of Using a Profit Concept:

Having examined the purposes of a profit concept for reporting the results of divisions, and having considered the use of appropriate concepts in a division, it is necessary to review two particular problems which may arise as a consequence of considering divisions as profit units.<sup>16</sup> The

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<sup>16</sup>It is not suggested that these problems are peculiar to profit centres. However, in the survey undertaken the predominance of divisions considered as profit centres has resulted in a concentration on this type of division.

first concerns the degree of control over a range of variables which will be extended to division managers, whilst the second is the pricing of internal transfers between divisions and this will be explained in later chapters at considerable depth.

So as to test the degree of control extended to division managers, the companies in the survey were asked to indicate the control extended to division managers for a range of variables. Table VI indicates the nature of the control extended to division managers over aspects of raw material and labour acquisition and usage.<sup>17</sup>

TABLE VI : Distribution of control extended to division managers for raw material and labour inputs.					
INPUT FACTORS	DEGREE OF CONTROL				
	A	B	C	D	E
<b>LABOUR:</b>					
Rates paid	6	9	3	2	1
Right to hire and to dismiss employees:					
(a) Factory level	18	3	-	-	-
(b) Others in division	4	14	2	-	1
Payment or alteration to bonus or incentives of -					
(a) Factory level employees	5	4	7	3	2
(b) Other employees in division	-	4	7	3	7
<b>RAW MATERIAL:</b>					
Source of purchase	7	11	2	-	1
Price to be paid	5	10	2	3	1
Type or quality	6	12	2	1	-
<b>KEY:</b>					
	A. Total control.		D. Little control.		
	B. Predominant control.		E. No control.		
	C. Partial control.				

With labour the greatest degree of delegated control was the right to hire and dismiss factory level employees. Of the twenty-one replies to this question, only three companies extended less than total control. For

<sup>17</sup> The replies are from only those companies who use a profit concept for divisional evaluation.

other employees in the division, fourteen companies extended predominant control, whilst four extended total control. With this category of labour the predominant control usually required division managers to refer the proposed employment or dismissal of salaried employees to the personnel manager, or with senior employees to the central management group. No other aspect of the operations was delegated to the same extent as control over factory level employees, thus enabling a particular manager to control the quantity of labour he employed. The other factor which was questioned with regard to labour concerned remuneration. Only six companies gave complete control, and nine predominant control, over the rate at which employees could be paid. Similarly, the use of bonus or incentive payments was restricted to five companies giving complete control to division managers, four predominant control, and seven partial control, out of a total of twenty-one replies. The pattern for employees other than factory level staff showed considerably more restriction with no firm giving complete control, seven giving partial control, and seven no control. By restricting the control division managers have over the payments made to employees, the central management group is influencing both the quality of personnel which may be employed, and the use which may be made of monetary rewards as an incentive device.

All three aspects of raw material acquisition which were questioned produced similar responses, that is, between five and seven companies giving complete control over the source of purchase, the price to be paid and the quality of materials acquired. Between ten and twelve companies extended predominant control over the same factors to their division managers. This pattern of control may be forced on a particular company because of the lack of alternative sources of supply or by a desire to achieve lower prices through the receipt of quantity discounts or the establishment of contracts with individual suppliers.

When considering aspects of production, Table VII indicates that the control over both the design of products and the mix of products being

TABLE VII : The control extended to division managers over three aspects of production.					
PRODUCTION FACTORS	DEGREE OF CONTROL				
	A	B	C	D	E
The design of products or components comprising the output of a division	5	10	3	2	1
The actual mix of products or components produced by a division	5	11	4	-	1
The level of production in a division measured by the units produced	8	10	3	-	-
<u>KEY:</u>	A. Total control.		D. Little control.		
	B. Predominant control.		E. No control.		
	C. Partial control.				

manufactured was delegated to a considerable degree, with five of the twenty-one responding companies giving complete control to division managers, and ten or eleven giving predominant control.<sup>18</sup> The level of production was subject to an even greater degree of decentralisation, with eight companies extending complete control and ten predominant control over this factor. Undoubtedly these results reflect a substantial degree of independence existing between divisions, such that the output of any division may be sold on an external market where the level of units produced does not coincide with the demands of another division. As the existence of available external markets diminishes, or the need to co-ordinate the levels of production between divisions increases, the degree to which control over these factors is decentralised is likely to be reduced. Table VIII<sup>19</sup> illustrates that in the small sample used, those firms which have a considerable portion of the output of one division transferred to another division extend less control over production to division managers.

<sup>18</sup> The data for companies organised on a functional basis has been excluded from the table as they did not generally use a profit measure for divisions. Such companies extended a little or no control over these factors due to a desire to co-ordinate output levels.

<sup>19</sup> The table is constructed by weighting the differing percentages of transfers between divisions within a firm to obtain a single average level of transfers for each firm.

TABLE VIII : The relationship of the degree of control over production to the dependency between divisions.					
PERCENTAGE OF TRANSFER	DEGREE OF CONTROL				
	A	B	C	D	E
0 - 10	3	5	1	-	-
11 - 20	1	1	-	-	-
21 - 40	-	2	1	-	-
41 - 60	-	-	1	1	-
61 - 80	-	-	-	-	-
81 - 100	-	1	-	1	3

KEY:      A. Total control.  
                     B. Predominant control.  
                     C. Partial control.  
     D. Little control.  
     E. No control.

The authority for making capital expenditure decisions has traditionally been centralised and this is confirmed by the results presented in Table IX.

TABLE IX : The extent of delegated control over different levels of capital expenditure.					
LEVEL OF CAPITAL EXPENDITURE	DEGREE OF CONTROL				
	A	B	C	D	E
0 - \$ 100	16	4	1	-	-
\$ 101 - \$ 500	9	4	1	4	3
\$ 501 - \$ 1,000	3	2	4	4	8
\$1,001 - \$ 5,000	-	2	7	3	9
\$5,001 - \$10,000	-	1	4	5	11
Higher than \$10,000	-	1	4	5	11

KEY:      A. Complete control.  
                     B. Predominant control.  
                     C. Partial control.  
     D. Little control.  
     E. No control.

Only with individual capital expenditure projects involving amounts up to \$100 did the majority of companies, sixteen out of twenty-one, give complete control to division managers. For amounts up to \$500, thirteen companies gave complete or predominant control, whilst seven gave little or no control. Expenditure in excess of \$1,000 is in most firms closely controlled by central management, with two yielding predominant control

to division managers, and twelve little or no control. In the final two categories of capital expenditure, that is, amounts exceeding \$5,000, one company<sup>20</sup> gave predominant control, and sixteen little or no control to division managers. The centralised control may be due to the monetary amounts involved. However, it is likely that the committal of a portion of the firm's scarce resources, particularly capital, for a long period of time and the lack of controllability over expenditure on capital projects would considerably contribute to this decision.

In an attempt to establish whether there is any relationship between the overall control extended to division managers within a firm and the level of transfers between the divisions, Table X has been constructed. The table is derived from the responses of each company, within a particular transfer group, to the variables listed in Tables VI, VII and IX, these responses being grouped into the five specified degrees of control. Thus;

PERCENTAGE OF TRANSFER	DEGREE OF CONTROL				
	A	B	C	D	E
< 10	24%	39%	13%	9%	15%
11 - 20	37%	20%	18%	7%	18%
21 - 40	19%	31%	23%	18%	9%
41 - 60	27%	20%	20%	10%	23%
61 - 80	-	-	-	-	-
81 - 100	24%	28%	15%	4%	29%

**KEY:**      A. Complete control.  
                  B. Predominant control.  
                  C. Partial control.  
                  D. Little control.  
                  E. No control.

for any transfer group the percentages listed under each degree of control represent the relative significance of each category of control. It was anticipated that as the dependency between divisions increases, less

<sup>20</sup>This company is organised as a small number of large divisions each exceeding the size of most New Zealand companies. In addition, the company is characterised by a high degree of divisional autonomy and complete accountability for net profit by the division managers.

freedom may be granted to the individual managers over the variables listed in the preceding discussion. Although the table does not indicate any really significant pattern, two features are of interest. As indicated in Table XI, when the dependence between divisions increases the significance of control in the complete and predominant groups tends to decline, from

PERCENTAGE OF TRANSFER	Complete and Pre-dominant Control	Little and No Control
	Percentage of Total Responses	Percentage of Total Responses
< 10	63%	15%
11 - 20	57%	18%
21 - 40	50%	9%
41 - 60	47%	23%
61 - 80	-	-
81 - 100	52%	29%

63% of the responses when less than 10% of production is transferred, to 47% when 41-60% of production is transferred. A rise to 52% of the responses occurs when between 81-100% of production is transferred internally. A similar pattern exists for the categories of little and no control as the percentage of responses in these two categories rises from 15% when less than 10% of production is transferred internally, to 29% when between 81-100% of production is transferred internally. Thus it would seem likely that the extent to which control over the operations of a division is granted to the division manager, may be related to the dependency between the divisions as indicated by the level of internal transfers.

The second problem area to which reference has already been made concerns the existence of transfers between divisions. Such transfers may reduce the independence of individual divisions, and may also reduce the effectiveness of employing a profit concept as a measure of the performance of any division. As was indicated earlier, the existence of transfers, and thus the need to co-ordinate more closely the production levels of divisions, reduces the freedom individual managers have to control their operations.

Furthermore, transfers between divisions usually result in restrictions on the source of purchase for inputs to a particular division or the customers to which the outputs of any division may be sold, so that preference is created for internal transactions. This, although reducing the control of division managers, would be acceptable if the price at which the transfers are made represents the economic value of the products or services in an external market. However, the price so often adopted bears little or no relationship to the external price and, although convenient, distorts the usefulness of a profit concept.

## 2.7 Is a Profit Concept Acceptable?

This chapter has considered the role which a profit concept may play in assisting the evaluation of the economic worth of any division in the firm as well as providing a basis for assessing how effectively a manager has employed these resources. In examining the extent to which control is delegated to division managers it is apparent that even when no transfers occur between divisions it is likely that considerable control will be retained by central management. When transfers do occur this retention of control may be even more significant.

Earlier in the chapter it was suggested that when evaluating the performance of any manager only those factors which he is able to control should be considered. The problem which arises, and was illustrated in Tables VI, VII, VIII and IX, is that a particular manager may have control over insufficient variables to make the profit measure a meaningful one, and with the remaining variables his control may only be partial. Whenever transfers occur between divisions further restrictions may exist to nullify the use of a profit concept for this purpose. In addition, the pricing of these transfers may mean that the efforts of any manager are distorted, perhaps because his division is required to transfer more of its output than other divisions at this illogical transfer price, or because the percentage of production transferred varies over time thus influencing the results he is able to achieve.



When considering a division's economic worth, the extent to which control is vested in a division manager may not influence significantly the applicability of the profit concept, provided that central management acts in an equitable manner. However, the existence of transfers, priced so that they are not equivalent to external transactions for the same products or services, will distort any comparison made with other firms in the same industry, with other divisions in the firm, or with a previous year's performance. This is caused by individual divisions being involved to different degrees in the internal transfer of products, or a change over time in the extent to which a particular division is concerned with internal transfers.

The importance of a profit measure, as an aid to decision-making by managers of divisions, may be diminished in those situations where a manager must accept data which is incorrect or not suitable for a particular purpose. For example, the existence of transfer prices which are developed illogically may mean that decisions such as capital expenditure, or to expand production of a specific product line, are made in a way which is detrimental to the firm, and perhaps to the division concerned.

PART II

THE PRICING OF INTER-DIVISIONAL TRANSFERS

CHAPTER III  
HISTORICAL DEVELOPMENTS  
OF TRANSFER PRICING METHODS

3.1 Introduction:

Historically the major developments in cost accounting have occurred in the nineteenth and twentieth centuries. This is a consequence of the creation of an industrial state no longer associated with a domestic cottage industry, but with large factories and entrepreneurs interested in a profit. Large amounts of capital expenditure, production processes of greater complexity and increased competition all contributed to the need for cost accounting procedures. Associated with the development of factories and output passing through a long series of production processes was the need to record the transfers of products between the stages in processing. This has led to the development of systems to record the physical quantities of product transferred and to value or price the transfers. Originally the purposes of recording internal transfers were limited to a need to maintain control over the quantities of output at each production stage, and to value inventory. These purposes were closely followed by attempts to measure the "profit" obtained at each stage in production.

The systems for pricing internal transfers developed over a relatively short period of time, principally between the 1880's and the 1930's, so that by 1930 many of the methods now commonly adopted by business firms for pricing transfers had already appeared in accounting literature, and had been applied in practice. Recent years have seen a resurgence in the development of transfer pricing techniques more directed towards the optimisation of a firm's profit by the use of centrally derived mathematical models. At this point it is, however, the period up to the 1930's which is of particular interest.

## 3.2 Pre-20th Century Developments:

The nineteenth century witnessed the appearance of publications which made incidental reference to the existence of inter-departmental transfers. In 1817 a French author, Payen,<sup>1</sup> discussed the procedures necessary to record the manufacture of horse carriages. Included in the discussion was an explanation of the method for collecting the costs incurred in the two departments: enterprise - the manufacturing section, and warehouse - the storage and disposal section. The accounts show the enterprise portion of the business being discharged of its accountability, when the completed units are transferred to the warehouse. These transfers were valued at the sum of the actual costs incurred to manufacture each particular carriage. An example of the method used is reproduced<sup>2</sup> below:

<u>JOURNAL IN MONEY</u> <sup>3</sup>			
	<u>Dr.</u>		<u>Cr.</u> <u>Profit</u>
The business is accountable for		Carpenter	407
	3,664	Smith	875
		Lumber merchant	972
		Wheelwright	645
		Saddler	190
		Painter	575
		<u>3,664</u>	
The warehouse receives three carriages	3,664	The business is discharged of	3,664
A buys Carriage No. 1	2,045	Warehouse is discharged by Carriage No. 1	1,975    70

At the same time in England a similar development occurred which was concerned with costing in the woollen industry. One author<sup>4</sup> observed

<sup>1</sup>Payen, A., 'Essai sur la tenue livres d'un manufacturies' (Paris : 1817).

<sup>2</sup>From Littleton, A. C., 'Accounting Evolution to 1900' (New York : Russell and Russell, 1966) pages 324, 325.

<sup>3</sup>Only a portion of the journal is reproduced for the purpose of illustration.

<sup>4</sup>Cronhelm, F., 'Double Entry by Single' (London : 1818).

that the materials records required accounts for raw materials, goods in the process of manufacture and finished goods. The physical units were transferred into the process account according to a standard measure of output, whilst the output actually achieved was credited to the process account in the same unit of measure. At the same time the completed output was debited to the finished goods account. The interesting feature of this system is that only physical quantities, and not monetary amounts, were used for the transfers so that in terms of complexity this method is more primitive than the French one discussed above. Justification for only transferring quantities may exist because of the difficulties which would have occurred if actual costs for batches, in a process type of industry, were associated with output units. Payen was able to identify each unit of output with the costs incurred because of the job form of production.

After a period of approximately seventy years during which the problems of internal transfers were largely ignored, Norton,<sup>5</sup> an English author, presented a major contribution to the theory of internal transfers. He proposed that the commercial and manufacturing records of a business must be quite distinct, with the latter being subordinated. Foremen in each department were required to maintain records of the work which had been completed in their section. This data was conveyed to the central accounting office where it was priced according to the external or market prices for the particular type of processing. The manufacturing account showed the work completed in each department, priced at the external charges for the processing, together with the costs of materials consumed. When compared with the sales prices of the output and the unsold stock, a "profit" or loss figure will result. This figure represented the earnings from the non-manufacturing or commercial section of the business which would have occurred if the processing had been undertaken by an external party. In addition, the manufacturing account compared by individual departments the actual costs incurred in a particular time period and the

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<sup>5</sup>Norton, G.P., 'Textile Manufacturers Bookkeeping' (London : 1889).

output achieved, valued at the external price for each type of output. Such a system considers each department as a separate entity with its own "profit" or "loss" and avoids the problem of pricing internal transfers because each department's own costs, plus an apportionment of the firm's overhead, is compared with the external cost of completing the particular process undertaken in the department.

### 3.3 Developments in the 20th Century:

The work of Norton in treating each department as a separate profit entity, remained the authority for internal transfers until the end of the first decade of this century. In 1909 Lisle<sup>6</sup> illustrated a method<sup>7</sup> for identifying the profit on manufacturing and the profit on trading. This required the manufacturing account to be debited with the costs incurred and credited with the output, priced at the cost of having an external manufacturer produce the output. The trading account would be debited with the cost of purchasing rather than manufacturing the products sold, and credited with the final selling price of the output to the firm's customers.<sup>8</sup> One problem which was ignored by Lisle concerned the difficulty of establishing a market or trade price. However, Garner<sup>9</sup> states that in 'The Encyclopaedia of Accounting' reference was made to using cost plus a percentage mark-up should any difficulty occur when establishing a market price.

Support for this method of pricing internal transfers was given by

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<sup>6</sup>Lisle, G., 'Accounting in Theory and Practice' (Edinburgh : William Green & Sons, 1909).

<sup>7</sup>Two other methods are considered by Lisle including the accumulation of costs. However, Lisle considered them to be less satisfactory than the method outlined.

<sup>8</sup>Garner, P. in 'Evolution of Cost Accounting to 1925' (Alabama : University of Alabama Press, 1954) refers to a similar idea proposed in 1903 by an unknown author. This idea appeared in 'The Encyclopaedia of Accounting' (London : William Green & Sons, 1903) and Garner considers that the idea may be attributed to Lisle who was the editor of the Encyclopaedia.

<sup>9</sup>Ibid., page 277.

Dicksee<sup>10</sup> who, when considering the example of a shoe factory, suggests:

"A definite scale of prices must therefore be arranged as between one department and another, each department being treated as having earned its profit as soon as it has completed its part of the whole process of manufacture."

Thus the prices to be used to yield a profit at each stage must be the market or external price associated with each process.

The two views just outlined appear to have been representative of contemporary English authors.<sup>11</sup> However, they were criticised by American authors, including Webner,<sup>12</sup> who stated that the normal method of pricing transfers was to accumulate the costs in each department and to transfer at this amount plus any costs incurred in preceding departments. Of the scheme suggested by Dicksee, he comments:

"There is little to commend such a plan. No profits are made until goods are sold, nor can either the factory as a whole, or any department therein be consistently considered as making a profit. The factory delivers its production at cost to the commercial department, and it is the function of this department to realise profits for the entire establishment."

This method will provide an inventory figure which does not overstate the value and thus avoids the need to create a reserve, which, under the proposal of Dicksee, is necessary to avoid the possibility of losses at the time of final sale.

During and following the period of the 1914-1918 World War the American opinion on interdepartmental transfers appears to have dominated, and English authors proposed the use of accumulated costs as the

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<sup>10</sup> Dicksee, L. R., 'Advanced Accounting' (London : Gee & Co., 1911) page 236.

<sup>11</sup> An important exception would be Gary, H. S., 'Process Cost Accounts' (London : Gee & Co., 1908) who proposed that transfers should be priced at an accumulated cost figure.

<sup>12</sup> Webner, F. E., 'Factory Costs' (New York : The Ronald Press Company, 1911) pages 279-280.

appropriate pricing method. For example, in 1918 Lunt<sup>13</sup> refers to internal transfers occurring at a cost figure comprising material, labour and a portion of allocated overhead, the cost figure to be adjusted on a regular basis as a moving average. An address by another English author, Newman,<sup>14</sup> in 1921 confirms the prevailing view. It is suggested that the product will be transferred at manufacturing cost as:

"The question of profit only arises after the article is finished and manufactured and is handed over to the selling department. The selling department makes the profit . . . The profit as between departments is an unknown quantity and not ascertainable."

The 1920's brought a changing attitude to the pricing of internal transfers, with greater emphasis being placed on the use of market or external prices. An American author, Bliss,<sup>15</sup> suggested in 1922 that transfers between departments within the meat cutting and packing industry should be made at a market price. Each department should be charged for the "full value" of its material inputs, whether they come from an external or internal source. Similarly, each department must be credited with the full market value of their output. Bliss observes that each department of a meat cutting factory must be commercially viable and thus it is necessary to use an "opportunity cost" concept for pricing the transfers. Thus, by using this price base a department is placed in competition with external firms and, if it was to show a loss or an insufficient return on the investment, by using the market transfer price the company would close down the particular department as uncompetitive. The work of Bliss was one of the first attempts to attach an economic meaning to the transfer price being used and the concept of "opportunity cost" as a means of setting the transfer price was not seriously revived until the 1950's.

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<sup>13</sup> Lunt, H. J., 'Departmental Cost Keeping for Small Business', The Accountant (July 6, 1918) pages 4, 5.

<sup>14</sup> Newman, E. W., 'The Functions of Costing', The Accountant (March 19, 1921) pages 330-336.

<sup>15</sup> Bliss, J. H., 'Cost Methods in the Packing Industry', National Association of Cost Accountants (April 15, 1922).



A more cautious approach to the idea of opportunity costs was provided by Dohr<sup>16</sup> in 1924 who considered two methods of pricing transfers. The first transfers a product through several processing stages by accumulating the costs incurred in each department, whilst the second includes a profit element at each stage of production. Dohr states that no profit is earned or realised merely by an internal transfer of units. When an external market exists for the product at its intermediate production stages, support is given to the theory of opportunity costs established by Bliss. However, he comments that although this may be used for internal accounting, it is of no value for external accounting as the inventory value will be overstated and an element of unrealised profit included.<sup>17</sup> Furthermore, he concludes that even for the purposes of internal accounting the decision to sell intermediate output externally or to transfer it internally could be made by "statistical computation" and "the method of transferring forward at cost is found to be more satisfactory".<sup>18</sup>

Further evidence of the changed American viewpoint is contained in a discussion amongst five practitioners and an academic accountant in 1925.<sup>19</sup> With the exception of one participant, agreement on the use of market price for internal transfers existed. It is interesting to observe that by this time many companies had their activities spread over several factories and some of the practitioners involved were from firms having geographically separated factories. This separation may have been an important factor leading to the acceptance of transfer prices based on the market as managers could more easily equate the idea of sales to external parties and transfers to geographically separated factories being made at the same or similar prices. Previously the existence of single factory companies

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<sup>16</sup> Dohr, J. L., 'Cost Accounting - Principles and Practice' (New York : The Ronald Press Company, 1924).

<sup>17</sup> Bliss referred to this problem. However, he concluded that as the inventory levels were relatively constant over a period of time, the amount of unrealised profit would in any period be insignificant.

<sup>18</sup> Ibid., page 103.

<sup>19</sup> National Association of Accountants Yearbook, 1925, pages 194-197.

may have inhibited the adoption of such prices.

In the period up to 1930 only one author<sup>20</sup> is known to have provided an adequate analysis of the transfer pricing methods. The application of either cost or market based transfer prices was examined from three viewpoints:

- "(i) to judge the effectiveness of management;
- (ii) to determine manufacturing policy;
- (iii) to measure the adequacy of return upon investment."

Previous authors had given little attention to the reasons for developing reports on the operations of individual departments and consequently their conclusions often ignored many of the more important problems. Camman, after examining the advantages and disadvantages of the two price bases, concludes by suggesting that the additional complication of using market prices will outweigh any greater benefits.

The 1950's produced a considerable quantity of business literature directed towards discussions of divisional evaluation, profit centres and the impact of various transfer prices on systems of profit evaluation. Although authors such as Dean,<sup>21</sup> and Cook,<sup>22</sup> have examined the problems of installing and operating systems of transfer prices, and in particular have considered the distortion likely to arise from using inappropriate transfer prices, they have failed to consider that the concept of using profit centres and in turn market based transfer prices may be unacceptable when dependencies exist between divisions.

Authors including Hirshleifer<sup>23</sup> and Gould<sup>24</sup> considered the issues of

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<sup>20</sup> Camman, E. A., 'Interdepartmental Profits', Journal of Accountancy, July 1929, pages 37-44.

<sup>21</sup> Dean, J., 'Decentralisation and Intracompany Pricing', Harvard Business Review (July-August 1955) pages 65-74.

<sup>22</sup> Cook, P. W., 'Decentralisation and the Transfer Price Problem', Journal of Business (April 1957) pages 87-94.

<sup>23</sup> Hirshleifer, J., 'On the Economics of Transfer Pricing', Journal of Business (July 1956) pages 172-184.

<sup>24</sup> Gould, J. R., 'Internal Pricing in Firms When there are Costs of using an outside market', Journal of Business (January 1964) pages 61-67.

transfer prices from the viewpoint of classical economic theory. Their aim was to establish transfer prices which would guide division managers towards achieving an optimal profit level, rather than adopting transfer prices which were compatible with divisional profit centres.

Towards the end of the 1950's, and in the 1960's, authors such as Bierman,<sup>25</sup> and Henderson and Dearden,<sup>26</sup> have recognised that the application of the profit centre concept and market based transfer prices may not provide an appropriate basis for ensuring that division managers act in the best interests of the whole firm. Rather the use of incremental costs and appropriate systems of divisional reporting have been suggested. The idea of co-ordinating divisional and firm interests has received considerable impetus in the last decade, as authors including Arrow<sup>27</sup> and Baumol<sup>28</sup> have examined the derivation of transfer prices from the viewpoint of scarce resource allocation and mathematical programming models.

#### 3.4 Concluding Comments:

The development of transfer prices has, as is the position with many accounting practices, arisen to meet a specific need from business units, in this case to record and value internal transfers of products. Initial attempts by Norton were more concerned with ensuring that the profitability of the manufacturing and selling portions of the firm were established. Later, English authors extended the concept of market priced transfers as essential to establishing the profitability of sections within a firm.

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<sup>25</sup> Bierman, H., 'Pricing Intracompany Transfers', Accounting Review (July 1959) pages 429-432.

<sup>26</sup> Henderson, B. and Dearden, J., 'New System for Divisional Control', Harvard Business Review (September-October 1966) pages 144-160.

<sup>27</sup> Arrow, K.J., 'Optimization, Decentralisation and Internal Pricing in Business Firms' in 'Contributions to Scientific Research in Management' (Los Angeles : Western Data Processing Centre, 1959).

<sup>28</sup> Baumol, W.J., 'Economic Theory and Operations Analysis' (Englewood Cliffs : Prentice Hall, 1965).

American authors supported a system of pricing at cost apparently more concerned with problems of inventory valuation and income determination for the whole firm. Following a period just after World War I during which English writers shifted their viewpoint to be consistent with that held in the U.S.A., a major reversal occurred. The dominance of large companies perhaps growing by mergers and often operating in geographically separated areas was one of the factors responsible for a change in American opinion. Authors now supported the concept of profit centres and market based transfer prices as being an essential aspect of efficient business operation.

By 1930 the concept of market prices for internal transfers was well established, so much so that the literature of the 1950's and early 1960's, although considerably more refined, did not offer methods illustrating new principles. Even the recent literature suggesting that prices should guide individual managers towards the best result for the whole firm was recognised in a simple way in 1922.

CHAPTER IV  
THE TRANSFER PRICING PROBLEM

4.1 What are transfer prices? :

The term "transfer prices" has been variously defined by authors writing in this field and their understanding includes definitions such as: "a set of internally derived prices for guiding the intra-company transfer of productive resources",<sup>1</sup> "the intra-company charges at which goods or services are sold by one organisational unit to another in the same company",<sup>2</sup> "the pricing of goods and services that are exchanged between ... divisions within a firm",<sup>3</sup> and "the net value per unit that records the transaction for the purposes of operating statements".<sup>4</sup> Although differences exist in the terminology employed, these definitions have, as elements, the idea of a transfer between sections of a company, the transfer may apply to goods or to services, and that the transfer involves a value or a price. Two of the authors orient their concept of a transfer price towards a particular purpose, in the case of Dopuch and Drake, the guiding of resource transfers, and with Dean towards the preparation of operating statements. Indeed, Hirshleifer in the article already quoted suggests that the purpose of transfer prices is "to induce divisions to act so as to maximise the profit of the firm as a whole". Thus, in addition to the characteristics necessary to establish the concept of a transfer price there is the need to consider the price with regard to a particular purpose or purposes. This question of "purpose" will be examined in more detail in this and succeeding chapters.

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<sup>1</sup> Dopuch, N. and Drake, D.F., 'Accounting Implications of a Mathematical Programming Approach to the Transfer Price Problem', Journal of Accounting Research (Spring 1964) page 10.

<sup>2</sup> Goetz, B.E., 'Transfer Prices : An Exercise in Relevancy and Goal Congruency', The Accounting Review (July 1967) page 435.

<sup>3</sup> Hirshleifer, J., 'On the Economics of Transfer Pricing', op.cit., page 172.

<sup>4</sup> Dean, J., 'Decentralisation and Intracompany Pricing', op.cit., page 66.

#### 4.2 The Need for Transfer Prices:

In Chapters I and II some attention was given to the situations which may lead to the establishment of divisions within a business organisation. The suggestion was made that the results of each division must be accumulated and presented in such a manner that the objectives of measuring the results are fulfilled. Financial results could be reported in terms of a cost or a profit concept depending on factors including the structure of the firm, and the degree to which control is vested in the division managers. One particular aspect, the dependency of one division on another for part or all of its inputs or service facilities, considerably complicates the preparation of reports for individual divisions.

Solomons<sup>5</sup> summarises the position by stating:

"Whenever transactions between divisions made up more than a negligible proportion of the total transactions (of a division) it is obvious that the division's relative profitability can be very much affected by the formulae used for pricing interdivisional business. The more important these interdivisional transactions become the more dependent is the whole system of profit measurement on the system of transfer pricing."

This statement fails to recognise that because of the diverse purposes which may be served by the reports of divisions, then not only may transfer prices influence the reports based on profit responsibility, but reports based only on costs may be influenced by the formula used for pricing transfers.

Whenever transfers between divisions do occur, the impact on each party involved and thus the effect on decisions which may be made, or evaluations which may be undertaken, cannot be ignored. One possible way of reducing the difficulties associated with pricing internal transfers is to undertake a re-organisation of the firm, so as to minimise the extent of the transfers and thus the degree of possible distortion. Such action would suggest that the benefits associated with the present organisation structure will not be reduced, or that the new benefits likely to arise from avoiding

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<sup>5</sup>Solomons, D., op. cit., page 161.

transfers will offset any loss of benefits caused by reorganising the existing structure. Such an approach does not solve the problems of pricing internal transfers but rather it avoids the problems by minimising their likely impact.

A second, and somewhat more feasible, approach to avoiding the problems of pricing transfers is to establish some arbitrary price and to allow division managers to buy their inputs, or to sell their outputs, either internally or externally without any restrictions. Table XII illustrates the freedom which division managers in the responding companies have to purchase inputs, or to distribute outputs outside the organisation, when they are available from or required by another internal division. Of the twenty-eight companies who replied, nine indicated that on no occasion in these

DEGREE OF FREEDOM	Percentage of internal transfer <sup>6</sup>					
	0-10	11-20	21-40	41-60	61-80	81-100
Always	1	-	-	-	-	-
Frequently	2	-	-	-	-	-
Sometimes	1	-	2	1	-	-
Special Cases	5	2	2	1	-	2
Never	1	2	-	-	-	6

circumstances could a division manager purchase inputs from, or sell outputs to, a market outside the firm. Twelve companies replied that the right to trade externally was only granted in special cases. When a group of the respondents was interviewed, approximately one half stated that the main condition which was placed on the freedom was that internal demands were satisfied first, whilst most of the others replied that external purchases and sales could occur whenever a better price was obtainable in the external

<sup>6</sup> A weighted average figure has been obtained for each company and used in this table, assuming that each company would have a single policy for external trading.

transaction.<sup>7</sup> As can be seen from the table, only three companies granted considerable freedom for external purchases and sales, and in all cases the percentage of transfers was small. One executive stated that the aim of establishing divisions was to encourage a competitive atmosphere amongst the divisions, therefore allowing this freedom was an essential part of developing competitive and efficient units.

Table XII reveals one interesting relationship concerning the level of internal transfer and the degree of freedom to trade externally.<sup>8</sup> Two clusters of observations exist, one indicating that when less than 10% of production is transferred internally, three of the ten companies in this category gave their division manager freedom to trade externally, either always or frequently. The other cluster is when between 81% and 100% of production is transferred internally, and in this category all eight companies who replied gave division managers freedom to trade externally only in special cases or on no occasions. Such a result is not unexpected as a greater need probably exists to co-ordinate the output levels of divisions when internal transfers predominate. This may be a consequence of an attempt to ensure that the firm receives the greatest benefit from the overall production and distribution functions, or due to the absence of a market for the intermediate products, or because of the organisation structure adopted.

The granting to division managers of sufficient control to enable them to trade on the external market may be used selectively, in the interests of the whole firm. Although this aspect was not investigated in the firms surveyed it would be possible for central management to establish a guideline which requires division managers to sell a percentage of their output

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<sup>7</sup> A better price may occur when divisions are geographically dispersed and internal transactions would involve additional, possibly substantial, transportation costs.

<sup>8</sup> The trend indicated by this table must be considered with caution because of the limited nature of the sample and the averaging used to obtain a single level of transfers for each company.



on the external market. This may provide both the division managers and central management with an indication of the efficiency of any division in relation to the firms comprising the external market. If the internal costs to manufacture the product are in excess of the market price for the same product a guide for possible managerial action would be available.

Similarly, the decision to grant freedom to trade externally could be determined by the significance of the items involved. For example, if only small quantities of a product are used on an irregular basis, it may be in the best interests of the firm to allow external purchase to occur, as it is possible that the price obtained will be lower than the internal costs of producing a small quantity. However, if a large amount of capital expenditure is required to undertake the production of any item the feasibility of allowing a freedom to trade externally may be reduced.

#### 4.3 The Importance of Interdivisional Transfers:

If the two approaches just discussed to avoid the problems of establishing appropriate transfer prices are unacceptable, indeed, as was illustrated, the second approach is empirically not accepted, then it is necessary to consider how important intra-company transfers are and by what methods they should be priced.

The data presented in Table XII indicates that in the companies surveyed the percentage of their production transferred to another division extends over the possible range of from less than 10%, up to 100%. In Table XIII a more detailed examination of internal transfers is made, by considering both individual industry groups and the numbers of divisions involved in each percentage group, rather than an average for the whole firm.

From the table it is apparent that when all industry groups are considered many companies have divisions which either transfer internally a small proportion of their production or a very substantial part of their production. With the former, out of a total of 204 divisions, 93 or 45%,

TABLE XIII : The importance of transfers analysed by industry groups.<sup>9</sup>

PERCENTAGE OF TRANSFER	INDUSTRY GROUP								TOTAL
	1	2	3	4	5	6	7	8	
< 1%	7	11	13	2	-	3	3	14	53
1 - 10%	5	4	11	-	-	2	7	12	41
11 - 20%	2	2	1	-	1	1	4	1	12
21 - 40%	1	2	2	-	-	2	8	3	18
41 - 60%	-	5	-	-	-	2	14	2	23
61 - 80%	-	5	1	-	-	1	1	-	8
81 - 100%	2	8	4	3	9	21	1	2	50
Total:	17	37	32	5	10	32	38	34	

KEY:

- |                           |                                     |
|---------------------------|-------------------------------------|
| 1. Foodstuffs, Chemicals. | 5. Consumer Goods, Home Appliances. |
| 2. Textiles, Clothing.    | 6. Forestry, Pulp and Paper.        |
| 3. Engineering.           | 7. Retail, Finance.                 |
| 4. Vehicle Manufacture.   | 8. Printing, Packaging.             |

have ten per cent or less of their production internally transferred. Considering individual industry groups, low percentages of transfers occur in the engineering, foodstuffs-chemicals, and printing-packaging groups. Although no single reason may be established for this, groups such as foodstuffs-chemicals are characterised by distinct product lines and relatively simple production processes thus reducing the possibility of internal transfers. Likewise, in the printing-packaging group distinct product lines occur and the existence of geographically separated divisions reduces the significance of internal transfers.

In the survey, 50 or 24%, of the 204 divisions indicated that a substantial portion of their production, between 80 and 100 per cent, was transferred to another division. Analysing these results by individual industries, four groups: forestry-pulp and paper, consumer goods-home appliances, vehicle manufacture, and textiles to a lesser degree, are significant. The

<sup>9</sup>The figures in this table represent the number of divisions in each category, not the number of companies as in Table XII.

forestry and textile groups are characterised by production which passes through several distinct stages of processing, often in different factories, before the final products are obtained. However, as will be discussed shortly, split-off products do occur at the intermediate production stages. With the other two industry groups it was indicated in Chapter I that the majority of the companies surveyed relied on a functional method of establishing divisions, thus requiring almost automatic transfer of the total production of one division to the succeeding division.

The remaining group of transfers, between 10% and 80% of output, is perhaps the most important group because of the impact that illogical transfer prices may have on the results of divisions. This group is characterised by industries such as forestry, textiles and the conglomerate retail-finance group. As was suggested earlier, both the textiles and the forestry industry have distinct production processes which may yield marketable intermediate products, each serving as the input for firms outside the organisation. Alternatively, these intermediate products may be processed further within the organisation. With the finance-retail group it is the retail section with distinct functions of manufacturing and retailing which predominates. Usually the manufacturing section undertakes some production for customers outside the organisation, resulting in only a portion of their output being transferred internally.

One of the dominant features of this aspect of the survey is the large number of companies which are involved in internal transfers as an insignificant portion of their production. This situation has led to many firms giving little or no attention to the development of "correct" transfer prices, and although this may be of minor importance at the present time, the continued growth of large integrated business units involving substantial amounts of internal transfers, will require management to consider more closely the issues involved in establishing transfer prices. However, it was discouraging to find in the survey that some of the companies which were involved in internal transfers as a considerable proportion of production gave little attention to developing and adjusting transfer prices so as to

ensure that the reports of divisions were not distorted.

#### 4.4 The Purposes of Transfer Prices:

In Chapter II the purposes of establishing reports of a division's activities were suggested to be:

(i) as an aid to division and central management for measuring the economic worth of a division's resources and how effectively the manager has used these resources;

(ii) as a guide for division managers towards making decisions which will achieve the corporate and division objectives.

If the transfer prices to be adopted are to be an aid towards achieving these purposes, it is necessary that they be established with consideration given to their suitability for each of the purposes. Table XIV illustrates the responses from twenty-six companies to a question asking for what purpose or purposes a company uses its transfer prices. Probably the most

TABLE XIV : The distribution of the purposes of establishing transfer prices.	
PURPOSE OF TRANSFER PRICE	Responses
As part of the procedure for evaluating the performance of a division	23
As a section of the system for guiding, encouraging or motivating division managers	14
To determine the final cost of manufacturing a product	21
As an aid to the making of decisions in divisions	9

significant feature of Table XIV is not the wide use of transfer prices as part of the procedure for evaluating the performance of a division, or the guidance of division managers, but rather the emphasis placed on using transfer prices to establish an inventory valuation. Coupled with this is the apparent failure to realise that transfer prices may have an important role in enabling decisions to be made both within divisions and for the whole firm, for only 36% of the responding companies indicated that transfer

prices were used for the purposes of decision-making.

To verify and extend the data presented in Table XIV a question was asked which required companies to state just how important they considered transfer prices to be for each of the purposes already listed. The replies to this question are presented in Table XV. Again it is evident that in the

PURPOSE	DEGREE OF IMPORTANCE			
	Very Important	Important	Minor Importance	Of no Importance
Evaluate division performance	13	7	3	-
Guide or motivate division managers	5	6	3	-
Valuation of inventory	15	5	1	-
An aid to decision-making	1	5	2	1

companies surveyed, inventory valuation is the most important purpose<sup>10</sup> of establishing transfer prices, for 15 out of 21 replies indicated that this purpose was "very important", and five that it was "important". Considering transfer prices as part of the evaluation process, 13 companies out of 23 considered this purpose as "very important", and 7 as "important". Although inventory valuation is an important procedure for almost all companies it should not dominate a system which is designed to fulfil other more important purposes. Several of the executives interviewed stated that cost, or cost plus a fixed percentage of mark-up, was used as the transfer price because of its convenience for valuing inventory.

<sup>10</sup> Although a smaller number of companies indicated that transfer prices were used for this purpose, than for the evaluation of divisional performance, 72% of the replies considered that transfer prices were very important for the purpose of inventory valuation, and only 57% considered that transfer prices were very important for evaluating divisional performance.

The failure of some companies to recognise that reports of divisions may be distorted by using a "convenient" transfer price, and in turn that the evaluation of divisions will be distorted, indicates a lack of understanding of the importance of a well designed system of management control and evaluation. Financial accounting and the preparation of accounts is important, but cannot be confused with a system which has much broader applications in a firm.

#### 4.5 Bases for Establishing Transfer Prices:

Transfer prices may be developed from any one of three bases: cost, market and artificial prices. Any particular price must be considered from the point of view of the purpose for which it is required, and it is intended to examine in detail the suitability of the different price bases in Chapters V and VI. At this stage, however, an indication of the extent to which each price base is used will be given. Table XVI illustrates the frequency with which each type of transfer price is used for the purposes being considered.

PRICE BASE	PURPOSE			
	A	B	C	D
Variable cost	3	2	3	2
Full cost	9	3	11	5
Full cost plus a %	7	5	6	3
Market price	10	5	7	2
Negotiated price	1	1	1	1

**KEY:** A. Evaluate division performance.  
 B. Guide or motivate a division manager.  
 C. Valuation of inventory.  
 D. Aid to decision-making.

<sup>11</sup> Because some firms did not have a single company-wide policy on transfer prices the number of observations cannot be directly compared with the 26 companies who replied to the question.

Cost based transfer prices may be interpreted to include variable cost, full cost and full cost plus a percentage mark-up. Variable cost was used by three companies as the transfer price for the purposes of evaluation and inventory valuation, whilst two relied on this particular base when considering the purpose of decision-making. The companies using this basis for evaluation relied on cost reports for divisions, and two considered the division managers responsible for variable cost only.

Full cost was used more extensively for each of the two main purposes considered, probably due at least in part to the convenience with which this price may be established,<sup>12</sup> and not necessarily because of its usefulness. Nine companies employed this price base as an aid to evaluating the performance of a division, and of these six based their divisional reports on costs alone, whilst three used a profit concept for reporting. Only eleven replies indicated that this price base was being used to establish an inventory valuation and, although somewhat surprising, it is assumed that the majority of companies using some other price base for this purpose would apply a percentage deduction to obtain the necessary cost figure. Cost plus a percentage mark-up was used by seven respondents for the purpose of aiding divisional evaluation, and in each case the firms assessed divisions in terms of a profit concept. Six companies replied that this base was used for inventory valuation purposes, but presumably applying a deduction formula to obtain the necessary cost figure for inclusion in the financial accounts.

The other major price base to be used, that of a market price, was utilised by ten of the responding firms for the purpose of aiding the evaluation of a division's performance, and in each the divisions were measured on a profit concept. For the purpose of inventory valuation, seven indicated that this price base was used. A degree of confusion existed amongst some of the executives interviewed with regard to the meaning of cost plus a

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<sup>12</sup>This form of pricing may be considered as "convenient" whenever the company concerned has an established costing system which accumulates product costs on the basis of full costing.

mark-up and market price. Because some companies establish their selling price to external customers by using cost plus a profit mark-up the replies initially suggested a heavier weighting for this form of transfer price. As these particular firms were attempting to establish their divisions as competitive economic units the aim was to use the price which existed in the market, which coincided with cost plus a mark-up. Thus the results obtained have been adjusted so that market price includes those situations where such a price is derived by adjusting the cost figure with a profit margin.

Artificially established prices occurred only once in the survey as negotiated prices. However, as will be discussed in Chapter VI, the concept of an artificial price has important implications when the transfer prices are used for certain types of decision-making.

The final stage of this preliminary discussion is to consider whether a particular form of transfer price characterises different degrees of importance in the level of internal transfers which occur. Table XVII analyses this possible relationship. The features of importance are that

PRICE BASE <sup>13</sup>	PERCENTAGE OF TRANSFER					
	< 10	11-20	21-40	41-60	61-80	81-100
Variable cost	2	-	-	-	-	1
Full cost	2	1	1	-	-	4
Full cost plus a %	2	1	1	1	-	2
Market price	4	2	2	1	-	1
Negotiated price	-	1	-	-	-	-

for companies having between 80% and 100% of production transferred, the use of full cost as a method of transfer pricing predominates, due in part to the significance of functionally organised firms. At the lower levels of transfer the market price base predominates. It is interesting to observe

<sup>13</sup>The price base adopted in this table is that employed for the purpose of evaluating the performance of the division.



that in those companies having less than 10% of their production transferred internally, four of the ten replies indicated that the market price was employed. With each of the cost concepts, two companies used this base when less than 10% of the production was transferred.

#### 4.6 Comments and conclusions:

Whenever a system of divisions is created within a business firm there exists a need to prepare reports on the operations of each division. The existence of transfers complicates the development of these reports and thus becomes an important aspect of divisional performance reporting and decision-making.

From the survey it would appear that, although internal transfers vary from being insignificant in some firms to a substantial portion of production in other firms, only a few companies have a significant portion of any division's output transferred internally. It is in these few firms that the results of divisions will be distorted considerably if an incorrect or unsuitable transfer price is adopted for a particular purpose. A number of the firms in this category have given attention to the problems of transfer pricing, as is witnessed by the group which is using marked based transfer prices. However, other firms with considerable amounts of internal transfers have failed to realise the impact which illogical transfer prices may have on divisional reports, and in turn the use being made of these reports. In the next chapter closer attention will be given to just how the prices are adjusted or applied to avoid any distortion of the division's results. For although an appropriate price base may be used, misapplication may reduce its value for the purposes for which it is intended.

CHAPTER V  
TRANSFER PRICES AND DIVISIONAL  
PERFORMANCE EVALUATION

5.1 Introduction:

In Chapters I and II it was suggested that the establishment of divisions within a firm should lead to the evaluation or reporting of these divisions' results as an aid to an evaluation of the economic worth of each division, as a guide to how well a manager has performed or used the resources of a division, and as an aid for decision-making. If, as is conceivable, any firm has different objectives at the divisional level and for the whole firm, then the method of reporting the results of both the divisions and the overall firm must be consistent with the objective established for each particular level; if compatibility between the objectives and the actions of managers is to be obtained. The current emphasis towards measuring the results of divisions from the viewpoint of costs or profit would suggest that these are important objectives, and indeed such measures, particularly profit, involve additional difficulties created by internal transfers and the need to establish prices for these transfers.

Problems of transfer pricing are usually associated only with the concept of profit centres; however, this may not be the correct viewpoint because the existence of interdivisional transfers are independent of the form of evaluation adopted, and are probably a feature more closely associated with the nature of a firm's operations and its organisation structure. Transfers into a division may be considered as a part of the costs of operating a division, or of producing its output, in a manner very similar to the external purchase of raw material inputs by any division. If this suggestion is accepted then a need exists to "price" these transferred intermediate products, whatever method of financial evaluation is used.

The purpose of this chapter is to examine the available bases for establishing transfer prices by considering some of the features and problems of employing different prices for the purpose of aiding the

financial evaluation of a division. Because of the dominant position which profit centres have in the evaluation of divisions, the emphasis will be to consider the place of each price base with regard to this form of evaluation.

## 5.2 Cost as a Transfer Price:

The concepts of cost which may be employed are numerous; however, the two most commonly used are variable costs and full costs. Each of these definitions of cost must be considered in terms of the evaluation method used in a division.

Assuming that the divisions of a firm prepare reports based only on costs, perhaps due to the fact that such divisions are not in direct contact with the external market and thus the earning of revenue, then it is possible to prepare these reports by holding the divisions responsible for all the costs incurred in producing their output. Such reports could include the purchases of raw material inputs as well as the costs incurred in the division. One additional step would be to credit any division with the output it produces and passes on to the next division, at the sum of the costs incurred, either the actual or standard. If this procedure is adopted, then a division receiving a partly processed product as an input to its processes could be charged for this input at a price which is the sum of costs already incurred, or if the division is being held responsible for the variable costs alone, then the transfer would be made at variable cost.

Chapter II examined the reasons for establishing divisional operations and one of the reasons suggested was that of evaluation. This, it was claimed, has two distinct aspects: to consider whether the division manager has utilised the resources efficiently within the limits of his control, and whether the resources of the division considered as an economic unit are profitable. Considering the first element of the evaluation procedure, the suggestion to develop cost reports which charge the manager receiving the input for the costs incurred in a prior division, may be unsatisfactory. The receiving division has little or no control over the costs incurred in previous

divisions, and therefore should not be held responsible for them.

Accounting literature contains many references to this issue, and one author<sup>1</sup> states:

"By definition responsibility accounting is a system of accounting which is tailored to an organization so that costs are accumulated and reported by levels of responsibility within the organization. Each supervisory area in the organization is charged only with the costs for which it is responsible and over which it has control."

If this particular viewpoint is accepted, then the need for transfer prices in these circumstances is diminished. However, what must be considered is that individual division managers are to some extent able to control the level of such input costs by adjusting the quantity of units acquired, by ensuring that those units purchased will be used efficiently in the conversion process, or in some firms by purchasing the inputs from an external market. A comparison could be made with the approach adopted by firms with regard to inputs purchased from outside the firm, for the usual practice is to hold the division manager responsible for this element of cost, often when his control over this cost is limited to minor adjustments of the established market price.

With the second aspect of the evaluation, the measure of a division's economic worth, the reliance on costs alone would require the costs achieved to be viewed in comparison with an acceptable or planned level of cost. In this circumstance the costs transferred in plus those directly incurred in the division would be compared with the expected level of costs, at the production level achieved. Alternatively, the inputs transferred into a division and the outputs transferred to another division could be priced at a standard cost, so that if a division incurs costs at an excessive level the cost report would show a positive balance, indicating that the particular division has not achieved its planned contribution to the final profit of the firm. However, in situations where a cost concept is used, it is not

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<sup>1</sup>Higgins, J. A., 'Responsibility Accounting', The Arthur Andersen Chronicle (April 1952).

possible to measure the economic worth of a division's resources in isolation. Only by comparison with a planned cost level or by using standard cost transfer prices may the contribution of a division towards the overall firm's result be established. As it was suggested in Chapter II any attempt to compare the economic worth of several divisions over a period of time, by using costs alone, may be impracticable since individual divisions which are not in contact with the market may not be considered as separate economic units.

Assuming, as has been outlined, that transfer prices based on some concept of cost may have a role in the evaluation phase of divisional reporting, then it is necessary to consider potential problems in applying this approach. One particular problem arises whenever a division receives a specific type of input from both a preceding division and the outside market. The impact of this is that for the same type of input, in terms of technical characteristics, two different prices will usually be paid. Provided that the percentages of the input received and used from each source are relatively stable, then only minor distortion to the results achieved in any division would occur. However, if the percentage of input arising from either source is likely to vary widely, perhaps due to production difficulties or the level of capacity available, then substantial distortion may occur. Budgeted levels of cost for any division may be developed by considering a certain ratio between each source of supply, so that any deviation from the budgeted ratio will result in the actual cost levels presenting a distorted view, caused by a factor not foreseen and probably outside a division manager's control.<sup>2</sup> Furthermore, if a standard transfer price is developed which is intended to pass on an expected level of costs to another division, this standard transfer price may either fail to pass on all the costs, or may include some fictitious costs, depending on the direction of the movement in the source of supply, thus falsely representing the contri-

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<sup>2</sup>When the division manager concerned is unable to control the quantity of internal production he must accept, then the variance will be outside his control. If, however, he is able to adjust the quantities of input he accepts from internal and external sources, a failure to maintain the budgeted mix would usually be his responsibility.

bution of either division to the firm's overall profit.

In order to reduce the impact of the distortion just discussed the introduction of a dual system of transfer prices may be considered. As the distortion arises because of the difference between the costs to manufacture, and the costs to purchase a similar input, then establishing a single price for all inputs, whether purchased or transferred into a division, should remove the distortion. The system would operate by crediting the division which produces the input with a price which represents the costs to manufacture,<sup>3</sup> thus not distorting the idea of a cost centre evaluation. However, the division receiving the input would be charged at a price which is equivalent to the cost of purchasing<sup>4</sup> a similar item from the external market. One problem could occur with a dual system of transfer prices; that is providing an incentive for a manager to continue purchasing the input internally when both sources of supply have the same price. Empirically the answer is provided in Table XII, for it clearly demonstrates that when the product is available internally most firms require that division managers purchase from this source.

When divisional reports based on costs are being considered, there may seem to be less need for transfer prices so as to facilitate the process of evaluation. However, it has been suggested that by transferring the partly completed product into the division at a predetermined price, the resulting cost statement may reflect more accurately all those costs involved in operating a particular division. Failure to make a charge for inputs which have been transferred from another division may mean that the division manager receiving these units would give little or no attention to ensuring that these units are used in the most efficient manner. Transfer

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<sup>3</sup>The cost concept to be used in establishing the price would be determined by the type of cost concept being used for the purposes of divisional reporting, and could include variable or full costs calculated on the basis of a standard or the actual costs incurred.

<sup>4</sup>The problem of whether such an item is available on an external market, and therefore whether a market price does exist, is discussed later in this chapter.

prices based on a concept of standard cost will provide a guide when assessing whether the planned level of cost, as revealed in the standard cost, has been maintained or improved by actual performance. In addition a system of transfer prices based on a concept of cost will provide an inventory valuation as an important by-product.

The use of cost based transfer prices has little or no merit in a divisional reporting system based on profit. In Chapter IV it was indicated that three companies using profit centres relied on this form of pricing, and when questioned regarding this approach the replies included:

"It is convenient for consolidating accounts and it realises that a profit is earned only when an external sale occurs",

"Avoids writing back the profit element".

The companies concerned had a total of 14 divisions and of these, six transferred more than 50% of their production to another division, whilst the remaining eight had only small percentages of production transferred. Such an approach will result in substantial distortion to the results achieved in divisions, and thus influence any assessment of how efficiently the manager has operated, and the economic worth of the resources allocated to the division. When fluctuations occur in the percentage of production being transferred, attempts to compare the performance of the division either with the budgeted performance or that achieved in a previous period will be frustrated.

Managerial control functions and those of financial accounting should be distinguished. Using transfer prices based on cost in the situation just discussed fails to recognise that, whilst the pricing method is convenient for inventory valuation and consolidation, it is of little value for management control. Where transfers are of a limited amount, perhaps less than 5% of a division's total production, the distortion which may occur is of minor importance. The existence of substantial amounts of internal transfers requires that a more realistic price be adopted. Distortion is not limited to the division initiating the transfer, as the results of the receiving division

will be influenced by the receipt of a portion of a particular input at the cost to manufacture, and the balance at the cost to purchase from an external source. The relative proportion of the input coming from each source may vary either to the division manager's advantage or disadvantage from the viewpoint of evaluation.

### 5.3 Cost "Plus" as a Transfer Price:

The initial distinction between this price base and that of cost is the addition of a profit percentage which, at least with superficial consideration, would seem to be more compatible with the profit centre concept for evaluating divisions. When the empirical application of this price is considered such a viewpoint may need to be modified.

As it was anticipated, none of the companies included in the survey used a cost plus price together with a cost centre concept of divisions. This combination would appear to be incompatible if, as is usual, a single transfer price is considered. However, it was indicated earlier that a dual system of prices may be employed.<sup>5</sup> If a division is considered as a cost centre, then the price at which the transferred products are credited to the division must be cost. The division receiving the transferred product may be charged a cost plus price whilst still remaining as a cost centre. This system would consider all the acquisitions of inputs by a division, whether internally or externally obtained, in terms which will reduce, although not eliminate, any distortion caused by changes in the percentage of a particular input derived from either source.<sup>6</sup> In turn, this would enable more effective analysis of a division's financial results whilst maintaining the desired system of evaluation.

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<sup>5</sup>The only reference to a dual system which appears in accounting literature is Greer, H. C., 'Divisional Profit Calculation - Notes on the Transfer Price Problem', N.A.A. Bulletin (July 1962) pages 5-12. This reference is concerned with measuring the cost of enforcing internal transfers, rather than as an aid to divisional evaluation systems.

<sup>6</sup>It is possible that this scheme may compound the distortion, as when the full cost is similar in amount to the external market price the addition of a percentage mark-up would mean that this price exceeds the market price.



More important is the situation of using cost plus a percentage as the transfer price when the divisions are considered as profit centres. The suitability of this method of pricing, when the purpose being considered is evaluation, will depend primarily on the nature of the percentage mark-up added to cost. Two main methods are available, either to add a fixed percentage for all divisions or to add a percentage which varies in amount depending on the division<sup>7</sup> being considered.

For the purpose of preparing divisional profit reports as the basis of performance measurement and evaluation, the use of a fixed percentage mark-up is difficult to justify. The objective of making internal sales and purchases equivalent to those involving external parties is not achieved, for the percentage added is constant and arbitrary, thus in most situations failing to represent the price for equivalent units purchased externally. Typical of percentages used by the six companies in the survey who relied on this price base, was the addition of 5%, 7½% and 10% to the cost of production. When most of these companies were interviewed, the replies from executives justifying this approach included:

"Partly for convenience as a fixed percentage is easily deducted to give the net cost of transferred products",

"Does allow some return to each division handling the product",

"Allows each division manager to realise that he is adding something to the company results",

"To give each division manager a resemblance of profit".

These comments, with the exception of the first, do indicate that the purpose of developing the divisional reports is understood. They do not, however, demonstrate that central management is concerned with the potential distortion which may occur in the results of a division, and thus in the evaluation, by using this unsuitable transfer price. Some justification

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<sup>7</sup>The percentage added may vary with the product lines being considered or by geographical areas, each of which may not coincide with a particular division.

for this approach is given in the literature<sup>8</sup> on this subject when the percentage of transferred production is small, for the degree of distortion would be insignificant and any attempt to develop a more sophisticated price base would not be warranted in cost-benefit terms. In the survey undertaken the importance of transfers between divisions in those companies using a fixed percentage mark-up is illustrated in Table XVIII. Although 36 of the

Percentage of Transfer	Number of Divisions
< 10%	36
10 - 20%	2
21 - 40%	3
41 - 60%	4
61 - 80%	1
81 - 100%	3

49 divisions, or 75%, were involved in transferring less than 10% of their production, and thus not likely to have any significant distortion to their results, there were 3 divisions with between 20% and 40% of their output transferred, 4 with between 41% and 60%, and 3 with between 81% and 100% of their production transferred internally. It is the divisions which have substantial amounts of their production transferred that are likely to exhibit unrealistic results when an arbitrary and unsuitable transfer price is employed.

An alternative approach to using cost plus a fixed mark-up is to vary the percentage of mark-up according to a pre-established set of rules, such as a desired sales margin or an acceptable rate of return on the investment in a division. Of the companies surveyed, 6 initially stated that they were using a variable mark-up on cost as their transfer price. On questioning the executives involved it was found that all except one were

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<sup>8</sup>'Accounting for Intra Company Transfers', N. A. A. Research Report 30, page 35.

using the price at which the products involved were selling on the external market, this market price being adopted from the viewpoint of these firms as a percentage added to cost. Using a variable mark-up may have substantially more merit than a fixed mark-up, if the mark-up is related to some factor such as the desired return on the investment.<sup>9</sup> However, the major consideration must be whether the price enables a valid assessment of each division's performance. The assessment may be of how effectively the division manager has used the control extended to him, or of the division considered in terms of profitability as an independent economic unit. Cost plus a percentage mark-up as a transfer price must be examined by its contribution to achieving these two purposes. Considering the division manager evaluation, this may be made by comparing how well he has performed with the budgeted profit statement for the period, or perhaps in comparison with a previous period. Using a cost plus a percentage transfer price will mean that unless the actual amount of production transferred is the same as previous periods or the budgeted statement, then the results would indicate that the particular manager has failed to achieve, or may have exceeded, the budgeted sales and profit levels. This could be caused solely as a result of a change in the percentage of production being transferred internally, a factor which, because many divisions are required to meet the demands of succeeding divisions, is outside a particular manager's control. The manager of the division receiving the transfer will be affected in the converse manner, for if he receives a greater proportion of his purchases as internal transfers than indicated in the budget, the actual dollar cost for purchases will be lower<sup>10</sup> than anticipated for a given level of production. Considering the profitability of any division as an economic unit, the assessment made would be influenced by the level of

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<sup>9</sup>The possibility that the variable mark-up is established to give a desired rate of return to the divisions is self-defeating from the evaluation point of view, as it predetermines the result which is desired.

<sup>10</sup>If cost plus a percentage mark-up exceeds the external market price the actual dollar cost for purchases will be higher than anticipated for any given level of production.

internal transfers or any changes in the percentage of production transferred. If the divisions within a firm are being compared, perhaps in terms of the return on investment, those having a larger portion of output transferred may indicate a lower return than other divisions, with central management concluding that the area of activity is less profitable. Similarly, if the comparison is made with previous periods changing percentages of transferred production could result in central management making incorrect inferences.

One approach for firms wishing to avoid this problem is to identify and separate internal and external transactions. Approximately 50% of the firms included in the survey did present the amounts of internal and external sales or purchases as distinct items in divisional reports. Although this would provide useful information when considering the performance of any division, few if any attempts were made to isolate a division's activities into external customers and internal transfers, a procedure necessary for assessing correctly the reported results.

#### 5.4 Advantages and Problems of Cost-based Transfer Prices:

Whether cost, or cost plus a percentage mark-up, is being considered, several claims have been suggested to support this form of transfer price, most of these claims being made without regard to the purpose which the transfer price should be assisting. One of the most commonly asserted advantages is that of convenience. This cannot easily be denied, but it is necessary to consider the possible consequences associated with this convenient price base. There are few difficulties in establishing a cost for each unit of output, when a suitable cost accounting system exists, nor is there any problem in deciding upon an arbitrary percentage to add to this cost figure. However, this price, although convenient and useful for inventory valuation and some types of decision-making, is of little value in assisting the evaluation of divisions. When either a variable or a fixed percentage is added to cost any division involved is guaranteed recovery of

its costs, plus a profit element. It is claimed by Dean<sup>11</sup> "that the company is assured of an adequate profit on the entire process if transfer prices at each stage force the addition of a profit". The important question to consider when attempting to evaluate the worth of a division is whether by guaranteeing a margin of profit for each division, the aim of establishing divisions as autonomous economic units is necessarily being fulfilled. Clearly it is not.

One problem of particular importance when cost or cost adjusted transfer prices are used, is the revision of the cost figures used as transfer prices. Nineteen companies replied to a question which asked whether standard or actual costs were used as the basis for establishing transfer prices. Allowing for three replies which indicated that both were in use, there were 16 firms using standard cost, and 6 actual cost. Most of those using actual cost, when interviewed, indicated that production for internal transfer was on an irregular batch basis and not as a part of the usual production run. For example, one company produced intermittently a small quantity of output to be sold through its retail outlet, another used a large irregular production run to achieve economies by spreading the set-up costs over a greater number of units.

More interesting is the group of companies using standard costs, for during periods of fluctuating prices and costs the existence of a stable transfer price will have an impact on the reported results of both divisions involved in a transfer. Thus the length of the period separating revisions of the transfer price is an important influence in determining the likely impact of the intervening cost changes on the reported results of the divisions. Table XIX indicates the distribution of review periods for the 16 companies using a "standard" transfer price. Considering the companies using profit centres for reporting the results of divisions, then the use of annual review periods combined with "standard" transfer prices could mean that substantial changes in costs would not be passed on to the

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<sup>11</sup>Dean, J., 'Decentralisation and Intracompany Pricing', op. cit., page 70.

TABLE XIX : The distribution of review periods for standard transfer prices.		
Period of review	Number of observations	
	Cost centres	Profit centres
Monthly	2	1
Six-monthly	1	1
Annually	1	4
No established period	-	3
Not available <sup>12</sup>	3	1

division receiving the transferred products. Although annual reviews were adopted by four companies, and no established review period by three companies, when the seven companies concerned were interviewed, four stated that adjustments were made whenever major cost changes occurred. It is interesting to note that no formal structure existed requiring a certain percentage change in cost before the transfer price would be adjusted; rather the pressure from individual division managers appeared as the important reason for alterations to the existing price.

Regular adjustments to "standard" transfer prices do create difficulties, as division managers could be in a position to include in the price adjustment both those cost increases arising from their inefficiency and those caused by a change in the external environment outside their control. The first type of charge should not be included in the adjustment, for the division receiving the transferred products should not be penalised for a previous manager's inefficiency. Such cost changes could not normally be recovered when trading with the external customers and thus should not be recoverable on internal transactions. Any changes in costs which arise in the external environment would probably affect all the firms operating in a particular industry and be recoverable by an adjustment to the market price. No division manager should be penalised by being unable to adjust his transfer price in the same way as the external market price is adjusted.

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<sup>12</sup> As the data for this table was obtained from selected interviews supplementary to the questionnaire, not all those companies replying that they used a standard form of price were able to be questioned concerning the review period used.

### 5.5 Market-based Transfer Prices:

Attempts to establish divisions as profit centres, able to be considered as autonomous operating units, requires that the price a division receives for selling its output to another division, and the price the purchasing division pays, are equivalent to the price at which the same transactions could be effected with an external party. For the purpose of aiding divisional performance evaluation this price base removes most of the distortion which arises as a consequence of using any cost price base. Not only is it possible to compare more readily past and present periods profit results, but comparisons with budgeted levels of performance and even interdivisional evaluation become more feasible.

5.5.1 Although authors such as Cook,<sup>13</sup> Menge<sup>14</sup> and Shillinglaw<sup>15</sup> agree that this method of pricing is the most appropriate for profit centre evaluation, some doubt is expressed regarding its application. Initially the difficulty of determining whether a market price does exist for the product being transferred is important, as the existence of such a price is a necessary prerequisite to its use. This particular problem has two related aspects:

- (i) whether a market is available from which a substitute product may be purchased, or on which the product could be sold;
- (ii) whether a market which does exist is a "real" alternative for the divisions.

Table XX indicates the degree of availability in the external market of a firm's intermediate output. The replies are limited to those companies using a profit centre concept for divisional results; however, it is demonstrated that of the 19 replies, the output from intermediate divisions was always available in the external market in 7 firms, and frequently available in 9 firms. Such a pattern of results does indicate, at least in the

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<sup>13</sup>Cook, P. W., op. cit., page 87.

<sup>14</sup>Menge, J., 'Backward Art of Interdivisional Transfer Price', Journal of Industrial Economics (July 1961) pages 215-232.

<sup>15</sup>Shillinglaw, G., 'Cost Accounting : Analysis and Control' (R. D. Irwin Inc. 1967) page 829.

TABLE XX : The availability of an external product equivalent to a division's output.						
Availability	Percentage of Transfer					
	< 10%	11-20	21-40	41-60	61-80	81-100
Always	2	2	2	1	-	-
Frequently	5	2	1	1	-	-
Sometimes	-	-	-	-	-	1
In a few cases	-	1	-	-	-	-
Never	-	-	-	-	-	1

companies surveyed, that an external source is frequently available from which a market price could be obtained for most internal transfers. Furthermore, the sample of companies who replied to the questionnaire confirms the availability of alternative sources of supply for in no industry group was there only one firm; in addition, scanning national industrial statistics will verify the existence of many units in each industry group.

It has been suggested that the lack of an available market price does not prevent the use of a price which reflects a "notional" market.<sup>16</sup> In any firm it would be possible, by using engineering, time and motion, and cost studies, to develop a cost figure likely to occur in firms producing different quantities of a product type. To this hypothetical cost figure a percentage of profit could be added which reflects the rate of return expected in the particular industry group. Developing an artificial market price in this manner does merit consideration, for it is effectively producing a long-run industry price which is devoid of short-term demand and supply influences. One argument against this approach is that it prevents individual managers negotiating prices to obtain discounts, and although this is correct the same argument may be applied when considering the use of a true market price. Similarly, it could be argued that the frequency with which the data must be updated, and the costs of providing the information to undertake the calculations, may reduce the application of a "notional" market price.

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<sup>16</sup> Cook, P. W., op. cit., pages 87-94. Having established this price, Cook proposes a system of compulsory internal trading to avoid the influence of short-term price changes.



The second question of whether the market is a real alternative for any particular division or firm must be considered by analysing at least two variables, the quantity and quality of units available in the market. In those industry situations approaching an oligopolistic state it is suggested in economic literature that the quantity of product made available by, or demanded by, a single firm may substantially change the price in the market. Thus it follows that if a division of a firm was to shift its demand for one of its inputs from another division to an external firm, this alteration in the equilibrium of the industry would create a price change. Such a viewpoint is implicit in Solomons<sup>17</sup> and is explicitly stated in Dean,<sup>18</sup> who suggests:

"The volume traded in the market may be so small compared with intra-company transactions that an attempt to get supplies from there would drive the price up."

This may, however, misinterpret the situation. If it is assumed that the product concerned is not unique in terms of quality, or perhaps the time of availability, then the transfer of a division's output to the external market, instead of another division, should not be the cause of a market price change. Although a temporary excess of supply over demand or vice versa will occur, this must be resolved when the other division involved in the internal transfer enters the market to purchase its input, or alternatively to dispose of its output. Purchasing from the market, or selling to the market, does not alter the total quantity of product supplied to or demanded from the market and therefore should not be the cause of a change in the market price, except in the short run disequilibrium period.<sup>19</sup>

The discussion this far has ignored any differences in quality which

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<sup>17</sup> Solomons, D., op. cit., page 178.

<sup>18</sup> Dean, J., 'Decentralization and Intra-company Pricing', op. cit., page 69.

<sup>19</sup> For any particular firm the extent of the market price movements when a division enters the market, either to buy or sell units which were previously transferred internally, will depend on the size of the firm in relation to the market and the elasticities for supply and demand which exist in the market.

may occur between the intermediate output of different firms. For although the product arising as the output of several firms may be described as physically identical, minor variations in processing or quality standards could restrict the extent of the market for either disposal or acquisition of a particular type of output. Greer<sup>20</sup> states that even in a market as extensive as the U. S. A. problems may arise for -

"Unhappily the applicability of the method (market price) is severely limited by the absence of dependable market price quotations on a majority of industrial products".

Undoubtedly this tendency will continue as large vertically integrated units, manufacturing a wide range of products, continue to emerge. Firms with these characteristics will produce their intermediate products not oriented towards any external customer but towards further internal processing. Consequently the methods of processing adopted will create output which has unique quality features of a specific brand name ideally suited to the particular productive system of a firm, and the completion of production at the lowest overall cost. Available market prices will only have meaning when they refer to a particular product, with a specific set of quality characteristics, which are equivalent to the quality characteristics desired by the company being considered.

One additional factor, the availability in terms of time, of the product being considered, will influence the suitability of a market price. The output being produced by the firms constituting an industry would be available in different quantities at varying time intervals. The firm or division desiring to purchase from the market has a particular pattern of production so that it will demand a product in a unique quantity-time combination. Only the production available on the market which meets the individual firm's unique requirements can be considered as being ideally suited for this particular firm, and worth the full market price. That production which is available at different quantity-time combinations would

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<sup>20</sup>Greer, H. C., op. cit., page 8.

result in the firm having to meet additional storage or production costs and thus have another specific, but lower, market price or value to the particular firm.

The existence of a market price for many products will, for some of the reasons discussed, be difficult to determine and may not be available in the form of established price schedules. Determination will in many situations require individual firms to call for quotations from external parties. However, once again these quotes may not reflect a market price, for not only may the firms preparing the quotations represent only a small percentage of the available sources, the quotations supplied may be unreal. Many parties preparing quotes would, perhaps as a result of previous experience, realise that the firm concerned has little or no intention of purchasing its requirements externally, and only wants to establish a price for internal transfers. Consequently the quotation provided may not represent the competitive price to a genuine purchaser. From the viewpoint of the firm asking for the quotations, two factors may discourage them from adopting this procedure for establishing transfer prices. The first concerns whether the calling for quotations when there is no intention of accepting one of them, can be described as an ethical business practice. More important is the second factor, that of secrecy, as the calling of quotes requires the revealing of designs and production plans to parties who are potential, if not actual, competitors.

5.5.2 Another problem relating to the use of a market price for internal transfers is deduction from the market price of an amount to recognise the lower packaging, transportation, selling and servicing costs generally associated with internal transfers. In the survey undertaken, the 10 companies using a market price revealed the following policies towards adjustments to the market price:

An adjustment is always made	...	2
Frequently an adjustment is made	...	5
Only in a few divisions is the market price adjusted	...	3

Adjustment to Market Price	Percentage of Transfer					
	< 10	11-20	21-40	41-60	61-80	81-100
Always	5	2	3	1	1	1
Frequently	21	1	1	-	-	2
In a few divisions	14	1	3	4	2	6

Table XXI extends the analysis by considering the number of divisions existing in each transfer percentage group for different policies towards adjustment. Perhaps the most interesting feature is the low percentage of divisions, 17% of the observations, involved in internal transfers which always have the market price adjusted. The failure to always adjust the market price may be justified in those situations where the percentage of production transferred is small; however, the table does not reveal this feature. Twenty-five divisions, or 38% of the observations, came from the companies which frequently adjust the market price used for internal transfers; however, as a substantial majority of these divisions have less than 10% of their production transferred, the possible level of distortion is limited. This, however, does not apply with those firms who adjust the market price only in a few cases. Divisions in these firms constitute 45% of the observations and 16 of the divisions have between 11% and 100% of their production transferred. Thus, for many divisions in this group, considerable distortion may occur to the reported results. Such distortion may be removed by an attempt to measure the differences in costs which occur as a consequence of internal trading.

In Table XXII the two methods of adjusting the market price, namely an arbitrary basis and using some knowledge of the packaging, transportation, service and selling costs, are considered in relation to the percentage of production transferred. Of the divisions involved in transfers at a market price, 72% have the relevant market price adjusted with some knowledge of the differing costs. This is particularly important when the

Basis for Adjustment	Percentage of Transfer					
	<10	11-20	21-40	41-60	61-80	81-100
Arbitrary Knowledge of costs	11	2	3	1	-	2
	29	2	4	4	3	7

group includes most of those divisions having substantial portions of their production transferred, and thus are more likely to be affected if an arbitrary adjustment was made.

The limited sample just outlined does indicate that firms involved with internal transfers do have a desire to ensure that valid comparative data is made available for divisional evaluation. Important, however, is the method of evaluation to be undertaken, for this may give an interesting insight into just how the adjustments should be made. At least three reasons exist for the adjustment and these are:

- (i) to enable a comparison of all divisions within a firm, whether they trade internally or externally;
- (ii) to enable a single division to be compared with any other firm operating in the same industry group;
- (iii) to facilitate the comparison of a single division's actual performance with that in a budgeted statement or that achieved in previous periods.

A comparison across several divisions would be important if an assessment of each division's economic worth or profitability is required. In such a circumstance each division must have its costs or revenues adjusted so that no advantage will accrue merely because of the extent of internal or external trading undertaken by a particular division. Many other factors, probably of greater importance, will influence the degree of comparability between the divisions. For example, divisions operating in different industry groups may perform differently as a consequence of particular

industry characteristics. Alternatively, within a single industry group, divisions having varying production capacities, and therefore cost structures, will limit the validity of any comparison. It is factors such as the two just outlined which must, if possible, be adjusted to enable any complete comparison to be undertaken.

When the adjustment to the transfer price is to facilitate a comparison with other firms, the adjustment to the market price may be the only one required. For the firm is attempting to measure the profitability, or economic value, of a division if it were to operate under market conditions. A recent survey of transfer pricing practice in the U. S. A. isolated two cases where division managers proposed additional adjustments to the transfer price, both reflecting divisions with higher cost structures than other firms in the industry group, as a result of smaller capacity and the inability to replace outdated capital equipment. The decision provided in these situations was:

"The primary objective of the intra-company pricing system is to provide a means of measuring performance against known competitive levels, competitive practice with regard to costs and price must be followed."<sup>21</sup>

If the purpose of the adjustment is to assist the evaluation of how well a division manager has performed in comparison with budgeted results or those of a previous period, the adjustment to the market price will only be required if a change in the division's operations has occurred. Unless the division is transferring a different percentage of its output than was anticipated when developing the budget, or compared with a prior period, no adjustment to the market price is required. The comparison will not be distorted by failing to adjust the market price, as this non-adjustment will have the same impact on the results anticipated in the budget or for a past period, as it has on those achieved in the current period. Thus, although the report may be of limited value for assessing the economic

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<sup>21</sup>Whinston, A., 'Price Guides in Decentralized Organizations' in 'New Perspectives in Organization Research' (J. Wiley & Son, New York, 1964) pages 414-416.

worth of the division, the efficiency of a manager in using the division's resources may be appraised in an acceptable manner.

Discussion in the earlier section concerning the use of cost concepts as transfer prices indicated that using actual cost or an adjusted standard cost, could result in the inefficiency of one division being included in the transfer price, and consequently penalising a succeeding division. Using a market price as the internal price base prevents this cause of distortion, but does not exclude the possibility of distortion arising from the use of a "standard" market price. Of the 10 companies using a market price for transfers, 8 were interviewed; 6 indicated that a standard form of market price was used which in all cases was adjusted to recognise major changes in the market price, whilst 2 used an actual market price due largely to the irregular nature of the transfer. Although no attempt was made to determine the meaning of "major cost changes", it is probable that, as with the adjustments to standard cost data, pressures from individual managers would initiate a change in the transfer price.

The application of a market price to internal transfers has an important role in evaluating divisions by a profitability measure, for only with this price base are divisions considered as autonomous units, equivalent to independent entities. Two aspects, the establishment of an available market and in turn a market price for the products being transferred, and the need to adjust the market price to recognise different costs associated with internal transfer, present major difficulties in applying the market price concept. However, those firms who consider the correct evaluation of divisional results to be of importance are able to overcome most of the problems associated with using the market price concept by applying some of the procedures discussed.

#### 5.6 Artificial Transfer Prices:

Using transfer prices which have no close relationship to a cost or market base except by accident, but rather rely on negotiation between the

division managers, or an optimisation model<sup>22</sup> to derive the transfer price constitute the group of artificial prices.

Empirically the use of negotiated prices is limited, for in the survey undertaken only one company used this form of transfer pricing. In this firm the quantity of internal transfer was only a small percentage of the production and the transfers were on an irregular cycle. As the transfers involved the transportation of the product into areas where the demand could not be met by the local division, much of the negotiation concerned the allocation of transportation costs and profits between the two divisions making the transfer.

Accounting literature<sup>23</sup> gives little evidence of support for negotiated prices, partly because it is expensive in terms of executive time, but also because it relies on the ability of an individual manager to bargain. As a result the price obtained may reflect the personal strength of a particular manager, or the position a division has in relation to the other divisions in a firm. This view is supported by the following statement:

"At Kaiser we now use a cost system rather than a negotiated system for transfer prices, since we believe that interdivisional transfer price staff work and arguments can represent one of the purest forms of overhead. Moreover it does not follow that as a result justice will necessarily be done. We have also found that these discussions and arguments under a negotiated system are not always a meeting of equals on the battleground of the free enterprise system, but rather are affected by personalities and by corporate positions."<sup>24</sup>

In those situations where a market price does not exist to guide division managers, the knowledge which managers have of their cost structures may enable them to bargain towards a price which reflects a satisfactory return for each division.

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<sup>22</sup>This aspect is discussed in depth in Chapter VI.

<sup>23</sup>Cook, P. W., op. cit., page 93. Greer, H. C., op. cit., pages 5-12.

<sup>24</sup>Dearden, J., 'The Case of the Disputing Divisions', Harvard Business Review (May-June 1964) page 174.



Dean<sup>25</sup> supports the use of negotiation for establishing transfer prices as this is the only method which considers division managers as "arm's length parties", thus preserving a greater degree of autonomy. Although the agreement between managers may reduce the friction which could occur with other pricing methods, Dean considers that both parties must have access to all the information on alternative sources and markets, as well as having the freedom to operate in a market outside the firm. The empirical evidence presented in Table XII indicated that only a few firms extend a significant amount of control to division managers over the selection of their source of purchase or market for disposing of output, thus the requirement that access to external markets exists may be unfulfilled. In addition, this suggestion of Dean would limit the use of negotiated prices to those situations where a competitive market is available, whereas the most important role of this price base should be in those situations where no external market exists.

If the possibility of an alternative external market is accepted, then the degree of negotiation must be limited to deciding to what extent either party is to benefit from the reduced costs of internal transfer. What must also be realised is that the existence of an external market limits the negotiating power of the division receiving the transferred products. For example, in a two-division firm the first division A is able to dispose of its intermediate product on the market at \$12, but to do this incurs an additional \$2 of costs which relate to the external sale. Thus division A would be indifferent between selling its output on an internal market and an external market if a transfer price of \$10 is obtained. At any price greater than \$10 an internal transaction would be preferred. Division B is willing to purchase its input from either Division A or the external market if the two prices are identical, for it is unlikely to incur additional costs which are peculiar to internal or external trading.<sup>26</sup> Purchasing from the

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<sup>25</sup> Dean, J., 'Decentralization and Intra-company Pricing', op. cit., pages 65-74.

<sup>26</sup> The possibility of having to meet transport and associated costs of external purchases does exist.

external market will cost division B \$12, so that any internal transfer priced at an amount less than \$12 will be the preferred alternative. Consequently, division A may offer its product to division B at an amount approaching \$12 and be assured of a customer. By following this action division A earns approximately \$2 a unit more as a result of internal trading.

When an external market does exist the negotiated transfer price will be unacceptable, and in those situations where no market exists the bargaining power of each party will be conceptually more equal, however practically this may not be the position. Should the firm be attempting to maximise a profit concept, the use of this price base may cause production delays as managers attempt to negotiate a price from their division-oriented viewpoint. Only by establishing a time period for negotiation and frequency of adjustments may this be overcome. In addition, if the price is to aid the purpose of evaluation, no assistance would be given to judging the profitability of each division as this will be largely determined by the position of strength held by the managers involved. Any attempt to gauge how well a division manager has performed is limited to a measure of his negotiating ability which may not reflect his ability to manage an operating division of a business firm.

Division managers who are required to negotiate the transfer price may undertake a strategy consistent with the theory of games.<sup>27</sup> This approach would enable a manager to define the strategies which are available to himself for the quantity, price and source of an input, or conversely, an output he completes. For each possible strategy his opponent or opponents would adopt a particular strategy which, when combined, will yield a pay-off for each party involved in the game. As the policy of each manager may, in this pricing situation, be to maximise his expected profit or income, the strategies available must be considered against the possible opposing actions available to his opponent. Depending

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<sup>27</sup> Shubik, M., 'Incentives, Decentralized Control, the Assignment of Joint Costs and Internal Pricing', *Management Science* (April 1962), pages 325-343.

on the attitude of a division manager towards the risk of achieving either a large profit or perhaps a loss, the action of a manager will differ. For example, he may adopt a "safe" strategy, so that no matter what action his opponent takes a reasonable profit will be obtained.

The concept of applying a games theory approach has some theoretical merit as it will encourage a better understanding by each manager of his possible courses of action. Any attempt by a division manager to formulate a games theory model which will guide his strategy when negotiating a transfer price has several empirical difficulties. Perhaps the major problem is a lack of information which may prevent a particular manager from determining all the strategies which are available to his opponent. In a situation where no market appears to exist for the intermediate product, either manager, unknown to the other, may have a few sources or customers for the intermediate product. Thus a single division manager would not be in a position to include this possibility in the games theory model. Even if a limited external market is known to exist, but without an established price, the division manager attempting to purchase the intermediate product, or the manager attempting to sell his intermediate output, would be unaware of the quantity available or demanded by the external market, nor the price at which such a transaction would occur. Consequently, a division manager could not determine the complete range of strategies available to his opponent if an offer to purchase a given quantity of the intermediate product at a particular price is made. The existence of a third player in the game, for example, central management, further limits the possibility of developing the required model. Central management may retain the right to alter the transfer price if it is considered inequitable, so that some of the possible strategies available to each division may produce results which are unacceptable to central management. These strategies would not be isolated until a price is developed and made known to central management. Factors such as these prevent the establishment of the possible strategies which each party may undertake, and without these strategies determining the pay-off or reaction of an opponent is

impossible in these circumstances.

#### 5.7 Concluding Comments:

The existence of identifiable divisions within a business firm, each being granted a degree of autonomy, which enables them to be considered as semi-autonomous entities, creates a need to evaluate the performance of each division manager, to assess the economic worth of each unit and to provide a guide for decentralised decision-making. As the structure of the individual firms differs it is necessary to use different methods of evaluation with cost and profit being the predominant methods of evaluating performance in financial terms and assessing the economic worth. Problems usually arise when applying either a cost or a profit concept; however, these problems are compounded by the need to price internal transfers.

Pricing internal transfers is usually associated with the concept of profit. However, it is possible, and perhaps desirable, to price internal transfers when a cost concept of reporting is employed. This then enables the internal transfers to be priced equivalent to external purchases of inputs, and with the aid of a dual system of prices, limits the possible distortion to the results obtained. As a side benefit, pricing the transfers in these situations will provide an inventory value for partly and fully completed products, to be included in the financial accounts.

Employing a profit centre concept presents additional problems because of the need to price internal transfers so that the division selling the intermediate product receives a profit element on transaction. The method which may be considered as most satisfactory is an adjusted market price, for this equates the price of the transfer with the price existing in an external market, thus removing most of the distortions to the results of each division, which arise from internal transfers. As the empirical data has demonstrated, some New Zealand companies involved with internally transferring production ignore the possibility of distortion and rely on cost

plus a percentage mark-up or a negotiated transfer price. Users of this price base consider that convenience for the purposes of financial accounting outweigh the needs of an accurate system for evaluating divisional performance. In addition, they fail to consider that any system of relating incentives to divisional performance will be distorted by using illogical transfer prices.

Although the sample of companies using a market price base was limited to ten, the additional empirical data presented does show that the policies of these firms, and the desires of a theoretical system, are very similar. Most of the group adjusted the market price by using a knowledge of the cost differential between external and internal sales, thus ensuring that divisional results are meaningful for the purposes of evaluation.

This chapter has been devoted to finding an "ideal" transfer price for divisional evaluation and how this price may be applied in practice. Chapter VI is concerned with analysing how this ideal price and the other price bases discussed may be used as an aid to effective decision-making at divisional and corporate levels.

CHAPTER VI  
TRANSFER PRICES AND DECISION-MAKING

6.1 Introduction:

Previous chapters have emphasised the need to establish transfer prices which will ensure that the results achieved in the divisions of a firm are not distorted, and in turn that division managers' performance and the profitability of a division are correctly evaluated. Only passing reference has been given to the second purpose of establishing divisional results, stated in Chapter II, to provide a guide to decision-making at both corporate and division levels. The transfer price adopted will have an important impact on the manner in which a particular decision is undertaken, requiring that the price be considered in relation to a given type of decision.

Ideally the price adopted for internal transfers should be compatible with a system of divisional reporting, which provides both a measure of divisional performance and a guide for decision-making. It is with this aim that the transfer prices available must be reconsidered.

In Chapter II it was suggested, both from a theoretical viewpoint and as a result of the empirical information collected, that full cost and controllable or traceable, or net profit are the most acceptable methods of measuring the financial results of divisions. When considering the transfer prices for decision-making it will be essential to consider the impact a particular price may have on the application of these methods of measuring divisional results.

Much of the emphasis in the literature<sup>1</sup> on the establishment of transfer prices for decision-making has been concerned with the maximisation of both divisional profit and corporate profit as a result of a division manager's actions. Assuming that the division manager has as an

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<sup>1</sup> Hirshleifer, J., 'On the Economics of Transfer Pricing', op. cit. ; 'Economics of the Divisionalized Firm', The Journal of Business (April 1957). Arrow, K. J., 'Optimization, Decentralization and Internal Pricing in Business Firms' in 'Contributions to Scientific Research in Management', op. cit., pages 9-18.

objective the maximisation of his own profit level, whilst the firm as a whole has an objective of profit maximisation, then some degree of conflict may occur between these objectives unless each division manager is given the appropriate guidance perhaps by using a suitable transfer price.

This chapter will be directed towards the establishment of transfer prices which will enable the co-ordination of divisional activities so as to maximise the profit results for the individual divisions and for the overall firm. Two distinct situations exist, the first where the output of an intermediate division is demanded by only one other division and the productive capacity is sufficient to meet this demand. The second situation occurs when more than one division competes for the intermediate output of a preceding division, and the available capacity must be allocated amongst the competing demands.

## 6.2 Marginal Analysis:

In this situation a relatively simple method of analysis relying on classical micro-economic theory of the firm is used to establish the transfer price for exchanges between the divisions of a firm. The analysis will be limited to considering two examples which illustrate how the transfer price will be derived in these circumstances. In the first example there is no external market for the intermediate product being transferred, whilst the second assumes such an intermediate market exists. Both rely on a purely competitive situation in an economic sense, and although this is artificial it does not necessarily restrict the value of the analysis.

6.2.1 The absence of an intermediate market for the partly processed output requires that all divisions within the firm co-ordinate their output levels, in all periods other than the very short run.<sup>2</sup> For the firm as a whole, the best or optimal output level will occur when the sum of the marginal costs incurred in each division is equal to the price for the final

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<sup>2</sup>In the short run any of the divisions may not be co-ordinated with the production levels in other divisions by either using up previously held inventory or by building up inventory from current production.

product in the external market.

To illustrate this situation a vertically integrated firm with two divisions, perhaps one producing and the other distributing, or each carrying out a stage in the productive processes, may be considered. If, as was suggested in the previous section, the firm operates in a purely competitive final market, then Figure 1 represents the firm. At an output

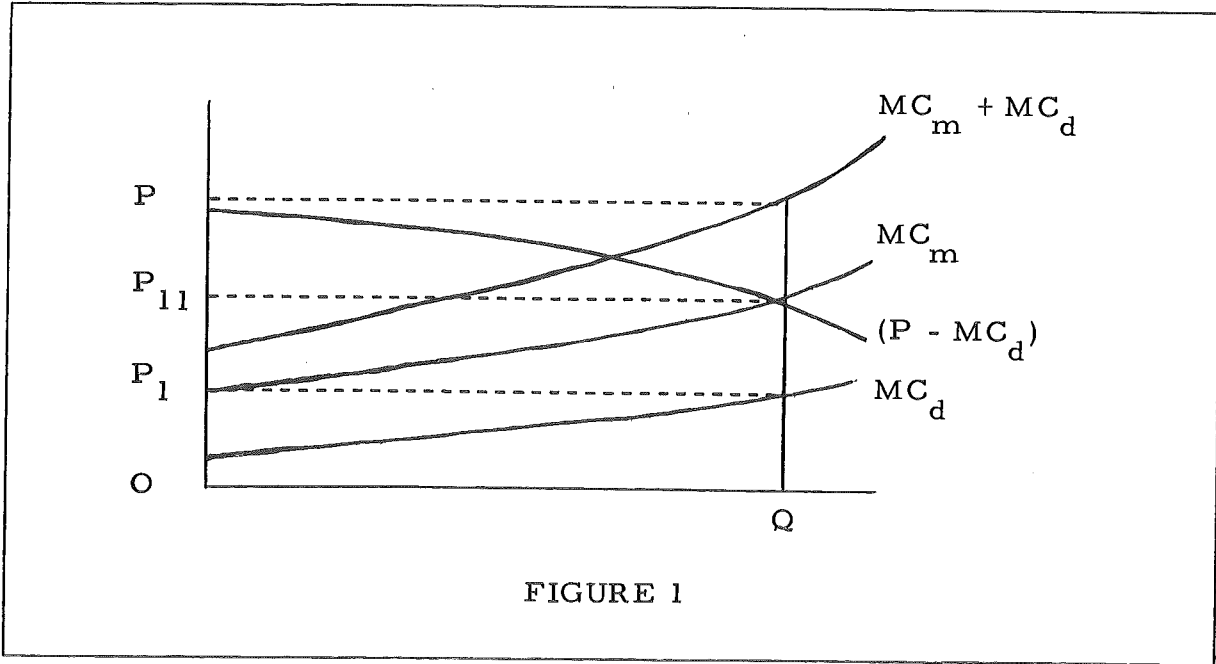


FIGURE 1

of  $OQ$  units, and a price in the final market of  $OP$ , the optimal profit situation is obtained for this firm. Given this level of optimal output, a transfer price must be established to ensure that each division operates at the same output level. At output level  $OQ$  the manufacturing division would be willing to "sell" its output to that the transfer price is equal to, or greater than, the marginal cost of producing the last unit. If the transfer price adopted is greater than  $MC_m$  this division will not be at its best possible output level and would move to a production level higher than  $OQ$ . By equating the marginal revenue curve of the manufacturing division with its marginal cost curve, at the optimal output level for the firm, a transfer price of  $OP_{11}$  is obtained. For the distribution division, the price at which



it will purchase the transferred input must be such that  $(OP - OP_{11}) \geq MC_d$ , thus at a transfer price of  $OP_{11}$  and an output level of OQ the distribution division will achieve an optimal solution, for at this point the marginal revenue curve at height  $OP_1$  and parallel to OQ and the marginal cost curve  $MC_d$  will intersect. At an output level less than OQ the optimum point for the firm would not have been achieved as  $MC_m + MC_d$  is less than OP.

Achieving a joint level of optimum output for the divisions and the firm would suggest that the degree of autonomy granted to each division manager must be reduced, and indeed it may be necessary for each division to be informed of its output level by central management. It has been suggested<sup>3</sup> that the central management may supply to each division a possible transfer price, and the divisions must state their levels of production and purchase which will equate the marginal cost and the transfer price for each division. This declared transfer price would be adjusted until the output and purchases proposed by the divisions are equal. Alternatively, one of the divisions may be granted the decision-making authority to ensure that the output levels are co-ordinated. For example, the manufacturing division may request that the distribution division state its demand for the transferred product at a range of transfer prices. Assuming that the distribution division wishes to achieve an optimal position it would be prepared to purchase at a transfer price shown by the curve  $P - MC_d$  in Figure 1. This would reveal to the manufacturing division the shape of the marginal cost curve for the distribution division, enabling it to establish an output level where the marginal cost curve for the manufacturing division intersects the curve  $P - MC_d$ . At this point the optimal output level for the firm is obtained.

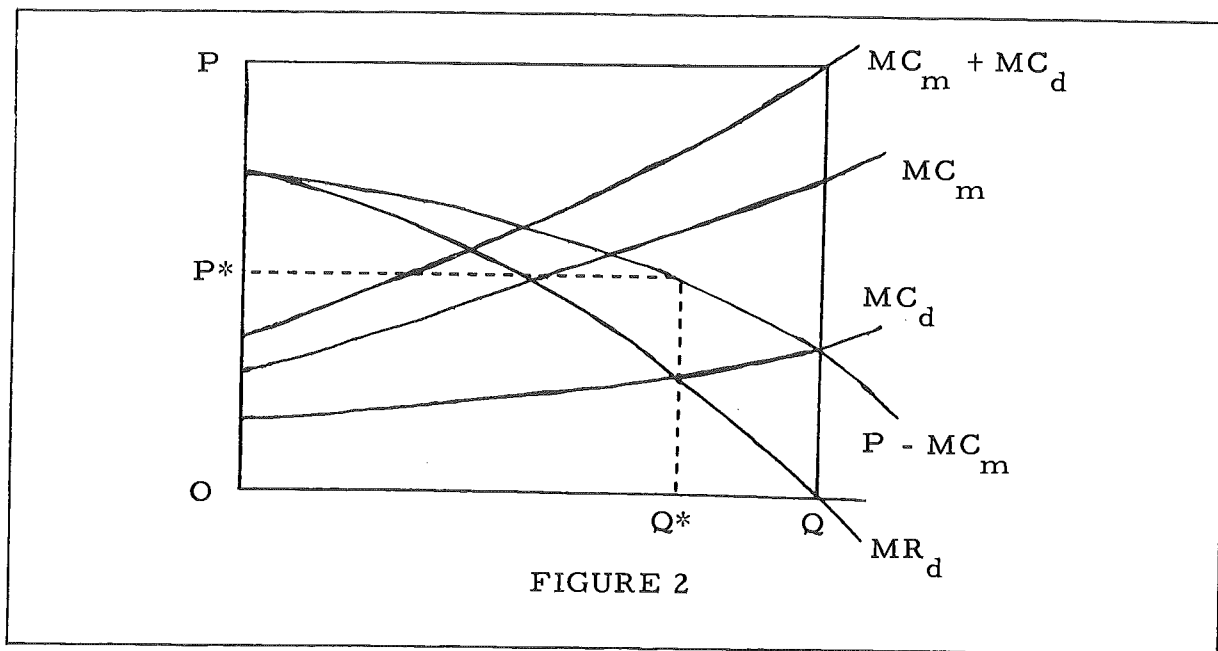
Although the approach outlined may suggest the retention of autonomy by division managers, this is not correct. Each division manager is able to select his output level given a particular transfer price. However, given

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<sup>3</sup>Hirshleifer, J., 'Internal Pricing and Decentralized Decisions' appearing in 'Management Controls'. Bonini, C., Jaedicke, R. and Wagner, H. (Editors) (New York : McGraw Hill, 1964) pages 27-37.

that a cost structure exists in a division and the desire to maximise the results achieved in the division, the choice is notional and could equally well be made by central management if the necessary information was available. In addition, the choice is further limited as central management or one division manager will effectively establish the production level for each division by adopting the transfer price which maximises the overall firm profit level and requiring the divisions to maximise their own performance within the constraints of an established price and cost structure.

There is no guarantee when a manager must provide information to the predominant decision-making division, or to central management, that the information will be accurate. For example, a division may falsely represent the nature of its marginal cost curve so that the transfer price obtained will, in the case of the manufacturing division, be higher; and if the distribution division misrepresents its cost curve, be lower than an optimum solution would provide, thus establishing a lower overall output level for the firm than the true optimal result requires. Similarly, it is possible for the distribution division to act as a monopolistic buyer, or the manufacturing division to act as a monopolistic seller of the intermediate product. The effect of such action will be to improve the results of one division whilst the firm will not operate at an optimal output level. Figure 2 illustrates the impact of the distribution division acting as a monopolistic buyer of the intermediate product. Using this position the manufacturing division can be forced to accept a transfer price which follows the line  $P - MC_m$ , the net average revenue curve for the distribution division. This division maximises its profit position by accepting the intermediate output only until the marginal cost curve,  $MC_d$ , and the marginal revenue curve,  $MR_d$ , for the division intersect. Thus output is established at  $OQ^*$  and the transfer price is lower at  $OP^*$  resulting in a non-optimal position for the firm as a whole.



6.2.2 Following the method of analysis just outlined, it is possible to postulate the existence of an external market for the intermediate product. This market may be considered as either purely competitive or non-competitive in an economic sense whilst the market for the final product is assumed to be purely competitive.<sup>4</sup>

Each of the two divisions must be considered separately, for in this situation the external intermediate market may be considered as an alternative outlet for the manufacturing division, or an alternative source of acquisition for the distribution division. Under these conditions the likelihood of both divisions having the same level of supply or demand is low, as each will be able to operate at a level so as to achieve its own optimum position.

Figure 3 demonstrates that the manufacturing division will produce to an output  $OQ$ , where its marginal cost curve  $MC_m$  is equated with the market price for the intermediate product,  $OP_1$ . The distribution division will continue to "purchase" the intermediate product until the sum of the

<sup>4</sup>If a non-competitive market is assumed for the final product the analysis is more complex and outside the purpose of this section. Hirshleifer, op. cit., discusses these issues in considerable detail.

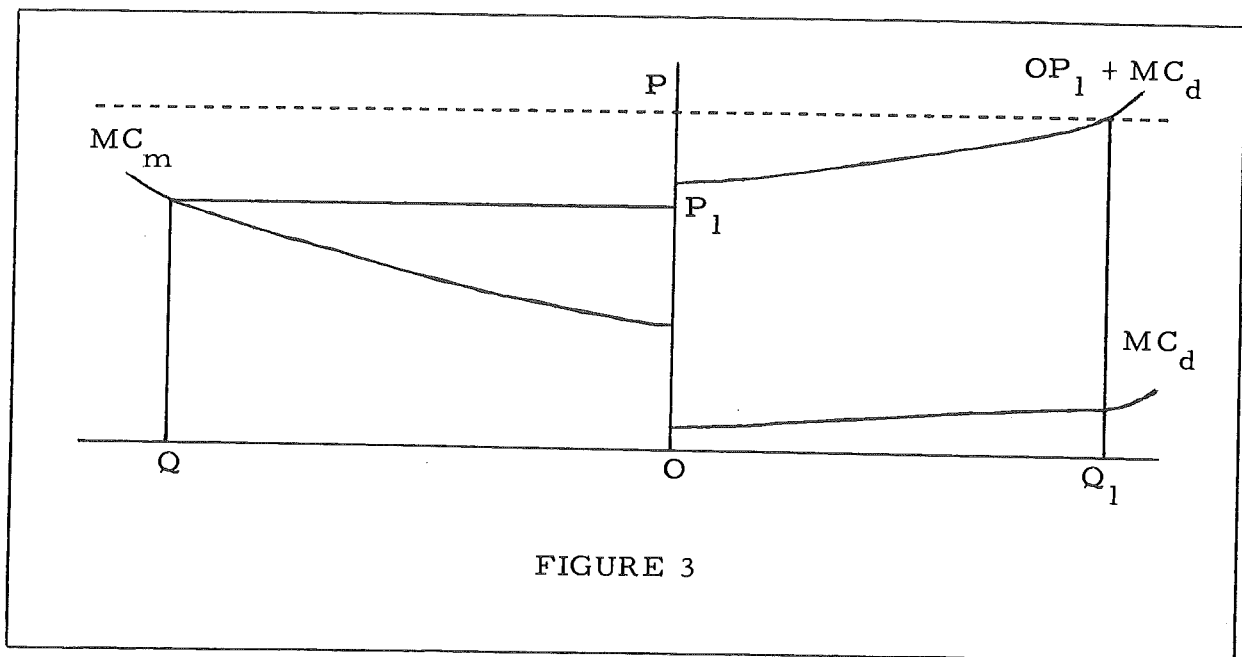


FIGURE 3

transfer price  $OP_1$  and the marginal cost curve for the division,  $MC_d$ , is equal to the price in the final market  $OP$ : this intersection occurs at output  $OQ_1$ . If  $OQ$  exceeds  $OQ_1$  the surplus from the manufacturing division will be sold on the external market for the intermediate product, whilst if  $OQ_1$  exceeds  $OQ$ , the distribution division will purchase its additional requirements from the external market.

The availability of an external intermediate market enables each division to act autonomously thus achieving the optimal position for the division, and with the same action the optimal solution for the whole firm. As the transfer price will be the market price the systems of performance evaluation already discussed will be applicable. Two features are of interest in this particular analysis. If the division managers do not have the right to buy and sell on the external market, then the existence of such a market is irrelevant. The transfers would have to occur at a price which will ensure co-ordinated levels of supply and demand by each division. The second issue concerns the cost of operating on the external market. It has been assumed in this simplified analysis that there are no additional costs incurred as a result of operating on the market. However, in a more realistic situation, each division will incur costs such as insurance,

packaging and transportation. In an analytical study of this feature, Gould<sup>5</sup> demonstrates that because of the differences between the price to buy, the price to sell on the external intermediate market, and the transfer price if no external trading is permitted, it is not possible to assert that any one of these versions of a "market price" will lead to an optimum firm solution.

Analysis in those situations where an external intermediate market exists, provides an interesting example of the dependence between the divisions of a firm. This dependence may be in any one of three forms proposed by Hirshleifer:<sup>6</sup>

- (i) Demand dependence,
- (ii) Cost dependence,
- (iii) Technological dependence.

Considering demand dependence, it is probable that some degree of dependence will occur between the output of each division<sup>7</sup> because of the difficulty of completely segmenting the market into customers for the intermediate product and those for the final product. As a consequence, an increase in the external sales of the intermediate division will reduce, rather than complement, the sales of the final division. This will mean that the additional intermediate sales are being made at the expense of the final division and probably the overall firm. So as to prevent the division producing the intermediate product from undertaking action which will be detrimental to the firm, central management may have to implement a system of penalties<sup>8</sup> to ensure that the optimum solution for the firm is achieved by individual managers following adjusted courses of action.

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<sup>5</sup>Gould, J. R., 'Internal Pricing in Firms when there are costs of using an outside market', *Journal of Business* (January 1964) pages 61-67.

<sup>6</sup>Hirshleifer, J., 'Economics of the Divisionalized Firm', *op. cit.*, pages 172-184.

<sup>7</sup>The extent of dependence will probably differ between vertically integrated firms and those horizontally integrated.

<sup>8</sup>Hirshleifer, J., 'On the Economics of Transfer Pricing', *op. cit.*; 'Economics of the Divisionalized Firm', *op. cit.*, pages 100, 101. Arrow, K. J., 'Optimization, Decentralization and Internal Pricing in Business Firms' in 'Contributions to Scientific Research in Management', *op. cit.*, page 15.

Cost and technological dependence are closely related, so that the existence of one will probably mean the other form of dependence exists. As with demand dependence it is likely that horizontally integrated firms will be affected to a greater degree by these forms of dependency. The solution to achieve an overall optimum position for the firm is to use bonus and penalty adjustments to ensure that the actions of a division are compatible with overall requirements for maximisation at the total firm level.

Systems of penalties or bonuses would operate by adjusting either the unit price being used for internal transfers, or to adjust directly the profit results of the divisions involved. If the dependency between two divisions results in an increase in the level of output or sales of one division, reducing the number of units which may be sold by the other division, a charge may be made against the profit of the former division. Similarly, if a division, by incurring a higher level of cost, reduces the level of cost in another division, the former division may receive an increment to its profit. Alternatively, the approach would be to adjust the transfer price by an amount sufficient to offset the impact of any dependency between the divisions on a particular division

The aim of considering this simple, and to some extent artificial, analysis was to outline the origins of systems of transfer prices established to guide resource allocation towards an overall optimum for the firm. Without a market for the intermediate product a joint level of demand and supply based on the marginal costs of each division must be established. In those situations where an intermediate market does exist, the possibility of dependency between the transferring divisions creates difficulties in the establishment of an optimal transfer price. These problems, although difficult to solve in a simple situation, are of much greater importance whenever constraints on the available capacity exist, and competing demands for the intermediate product occur.

### 6.3 Constrained Capacity:

In those situations where a division manager faces only one party demanding his output, the absence of a market does not prevent the establishment of transfer prices to aid in developing an optimal solution for the firm. Each division manager will, given a particular transfer price or final market price, continue to produce or purchase units until his marginal cost curve intersects the marginal revenue curve; that is, until the opportunity cost for the particular division is zero. Likewise, when an external market exists for the intermediate products a particular division manager will continue to purchase or manufacture until the opportunity cost is zero, at this output level the marginal cost of producing the final unit will be equal to the marginal revenue received, in this situation the market price.

When competing demands exist for the intermediate product, and the capacity available is limited, the opportunity cost to be considered when allocating a scarce resource to one type of output is the net difference between the marginal costs of producing either output type and the difference between the revenues obtainable from manufacturing the marginal unit of each output type. A single division manager could allocate his available capacity amongst the competing demands, so as to maximise his return from this capacity.

The more important situation occurs when the scarce resources may be used for several types of output, thus prohibiting a single manager from deriving an optimal solution. Mathematical programming procedures offer a method of allocating the scarce facilities to the production of units, so as to ensure that the best possible profit is earned for the firm. It has been shown<sup>9</sup> that the application of these techniques may have relevance to the establishment of transfer prices, which enable a firm to optimise its profit as a result of guiding division managers in the allocation of resources to

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<sup>9</sup>Baumol, W. J., 'Economic Theory and Operations Analysis', op. cit., pages 103-128. Charnes, A. and Cooper, W., 'Management Models and Industrial Applications of Linear Programming' (New York : John Wiley 1964) pages 288-368.

various types of output.

It is possible that the activities of the firm may be co-ordinated by operating as a centrally controlled firm, with the central management informing division managers of the levels of production for different output types. However, throughout this thesis the importance of decentralised decision-making has been a recurring feature and it is the combining of decentralisation with an optimal solution for the firm that requires transfer prices to be derived under these circumstances. The derivation of these prices can only be undertaken with the aid of programming procedures,<sup>10</sup> for without these the relevant opportunity costs cannot be obtained.

6.3.1 The method of deriving prices with the aid of mathematical programming as a guide for decentralised decision-making involves the solution of two related problems, the primal and the dual.<sup>11</sup> In most firms there is produced a wide range of outputs by the conversion of inputs, and the application of scarce fixed resources. As each product may utilise different scarce resources, the available resources will be "used up" to a differing degree with various possible combinations of outputs. Likewise, each type of output may contribute a different amount towards the profits of the firm thus resulting in certain feasible combinations of outputs yielding better profit results for the firm. A simple linear programming model for allocating the scarce resources and achieving a maximum profit result consists of relationships between the profit contributions per unit of output, the usage each output type makes of the scarce resources, and the amount of each scarce resource available for usage. Generalised, the model may be represented as:

$$\text{Maximise } Z = a_{00} + a_{01} X_1 + \dots + a_{0n} X_n \quad (i)$$

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<sup>10</sup> Solomons, D., op. cit., pages 218-221, presents an illustration of this situation without the aid of mathematical programming. However, the example is limited in its realism.

<sup>11</sup> It is not intended to examine the techniques of mathematical programming except so far as is required to illustrate the derivation and significance of the prices.



$$\text{Subject to: } t_1 = a_{10} + a_{11} X_1 + \dots + a_{1n} X_n \quad (\text{ii})$$

$$t_2 = a_{20} + a_{21} X_1 + \dots + a_{2n} X_n \quad (\text{iii})$$

$$\vdots$$

$$t_m = a_{m0} + a_{m1} X_1 + \dots + a_{mn} X_n \quad (\text{iv})$$

$$t_1, t_2, \dots, t_m \geq 0 \quad (\text{v})$$

$$X_1, X_2, \dots, X_n \geq 0 \quad (\text{vi})$$

With  $X_1 \dots X_n$  being the output types or variables,  $t_1 \dots t_m$  the physical amount of each constraint or scarce resource available, for example floor-space, machine hours or storage capacity, thus there will always be a positive or zero amount of each constraint available. The contribution per unit of output to the firm's net profit is designated by  $a_{00} \dots a_{0n}$ , whilst the quantity of scarce resource used up by each type of output is represented by  $a_{10} \dots a_{mn}$ .

One of the widely used methods for solving this model and obtaining the "best" levels of output is known as the "simplex" approach. In outline this method uses a series of steps to find that particular combination of different outputs which employs the scarce resources so as to maximise the profit function. By considering any point where two of the constraint equations (ii), (iii), (iv), will intersect, it is possible to determine the quantities of each scarce resource being employed to produce the variables or output types ( $X_1 \dots X_n$ ). Moving from this point to the intersection of another pair of constraint equations the number of positive variables ( $X_1 \dots X_n$ ) is increased whilst reducing the number of positive slack variables ( $t_1 \dots t_m$ ), i.e. unused amounts of scarce resource, thus ensuring a greater usage of the scarce resources. With each iteration the coefficients of the variables  $a_{00} \dots a_{0n}$  and  $a_{10} \dots a_{mn}$  will be recalculated to provide new profit contributions and usages of the scarce resources. After a series of steps the simplex method will yield an optimum solution

as one where the profit is maximised and each coefficient of the variables in the objective function (equation (i)) are non-positive. This is optimal as it indicates that the contribution of the marginal unit of output to the firm is either zero or negative. Should such coefficients be positive the firm could earn additional profit by producing further units yielding a positive contribution to the net profit.

For the purposes of establishing transfer prices the dual model is of greater importance as it represents the scarce resources in monetary terms rather than the physical units employed in the primal model. The dual model is of the form:

$$\text{Minimise } L = a_{10} V_1 + a_{20} V_2 + \dots + a_{m0} V_m$$

$$\text{Subject to: } a_{00} = a_{11} V_1 + \dots + a_{1n} V_m - S_1$$

$$a_{01} = a_{21} V_1 + \dots + a_{2n} V_m - S_2$$

$$\vdots$$

$$a_{0n} = a_{m1} V_1 + \dots + a_{mn} V_m - S_n$$

$$V_1 \dots V_m \geq 0$$

$$S_1 \dots S_n \geq 0$$

With  $S_1 \dots S_n$  the dual slack variables,  $a_{10} \dots a_{m0}$  the capacity constraints,  $V_1 \dots V_m$  the accounting values imputed to each unit of scarce resource, or the marginal contribution to the profit of the firm which would occur if the available units of each scarce resource were increased by one,  $a_{11} \dots a_{mn}$  are the quantities of resources required for each type of output. Thus in any of the constraint equations

$$a_{00} = a_{11} V_1 + \dots + a_{1n} V_m - S$$

$$\vdots$$

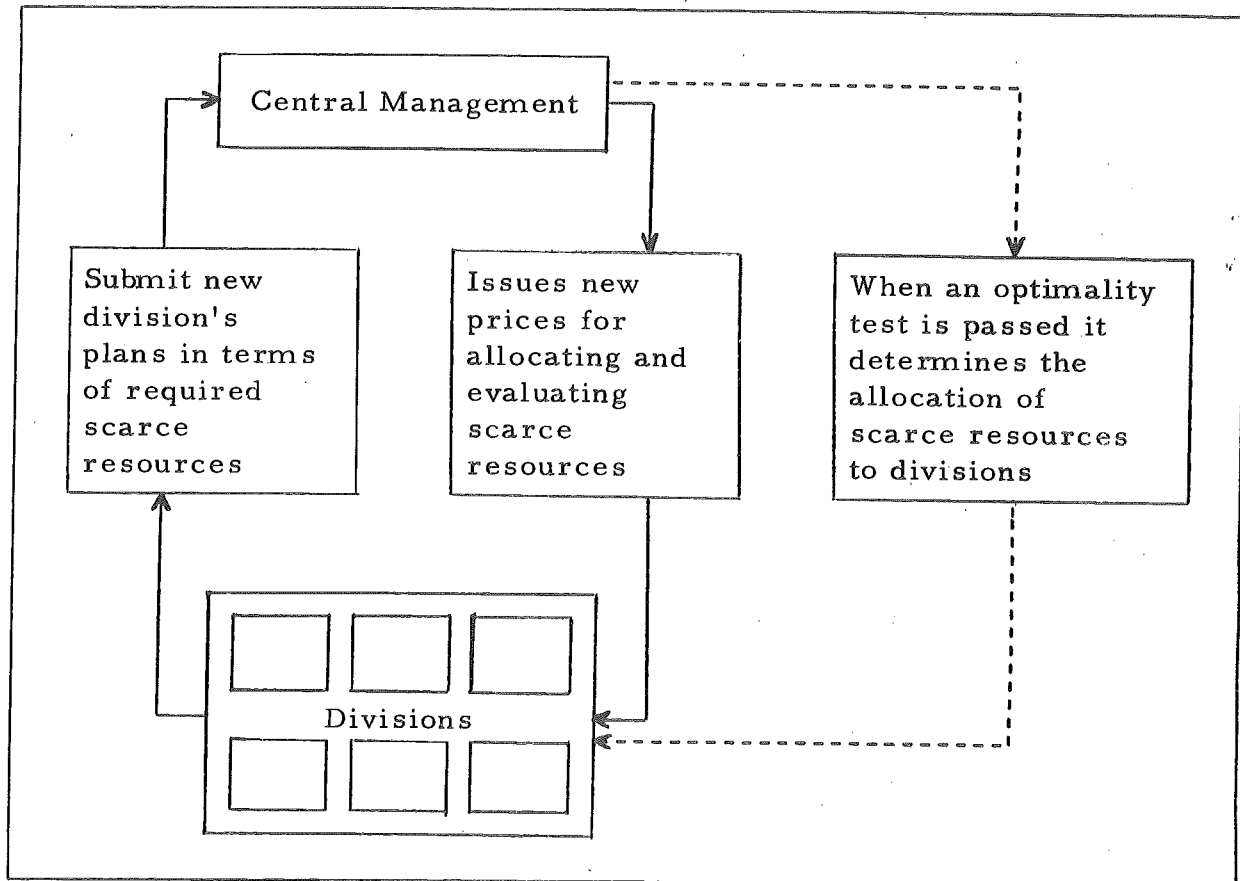
$$a_{0n} = a_{m1} V_1 + \dots + a_{mn} V_m - S_n$$

if  $V_1 \dots V_m$  represents the profits imputed to, or the "value" of each scarce resource, and  $a_{11} \dots a_{mn}$  the quantities of each resource used in producing the types of output, then  $a_{00} \dots a_{0n}$  represent the total value of each unit of output.

The accounting values  $V_1 \dots V_m$ , commonly referred to as "shadow prices", represent the addition to the firm's profit which could occur if another unit of a particular scarce resource was made available. In an optimal solution only those types of output which yield a profit per unit equal to, or greater than, the dual values of the scarce resources used will be produced. With such a solution the output valued by shadow prices exactly equal the dual values of the resources employed. Any other solution would not produce an output which when valued by shadow prices recovers the sum of the dual values of the scarce resources used to manufacture the output.

This particular method of analysis rests on several assumptions which may reduce the validity of the technique. For example, the objective function and the constraint equations are assumed to be linear, thus excluding the possibility of increasing or decreasing returns to scale, and requiring the contribution to profit by each unit of output to be constant. If in any situation the functions appear to be non-linear the application of a non-linear method of analysis is required. Although more complex to apply, non-linear programming attempts to obtain an optimal solution and thus is closely related to the approach already discussed. The second assumption is that the constraints are common to all activities within the firm. To overcome the possibility that some constraints may be peculiar to a given division of the firm, and others common to all the divisions, a technique of dividing the model into sectors or activities has been developed. This particular model may have interesting applications in decentralised organisations.

6.3.2 The "decomposition principle"<sup>12</sup> is the procedure for dividing up the firm into segments, and it obtains its name from the process of decomposing the programming model for the firm into a series of sub-models which will facilitate the manipulation of data, thus achieving an optimal solution. Diagrammatically the decomposition procedure operates as illustrated below:<sup>13</sup>



<sup>12</sup> Dantzig, G. and Wolfe, P., 'The Decomposition Algorithm for Linear Programs', *Econometrica* (October 1959) pages 767-777; 'Decomposition Principle for Linear Programs', *Operations Research* (January-February 1960) pages 101-111. Baumol, W. and Fabian, T., 'Decomposition Pricing for Decentralisation and External Economies', *Management Science* (September 1964) pages 1-32.

<sup>13</sup> From Farag, S.M., 'Input-Output Analysis : Applications to Business Accounting' (Illinois : Centre for International Education and Research in Accounting, 1967) page 109.

Essentially this method recognises that individual divisions of a firm will be subject to a particular set of constraints, and the whole firm will be subject to constraints which are common to all divisions. For example, the types and amounts of finance available may be a constraint affecting the whole firm and in turn each division. Likewise, a particular division may be constrained by the capacity of the machines it operates and although this will restrict the level of operations for the whole firm it will not directly influence the operations of other divisions. For example, consider a firm consisting of two divisions, division 1 producing outputs  $X_1$ ,  $X_2$ ,  $X_3$ , and division 2 producing  $Y_1$ ,  $Y_2$ . Each division has constraints, perhaps the machines available, and these are designated for division 1,  $C_3$ ,  $C_4$ ,  $C_5$ , and for division 2,  $C_6$ . Both divisions are subject to common or corporate constraints denoted  $C_1$ ,  $C_2$ , and these may be limited capital available and warehouse storage space. The problem may be formulated as:

$$\text{Maximise } P = P_1 X_1 + P_2 X_2 + P_3 X_3 + P_4 Y_1 + P_5 Y_2$$

$$\text{Subject to: } a_{11} X_1 + a_{12} X_2 + a_{13} X_3 + a_{14} Y_1 + a_{15} Y_2 \leq C_1$$

$$a_{21} X_1 + a_{22} X_2 + a_{23} X_3 + a_{24} Y_1 + a_{25} Y_2 \leq C_2$$

$$a_{31} X_1 + a_{32} X_2 + a_{33} X_3 \leq C_3$$

$$a_{41} X_1 + a_{42} X_2 + a_{43} X_3 \leq C_4$$

$$a_{51} X_1 + a_{52} X_2 + a_{53} X_3 \leq C_5$$

$$a_{64} Y_1 + a_{65} Y_2 \leq C_6$$

$$\text{with } X_1, X_2, X_3, Y_1, Y_2 \geq 0$$

so that some of the constraint equations include only X variables, some only Y variables and the remainder both X and Y variables, that is, common constraints.

Initially each division is requested to solve its own linear programming problem, having regard to its own objective function and its own constraints. The production plans obtained by each division are submitted to the central management, together with the profit coefficient of each element of the objective function.<sup>14</sup> As the divisions will derive their solutions without regard either to the possible impact on other divisions, or the feasibility of the solution when the corporate or common constraints are considered, central management may be required to adjust the proposed solutions to ensure overall feasibility. This is completed by constructing an artificial programme or an "executive" programme.<sup>15</sup> The executive programme consists of the objective function, as indicated earlier, the common constraints and one constraint equation<sup>16</sup> for each division. With each iteration towards obtaining the optimal firm position, the executive programme is solved to yield from the dual problem a set of dual prices for the corporate resources. Dual prices are usually derived only after the optimal primal problem has been obtained. However, in applying the decomposition principle they are calculated for each tentative solution forwarded by division managers. These intermediate dual prices are used to adjust the divisional profit coefficient for each type of output so that the quantity of corporate resource used up by a particular output type multiplied by the dual price for this corporate resource is deducted from the profit coefficient in the divisional objective function. This adjusted profit coefficient is the net worth to the firm of each unit of output for the current feasible solution. Such a deduction is necessary to recognise the opportunity

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<sup>14</sup> See equation (i) Maximise Z ... on page 97 supra.

<sup>15</sup> Baumol, W. and Fabian, T., op.cit., pages 7-14.

<sup>16</sup> The constraint equation for each division includes an element for each divisional output type and applies a weighting to the levels of output the division determines. After a division has sent several feasible solutions of its own programme to central management, each set of output levels forwarded will be weighted into the constraint equation for a particular division. By this procedure the successive solutions offered by division managers will more closely approximate the company-wide optimal solution.

cost to the overall firm of a division acting in isolation and using a portion of the corporate scarce resources to obtain its solution.<sup>17</sup>

When the adjusted profit coefficients are obtained each division manager must use these to resolve his linear programme. Although he will be using this adjusted information he must maximise his objective function, again without regard to other divisions or the corporate result. The solution to the division's programmes will be used to resolve the executive programme with the readjusted profit coefficients being conveyed to each division manager. For any division there will be a finite number of feasible solutions which may be tendered to the central management. With each proposal the units of output are weighted together with the previously proposed levels of output, thus increasing the profit result for the firm so that the optimal solution for the firm is more closely approached after each proposal submitted to central management and analysed with the aid of the executive programme. The optimum is achieved when the profit coefficients of each division's objective function, adjusted by the "executive" programme, are employed to resolve the programme for each division and to yield new profit coefficients equal to the dual prices derived for each divisional constraint equation in the most recently solved executive programme.

6.3.3 In this section on using mathematical programming to derive shadow prices, it has been shown that those situations in which resources are scarce, a solution may be derived which will yield an optimal profit for the firm and thus satisfy one important objective - profit maximisation. Such a solution may, in the case of centralised firms, be applied by instructions being issued to sections of the firm stating the levels and types of output to be produced. In larger organisations where it is desirable to

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<sup>17</sup> Decomposition enables the penalties and bonuses associated with inter-divisional relationships to be established in a formal and systematic method. The deduction from the profit coefficient is equivalent to the type of adjustment referred to on page 95, supra. However, this deduction is derived from the executive programme and is more accurate than the adjustments referred to by Hirshleifer.

retain a degree of autonomy for decision-making in each division, the optimal solution may be attained by the use of prices derived from the dual solution, which will guide division managers towards the "best" combination of outputs. As one group of authors<sup>18</sup> has suggested:

"Many firms especially large ones, operate on a rather decentralised principle. In such firms, accounting or control prices are established by a central planning authority . . . and the individual department heads are expected to do as well as they can in light of those prices. Decentralised administration of this type has many advantages, but it is important to note that its success depends upon the establishment of proper accounting prices . . . we have now seen that linear programming can be used for this purpose."

However, it must be realised that with this system the division managers will in reality be no longer making the decision regarding levels of output, for if the managers are being rewarded or evaluated on the basis of a profit concept<sup>19</sup> or how well the scarce resources have been employed, only one combination of output exists which will produce the best possible result in any division. Thus, although the division managers are completing the calculations to establish their output levels this notional operation could, given adequate information, be successfully carried out by central management and conveyed to the division managers, thus avoiding an artificial decision-making process.

It could be further argued that the existence of shadow prices as a basis for establishing transfer prices reduces the autonomy of division managers, by preventing them establishing their own transfer prices. Although correct, this does not differ from the situations cited in earlier chapters, where division managers were informed that transfers must occur at market price, cost plus a certain percentage mark-up, or at full cost, and only in one company surveyed was the right to negotiate a transfer price

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<sup>18</sup> Dorfman, R., Samuelson, P. and Solow, R., 'Linear Programming and Economic Analysis' (New York : McGraw Hill, 1958) page 184.

<sup>19</sup> As will be discussed shortly, the optimal solution will yield a "break even" point and not a profit as the dual prices are derived so as to use up the profit contribution of each unit of output. Any non-optimal solution will result in a "loss" for the division.



delegated to the division managers.

Extending the usual linear programming method to allow division managers to retain their autonomy to a greater degree, has been outlined as the decomposition principle. In the circumstances for which this method is appropriate it is considered that each division manager may concentrate on optimising the performance of his division alone, and act only in the interests of a particular division. Instead of being told the shadow prices attaching to the use of scarce resources, the manager is negotiating with central management for the shadow price and the levels of output. What this fails to recognise is that no division manager acting solely in his own interests will achieve the optimal firm solution. Consequently the procedure of submitting the plans of the divisions to central management for recalculation of the profit coefficients, in light of the usage being made of corporate resources, must be considered as invalidating the so-called divisional autonomy. One author states:

"In the final analysis the output decisions are made and enforced by the central planner<sup>20</sup> ... There is no automatic motivation mechanism which will lead division managers to arrive at such a combination of outputs of their own volition. In this way, the decentralisation permitted by decomposition breaks down completely at this point."<sup>21</sup>

For although the division manager is solving a series of linear programming models relating to his own division, he is required at each step of the calculation to use some input data, provided and calculated by the central management.

These methods of establishing optimal output levels although reducing the autonomy of division managers do enable resource allocation decisions to be made by considering prices which are relevant to such decisions rather than relying on cost plus a mark-up, market price or negotiation, each of which may be costly to the firm, as a consequence of being irrelevant for

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<sup>20</sup>Baumol, W. and Fabian, T., op.cit., page 2.

<sup>21</sup>Ibid., page 14.

establishing the levels of output and profit maximisation. However, a considerable degree of decentralisation is still possible, and indeed desirable. It will be necessary for division managers to collect the data relating to input prices and sources, and for output demands and prices, for this information is essential for the construction of a centralised planning model. The division managers will be able to use their own knowledge and skills to select in the most economic manner the combinations and sources of inputs, as well as the distribution of outputs. Furthermore, the set of decisions affecting the internal operations of a division will be decentralised and thus the responsibility of individual division managers for controlling the operations of their divisions will be maintained.<sup>22</sup>

#### 6.4 Divisional Evaluation and Optimal Transfer Prices:

The most important issue which arises out of an attempt to employ a centrally derived solution for the firm's outputs and in turn to utilise a system of transfer prices to guide decentralised decision-making, is the method of evaluating division managers which may be applicable. In particular, is the earlier suggestion that either a cost or a profit concept would be the most appropriate, still valid?

Two distinct situations exist. With the first a market is available for the intermediate product, whilst the second offers no alternative external intermediate market. Wherever a market for the intermediate product is available it was suggested that the existence of two or more divisions competing for output from the available limited capacity, or a single division demanding the intermediate output, required the use of a market price for valuing internal transfers. This is because the market price represents the opportunity cost to the firm of one division deciding to trade externally. Using this transfer price would enable divisions acting autonomously to make decisions which are in the best interest of the firm,

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<sup>22</sup> This procedure is analogous to that of budgetary control where the planning will be undertaken by a group of divisional and central managers whilst the individual division managers will have the responsibility of ensuring that the plan is implemented and achieved.

and will guide the firm towards an optimal profit level. Furthermore, such prices will in no way invalidate the use of a profit concept for performance evaluation. If, however, dependencies exist between the divisions involved in a transfer, perhaps in the form of jointly used productive facilities or related demands, the use of the market price to guide resource allocation will be inappropriate. Even though a market may exist for the transferred product, this may not even approximate the opportunity cost to the firm of making the transfer.

The second situation, where no intermediate market exists, requires the opportunity cost concept for transfer pricing to be interpreted as marginal cost when there are no competing demands for the resources, and when competing demands do exist, the scarce nature of the resources requires the price to be derived from the dual or shadow price. In these circumstances the procedures for division manager evaluation become more complex and a simple profit or cost index may be insufficient.

It has been suggested<sup>23</sup> that the application of a marginal cost transfer price still enables a profit concept to be employed. This is based on the assumption that the marginal cost curve of the supplier division is upward sloping, so that at the given level of output, i. e. where marginal costs and marginal revenues are equated, the transfers will all occur at the marginal or incremental cost of producing the last unit. This means that for all units of transferred product, with the exception of the final one, the transfer price will exceed the marginal cost of production. Thus each unit will be contributing an amount towards the fixed costs of the division and, depending on the nature of the fixed costs, contributing towards a divisional profit figure. Such an argument for justifying the use of a profit system of evaluation is tenuous for it requires that:

- (i) The marginal cost curve is upward sloping. Empirical evidence has shown<sup>24</sup> that the more likely situation is an almost constant marginal

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<sup>23</sup> Solomons, D., *op. cit.*, page 195.

<sup>24</sup> Dean, J., 'Managerial Economics' (Englewood Cliffs : Prentice Hall, 1951) pages 291-296.

cost curve; thus divisions would not recover any portion of their fixed costs or achieve a profit margin.

- (ii) The extent of the fixed costs in any division is such that any increment included in the transfer price, in addition to the marginal costs, will fully recover the fixed costs.
- (iii) Either or both the marginal cost curve and the fixed cost structure will not change as the result of a cause lying substantially outside the division manager's control.

These factors suggest that any attempt to apply a profit concept will be unsatisfactory and a system of evaluation reflecting the division manager's control over the cost elements in his division would be more appropriate. The difficulty is that the manager is required to produce to a production level determined by the transfer price and he may have only minor control over the level of costs incurred. His control, and in turn evaluation, should be undertaken by a comparison of the planned and achieved cost levels for the optimal production plan.

When considering the more important situation of competing demands for the limited resources, it will be essential to design an evaluation system using a concept other than profit. Division managers will be charged at dual values for the use they make of the scarce corporate resources, as well as being responsible for the variable costs incurred in their own division for producing the output. The transfers will therefore be priced at the combination of the quantity of scarce resources employed to produce the output, measured by the dual values, and the variable costs incurred for each type of output. Thus, only when the division manager uses the scarce corporate resources he has "purchased" in an optimal way, will the charge by central management for such resources be recovered in the transfer price of the output, and a break even point reached.<sup>25</sup> With any non-optimal use of the resources the division manager will record a "loss". The reporting of either "profits" or "losses" in relation to the optimal break even point

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<sup>25</sup> This aspect was referred to on page 105 supra, and occurs because the imputed or dual value of the scarce resource is exactly equal to the contribution of the output units to the firm's net profit.

may have important behavioural implications. If the division managers participate in establishing the optimal plan, it is likely that the managers will accept the optimally derived plans as their aspiration levels.<sup>26</sup> Any manager who fails to achieve his aspiration level is likely to reduce his future aspiration level<sup>27</sup> and may become less receptive to any optimally derived plan which is established. If, however, division managers consider that the procedure of negotiating with central management is nothing more than pseudo-participation,<sup>28</sup> they may not accept the optimal plan as their aspiration level and thus may not work towards this level of achievement.

One difficulty with using transfer prices established as the dual values of the scarce resources plus the variable costs per unit of output, is the treatment of the variable costs. Should they be included in the transfer price at the actual level incurred or at some predetermined standard? As it was argued in Chapter V, using an actual cost figure would enable a division manager to pass on inefficiencies to a division purchasing his output. Applying a standard concept to the variable costs to be included in the transfer price will avoid this difficulty, and provide a measure of the division manager's efficiency, for if the actual variable costs incurred are greater than the standard cost amount included in the transfer price, a "loss" or a variance will occur in the particular division's performance report.

Using the shadow price system of transfer prices would mean that if a manager operates as anticipated when the overall optimal plan was developed and the variable cost standards were established, he will achieve a zero "profit" figure, as the charges for the use of scarce resources and

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<sup>26</sup>This view is expressed in Becker, S. and Green, D., 'Budgeting and Employee Behaviour', *Journal of Business* (October 1962) pages 392-402.

<sup>27</sup>See Stedry, A. C., 'Budget Control and Cost Behaviour' (Englewood Cliffs: Prentice Hall, 1960).

<sup>28</sup>This term implies that although the division managers participate in preparing the plan, their role is a passive one. See Argyris, C., 'Human Problems with Budgets', *Harvard Business Review* (January-February 1953) pages 97-110.

the variable costs incurred will be just recovered in the transfer price of the output. This form of evaluation may be utilised by a comparison between the planned and actual usage of resources to produce given amounts of output over a number of accounting periods. For in any period, the extent to which the results obtained deviate from a zero "profit" figure, will indicate how closely the division manager has approximated the planned optimal use of resources and variable costs. Just as it is possible for the division managers to achieve a "loss" in comparison with the optimal plan, it is possible for the break even level to be improved on. For example, inputs such as materials and labour, which constitute the variable cost element, may be acquired at better prices than the established standards, the quantity of inputs used per unit of output may be improved or a change in the mix of inputs may occur giving a lower overall cost for producing a given quantity of output. In addition, minor changes in the technological relationships existing in a division may enable the manager to utilise the scarce resources in a manner not foreseen when the planning model was developed, thus producing a larger quantity or better combination of outputs from a set of scarce resources.<sup>29</sup> As one author has commented:<sup>30</sup>

"Each department is expected to at least break even. If a department is able to achieve a profit by improving on any of these expected technological relationships, it should be encouraged to do so. This means that its profit will not be at the expense of one of the other departments. If a department should exceed its budgeted inputs, then it will produce each unit at a loss."

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<sup>29</sup> The suggestion that any division may achieve a "profit" when a system of shadow prices is being used may fail to consider that the aim of such a system is to use the scarce resources in the best possible manner. For if a manager finds a better technological relationship which improves the ratio of inputs to outputs then an optimal use of scarce resources would require the recalculation of the model. An improvement in the inputs-outputs ratio over that established in the plan may indicate that more resources should be allocated to this activity. Thus the continual adjustment to the model which will be necessary to retain an optimal solution would exclude the possibility of a "profit" or a "loss".

<sup>30</sup> Samuels, J.M., 'Opportunity Costing : An Application of Mathematical Programming', *Journal of Accounting Research* (Autumn 1965) pages 186, 187.

Using a system of shadow prices to ensure that division managers are guided towards an optimum output combination, and as an important part of the management evaluation system, has limitations which will reduce its application. If the division managers have the responsibility for collecting the data relating to inputs, prices, outputs and technical coefficients, they have the opportunity to convey false information to central management. This would not only distort the planning model, but will enable division managers to achieve results which are artificially better than if the correct data had been conveyed to the central planners. The optimal model which is derived, and thus the shadow prices, may be only short lived. Changes may occur in the availability of the scarce resources, the profitability of the types of output and in the amounts of each scarce resource required per unit of output. Each of these changes would require a new model and set of shadow prices to be derived.<sup>31</sup> The capabilities of computer facilities to regenerate the model will enable rapid response by the firm to changes in the optimal set of operations,<sup>32</sup> thus ensuring the firm operates more efficiently and the managerial evaluation system has greater meaning.

#### 6.5 Transfer Prices for Other Decision Types:

Many types of decisions other than that of resource allocation must be made at both divisional and corporate levels. For each decision type a certain set of cost information, together with revenue information, will be required so that a single transfer price concept will not be sufficient. What must be asked when considering the establishment of a transfer price is whether the assistance which a particular type of price may give to a

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<sup>31</sup> A decision as to the extent of change which must occur in any variable before the model will require reformation to derive a new set of outputs may be determined at the time of developing the model by using sensitivity analysis.

<sup>32</sup> As much of the data for the planning model will originate with external parties it is likely that the constraint on the regeneration of the model will be the delay between the times changes occur and the time central management is informed of them. In addition, the time required to cease production and to set up facilities for the new set of operations will delay the rate of response to any change that occurs.

specific type of decision, is sufficient to justify modelling the system of management evaluation to suit this price concept or permitting the distortion of any existing evaluation system by using a transfer price which is unsuitable.

Three decision types will be reviewed as an indication of the transfer prices which are necessary for making these decisions. If a division manager is to undertake capital expenditure decisions which will lead to the selection of those projects yielding the highest rates of return, then the data used by the different divisions must be comparable. If one division was substantially involved in transferring its production internally, at a price such as cost plus 5%, then the revenue it can expect will usually be lower than if the sales were made externally. Consequently, if the division manager is competing for capital funds with other divisions having lesser amounts of internal transfer, it is likely that a misallocation of these funds will occur. Only by pricing transfers on a comparable basis, preferably a version of market price, will currently operating projects be validly compared and proposed projects accepted in their correctly ranked order of preference. Thus, for this particular type of decision a market price transfer price is the most desirable.

The group of decisions, including those to make or buy a product, or to discontinue a particular portion of the firm's operations has lead to the suggestion<sup>33</sup> that:

"the unique correct transfer price here and everywhere in intra-company transfers is incremental cost".

Goetz demonstrates that if the objective of the firm is profit maximisation, and division managers are to be directed towards this objective, the use of any other form of transfer price will not achieve this aim. Using the example of a division either utilising an internally available computer, or purchasing the necessary computer time from an external supplier, Goetz shows that as long as the incremental cost to the firm of adding this job is

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<sup>33</sup>Goetz, B., op. cit., page 436.



less than the cost of external facilities, the firm will be better off to complete the task internally. The most important consequence of this suggestion is the invalidating of a profit concept for measuring division manager performance. Instead, a system of comparing expected costs with those actually incurred will need to be employed.

Valuing inventory, whether partly or fully completed, is the final decision type which will be considered. Conventionally it is accepted that inventory will be valued for financial accounting purposes at the lowest of cost, market value or net realisable value. Therefore, for a firm which consists of only one company but several divisions, and is involved in internally transferring products, it is likely that in normal trading conditions the inventory value adopted will be cost, thus suggesting that a cost basis for transferring products between divisions will be most convenient.

The Land and Income Tax Act 1954 does enable a company to adopt a basis of inventory valuation which is consistent with a system of transfer prices considered valid for the purpose of divisional evaluation. Section 98 subsection 4 provides that:

"the value of the trading stock of any taxpayer to be taken into account at the end of any income year shall be, at the option of the taxpayer its cost price, its selling price, or the price at which it can be replaced".

Thus the constraints imposed by the Land and Income Tax Act and the requirements of a valid system of transfer prices for managerial purposes, may be met by a single transfer price. In addition, the current emphasis in accounting literature would suggest the use of a market or replacement price for the purpose of inventory valuation.

#### 6.6 Summary:

Transfer prices have an important role in ensuring that the spectrum of decisions which must be undertaken by both divisions, and the firm as a whole, are made correctly. It is the number of different concepts including shadow prices, incremental costs and market prices which makes the

selection of a single transfer price so complex. What firms must consider is the importance of each type of decision, and in turn whether the particular decision is of such significance that it may dominate a system of division manager evaluation and reporting. Is the need for an optimal output and profit plan, thus requiring the application of shadow prices in many situations, important enough to reduce the division manager's autonomy and to overthrow the use of profit based evaluation systems?

Much of the literature on transfer prices and management evaluation has stressed the need for considerable autonomy to be granted to division managers and the application of decentralised profit centres. More attention must be given to the pros and cons of designing systems, and developing prices, which will fulfil both the need for accurate decision-making and adequate methods of management evaluation.

PART III

INTERNAL PRICES AND MANAGEMENT CONTROL

CHAPTER VII  
AN EVALUATION OF THE CONCEPT  
OF INTERNAL PRICES

7.1 Introduction:

In previous chapters several of the issues relating to divisionalised organisations were outlined as well as a consideration of why business firms may delegate decision-making authority, and the extent to which such delegation may occur. The existence of internal transfers as one problem in controlling the operations of divisions was considered and an examination was made of the purposes and relevance of particular types of transfer prices. It is the role of this chapter to examine internal prices from a broader viewpoint, namely as a method of controlling managerial actions. The features of a management control system will be outlined, the use of prices will be considered as a system of control, together with some of the difficulties of application. A brief examination of the Soviet pricing system will be made because of its similarities with the practices of business firms. Finally, systems of management control, other than internal prices, will be reviewed and their suitability for controlling divisionalised organisations considered.

7.2 The Concept of Management Control Systems:

The growth of large business organisations has placed considerable pressure on the need to design improved systems which will contribute towards the more effective operation of the organisation and its segments. In particular, systems have been developed, and need further development, which ensure that managers obtain the resources required to operate the firm and use these resources efficiently in accomplishing the aims, or objectives, of the organisation.

One of the major influences creating the demand for more sophisticated management control systems, has been the desire to extend the degree to which decision-making is decentralised. In particular, the establishment

of divisions with considerable autonomy over their operations, has required the development of improved control systems. For not only does a particular manager require guidance, so that the actions he takes conform to the objectives of the firm, but both he and the central management need to evaluate how well the delegated authority has been used.

The initial stage in developing a management control system is to identify the objectives of the organisation.<sup>1</sup> For without objectives the development of detailed plans and the concept of control have no meaning. However, when attempting to establish objectives, conflicts may occur, for in a decentralised organisation not only will objectives be established for the overall organisation but objectives for specific segments or decision-making units will be required. For example, the firm may have an objective to increase the net profit, whilst the purchasing manager may have a specific objective to minimise the holdings of inventory without incurring any stockout. Although the firm is able to establish the objectives for divisions and for the overall firm to be compatible, it is more difficult to reconcile the personal motives or objectives of its individual managers, with the objectives established for the firm. Essentially the problem is that particularly in decentralised organisations it is difficult for central management to determine whether a particular manager has acted so as to maximise the objectives of the firm. Instead, it is only possible for incentive schemes to be designed which will encourage a division manager to subordinate his personal objectives and to act so that the firm's objectives may be attained.

Designing these incentive schemes is an essential aspect of any system for management control; however, such schemes may be difficult to establish and may conflict with the concept of decentralisation. It was

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<sup>1</sup> It could be argued that a system of management control may be designed without any knowledge of the objectives, as standards may be established which do not explicitly focus on the underlying objectives. Although this is partially correct, the detailed features of the most appropriate control system in any particular situation will be substantially influenced by the objectives of the organisation.

suggested earlier<sup>2</sup> that the existence of a hierarchy of decision-makers within a firm creates a series of information channels, as each decision-maker must be considered as having a limited information capacity, therefore only a portion of the information received by a decision-maker at one level of the hierarchy may be transmitted to the decision-maker at the next level, without exceeding the information capacity of the latter person. To devise managerial incentive schemes which are related to the achievement of the company's objectives requires the central management to measure the division manager's performance in relation to the objectives. Accomplishing this will require additional information to be transmitted to central management, however their capacity to accept and interpret this new information may be limited.

In an attempt to determine how the companies in the survey established incentive schemes to encourage, or reward, the performance of division managers, a question was asked which required companies to state the types of incentives used and how these incentives were applied. The results of this question are reproduced in Table XXIII below. There are two

Nature of Reward	BASIS FOR PAYMENT			
	Performance of the firm	Performance of division	No consistent basis	Other
Salary	7	13	4	8
Bonus	2	7	-	2
Share options	2	-	1	1
Shares	-	-	-	1
Others	2	-	-	-

interesting features indicated by this table. Firstly, dominant use is made of salary payments to reward the performance of division managers. In comparison with the use of salaries, all other types of incentives are of minor importance. Bonus payments were used by only 32% of the

<sup>2</sup>Chapter I, pages 9-10 supra.

respondents, whilst the use of share options represents only 12% of the replies. The second interesting feature is the method by which the incentive payments are applied. Of the replies indicating the use of salary payments, 41% adjusted the payment on the basis of each division's performance, 22% on the basis of the performance for the overall firm, 12% on no consistent basis, and 25% used some other basis such as the length of service or seniority.

Developing detailed standards or plans which reflect the broad objectives is an important characteristic of any management control system. The plans or standards will not only provide guidelines for the actions of decision-makers or managers, but will provide a criterion for assessing the performance of managers to whom have been delegated authority and responsibility for decision-making. As the autonomy extended to sections or divisions of a firm is increased, the plans or standards prepared by central management for individual divisions will be less detailed and may consist only of a desired rate of return, or a specific level of profit. Central management providing fewer standards or guidelines for control does not necessarily imply that the operations of the firm are under a lesser degree of control, as the division managers who have the responsibility for achieving or exceeding the standards will need to establish detailed standards such as amounts of inventory, employee turnover, material costs, output, and wages costs. Division managers who do not know their performance for each of these strategic factors will find the achievement of the overall plan or standard difficult.

Closely associated with the design and establishment of standards is the measurement of performance. In a decentralised system, central management is limited to measuring the performance of individual managers in terms of the standards or plans which have been established. Thus, if the standard was the improvement of the profit level, or to achieve a given rate of return, or a gross sales figure, these would be the primary items considered when assessing performance. As the individual managers will

utilise a greater range of standards to control their operations, many additional aspects of the subsequent performance will be measured and evaluated within the division, as the achievement of these detailed standards would be a necessary prerequisite to achieving the overall plan or objective established by central management. A necessary consequence of performance measurement is the feedback of a comparison between the performance and the established plan. This information will provide additional guidance to managers in planning the detailed structure of their future operations.

An alternative and more general representation of the control problem in organisations is suggested by Arrow.<sup>3</sup> He considers that the problem which must be solved if decentralised organisations are to direct units, or divisions, towards the overall goal of the firm is:

"the choice of operating rules instructing the members of the organisation how to act, and the choice of enforcement rules to persuade or compel them to act in accordance with the operating rules".<sup>4</sup>

The suitability of any particular system of management control may be evaluated, at least in part, by considering how well it meets the general features of a management control system in a specific application. With this background the acceptability of internal prices as a system of control may be considered.

### 7.3 The Price System and Intra-firm Control:

Attempts during the last two decades to establish prices within business organisations have as their origins many factors relating to the extension of decentralisation to sections of the firm, the growth of conglomerate organisations and the desire to evaluate the "autonomous" units in terms of profit. To complete the profit measurement the transfers between divisions were priced so that comparisons between the divisions would be

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<sup>3</sup>Arrow, K. J., 'Control in Large Organizations', Management Science, April 1964, pages 397-408.

<sup>4</sup>Ibid., page 398.



facilitated. Closer integration between units, with a larger percentage of production being transferred internally, resulted in the application of market based transfer prices, to remove any distortion of the resulting profit figures and the evaluation of performance.

As a system of management control, the use of profit centres involves the establishment of divisional objectives, probably dominated by a profit maximising concept. Standards or plans to guide division managers would be developed to complement the broad objectives, and such plans would include budgeted profit statements, comparisons with past profit figures or establishing desired rates of return. Actions undertaken by the division managers would be assessed and compared with the established indicators to give a measure of "success". The transfer prices in such systems are incidental, but necessary, elements in developing profit statements and at this stage little consideration had been given to the potential role of internal prices as a means of guiding internal operations.<sup>5</sup>

Following a number of articles in business literature which have discussed the attributes of profit centres as a method of divisional control, attacks<sup>6</sup> have been made on the concept of profit centres and the application of transfer prices, to direct and evaluate the managers of decentralised units within a firm. These attacks have as their themes the concept of responsibility accounting and the efficient direction of divisional managers. It is suggested that in many situations the application of a profit concept to divisions is unjustified as the managers concerned do not control the profits. Furthermore, extending the idea of a manager being held responsible only for those variables over which he has a degree of control or administrative responsibility, then division managers should not be concerned with transfer prices. These two criticisms may not be valid as with the first it is possible to identify many situations when a manager does substantially

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<sup>5</sup>It was recognised, however, that the application of a particular type of price may encourage division managers to undertake decisions which would be beneficial to the firm's operations.

<sup>6</sup>Goetz, B., op. cit.; Henderson, B. and Dearden, J., op. cit., pages 144-160; Wells, M. C., 'Profit Centres, Transfer Prices and Mysticism', Abacus (December 1968) pages 174-181.

control the profit his division earns. However, the decision to use an evaluation method other than a profit concept does not necessarily remove the need for transfer prices. The second criticism may be equally invalid as it fails to realise that control is a matter of degree and many of the variables, such as labour rates, labour usage or costs of material acquisitions, will be subjected to a limited degree of managerial control. In particular, should a manager have the right to purchase transferred inputs externally if the transfer price is unfavourable<sup>7</sup> in relation to the market price, then he does have a considerable degree of control over the price and may be held responsible for the level of costs incurred.

The second theme, that profit centres and market transfer prices may not direct managers towards the objective of overall profitability, could be valid in certain circumstances. These arguments are not necessarily implying that the establishment of all transfer prices will misdirect division managers, but rather that the application of market based transfer prices in association with profit centres may be misleading. This was recognised by Hirshleifer<sup>8</sup> in the special situation where no intermediate market exists. However, it has more generally been expressed by Goetz,<sup>9</sup> and Henderson and Dearden,<sup>10</sup> the former recognising that for "relevancy and goal congruence . . . incremental costs must be used as transfer prices". Although such a suggestion will remove profit centres as evaluation devices, it is important for two reasons. Firstly, it shifts the emphasis on transfer prices from being a relatively unimportant element of a system designed to evaluate and perhaps motivate division managers, to being a significant part of a control system with emphasis on the role of internal prices, as an aid

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<sup>7</sup>The suggestion made in Chapter V page 79 supra that firms will not usually consider a transfer price greater than the market price indicates that to the extent a manager may negotiate a market price he is effectively negotiating a transfer price.

<sup>8</sup>Hirshleifer, J., 'On the Economics of Transfer Pricing', op. cit.

<sup>9</sup>Goetz, B., op. cit., page 436.

<sup>10</sup>Henderson, B. and Dearden, J., op. cit., pages 145-146.

to divisional decision-making and planning. The second reason, which is closely related to the one above, recognises that it is no longer possible to consider divisions as entirely separate units and to employ a simple profit or loss index for measurement. Rather, the dependence amongst divisions must be recognised and controls devised, in this case internal prices, so that individual managers will formulate plans and make decisions in the best interests of the whole firm.

Continued growth in organisation size and complexity, with a further need to decentralise decision-making, has prompted at least one author<sup>11</sup> to consider the firm as an economy, with the individual divisions acting as suppliers and consumers. The relationships between a firm and an economy has prompted the suggestion that a system of prices may be an efficient management control system for a decentralised firm. If it is accepted that:

"management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organisation's objectives"<sup>12</sup>

then the adoption of a price system to control a firm's operations must fulfil this definition to be acceptable.

Although objectives may be established without regard to the application of any particular management control system, it is necessary, having established a set of objectives, that the system of control which is implemented directs the firm's operations towards fulfilling these objectives. Therefore, the price system may be employed to achieve most quantifiable objectives although it is more often associated with the objective of profit maximisation.

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<sup>11</sup> Gordon, M. J., 'The Use of Administered Price Systems to Control Large Organizations', appearing in Bonini, C., Jaedicke, R. and Wagner, H. (Editors), 'Management Controls : New Directions in Basic Research' (New York : McGraw Hill, 1964) pages 1-26.

<sup>12</sup> Anthony, R. N., 'Planning and Control Systems : A Framework for Analysis' (Boston : Graduate School of Business Administration, Harvard University, 1965) page 17.

The second requirement of a control system is the establishment of plans or standards which will guide the actions of managers. Although such plans are most often considered as budgets, the use of an appropriate set of prices for internal transfers will influence the actions of division managers. As it was suggested earlier, using incremental costs as the price may, in certain circumstances, guide decentralised division managers towards acting in the best interests of the firm. Using prices may achieve economies in information transmission, as only a small quantity of information will be required by division managers, from central management, as the guidelines for their operations. Similarly, division managers would be required to convey only limited amounts of information to central management so that appropriate prices may be derived. In those situations where the relationships between the divisions are relatively simple, central management may need only to convey an instruction that transfers are to be priced at market price or perhaps incremental cost. More complex situations of dependency, and the joint usage of facilities, would require the transmission of sufficient information to enable the application of mathematical programming techniques.

Measuring and evaluating the performance of personnel, especially managers of decentralised operations, will not be inhibited by the application of a control system based on prices. Two methods of evaluation may be employed. With the first, central management will establish planned profit levels, or indices, and an appropriate set of prices. Actions of performance, guided by the prices would, if satisfactory, yield the planned profit level and rewards would be made depending on how the actual performance, guided by prices, compares with the planned performance index. Such a scheme would be applicable in those situations where a market price and profit centre concept is employed, where transfers occur at incremental costs and where mathematical programming solutions yield transfer prices. The second method of application is to measure performance, not in relation to a planned level on an appropriate index, but to compare it with a zero base. Thus, using a market price for transfers, the manager would be

offered an incentive scheme which would encourage him to maximise the level of actual profit above zero. When a programming solution is obtained the shadow price would provide an optimal level of performance at a zero profit, should the manager achieve or improve on this,<sup>13</sup> a suitable system of rewards would exist.

#### 7.4 Problems of a Price System for Intra-firm Control:

In previous sections it has been suggested that a system of prices may be utilised to control the operation of decentralised organisations. If a group of objectives has been determined and communicated to division managers, the establishment of an appropriate set of prices will, when combined with a suitable system of incentives to guide and encourage division managers towards the objectives, provide a system of management control. However, several practical and theoretical difficulties may limit the ability of a price system to control the operations of a firm.

Some of the practical problems have been referred to in this and earlier chapters. For example, if the price required is to be based on the market, difficulties may exist in establishing a market for a product with specific features as to quality, quantity or time of availability. Division managers may convey false information to the central planners, thus reducing the validity of the resulting plans in terms of established objectives. Adapting the firm's prices to meet changes in the external prices, or internal operating conditions, may present difficulties because of the frequency of the changes or the quantity of information and calculations required to alter the prices.

One issue which has both practical and theoretical aspects is that of motivation, as individual managers with self-interest as their primary motive may act in their own, rather than the firm's, best interests. Designing a suitable system of incentives requires a knowledge of the particular types of reward which will motivate individual managers, as well

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<sup>13</sup>The possibility of this occurring is discussed on page 111 supra.

as how a particular set of incentives can be applied. In those situations where the operations of the divisions are substantially autonomous and only minor relationships exist between divisions, maximising of divisional results will contribute to an overall firm maximisation. Thus, an incentive scheme which rewards division managers according to their results will be rewarding division managers on their contribution to the firm's overall results.<sup>14</sup> When a considerable degree of dependence exists between divisions, the need to employ "shadow prices" to determine an optimal solution for the firm will mean that individual managers cannot maximise their own and the firm's performance without guidance from central planners, or by using artificial prices coupled to an appropriate incentive scheme. In these circumstances, the incentive payments must be related to how closely a particular manager approaches the optimal plan measuring his contribution to the overall firm profit. With both situations considerable amounts of information may need to be transmitted to central management to enable the measurement of how well a manager has performed, assimilating and analysing this information may be difficult for central management, because of the problem of limited communication capacity, thus reducing the value of the system for decentralised organisations.

The existence of externalities, or external relations,<sup>15</sup> between divisions of a firm presents a problem so that the actions taken by one division will influence the results achieved by other divisions. These relations may be of various types including nuisance elements, such as excess

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<sup>14</sup>Two problems may arise with this type of incentive scheme:

- (i) to know when the actions of any division manager are the optimal possible in the circumstances,
- (ii) to assess the impact of past decisions on current results and currently made decisions on the future rather than the present assessment period.

<sup>15</sup>This problem was referred to in Chapter VI, pages 94, 95 and 103 supra, and has been discussed by Hirshleifer, J., 'On the Economics of Transfer Pricing', op. cit., 'Economics of the Divisionalized Firm', op. cit.; Whinston, A., 'Price Guides in Decentralized Organizations' appearing in Cooper, W. W., Leavitt, H. J. and Shelly, M. W. (Editors) 'New Perspectives in Organization Research' (New York : John Wiley & Sons, 1964) pages 405-448.

fumes or noise created by one division and having an impact on another division's operations, or they may be demand or technological relationships. With a simple system of pricing product transfers any manager will not consider the impact of his actions on other divisions. To overcome the impact of externalities it would be possible to establish the nature of all the relationships and to place a price on each, so that any particular division would be penalised by a price or a charge related to the extent of the unfavourable relationship. If correctly designed, the amount of the charge would force the offending division to reduce the nuisance, or compensate the offended division sufficiently for it to accept the externality. Practically the design of such penalty prices is difficult because of the large number of possible relations and their continually changing nature, perhaps requiring new prices to be generated hourly or daily.

One approach to reducing the problems of externalities is to restructure the organisational units so that the externalities are "internalised".<sup>16</sup> Units are created to reduce the number of relationships between divisions. However, the practical possibility of removing the majority of them would seem to be doubtful, for, as it has been indicated, the relationships may, in a dynamic situation, be continually changing and may not concern only two but several divisions.

Problems of uncertainty exist in several different ways when considering a price system for organisational control. Changes in a dynamic economy occur with great frequency, so that any variable may alter its value on several occasions within a short period of time, for example, the prices of different inputs are changing continually. Such a situation creates the need for sets of internal prices which may be changed rapidly, for if any firm attempts to stabilise its internal prices for a relatively long time the firm will not remain in an optimal or maximising position, as the decisions made and plans formulated would be guided by inappropriate prices.

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<sup>16</sup>This term is used by Whinston, A., 'Price Co-ordination in Decentralized Systems', Ph.D. thesis (Pittsburgh : Carnegie Institute of Technology, Graduate School of Industrial Administration, 1962) page 11 and Chapter VI.

It is recognised that the availability of extensive computing facilities will reduce the time cycle for revising internal prices. However, the extent to which control will be maintained may depend on the delay in division managers receiving and collating information such as changes in profit contribution or input costs, which are essential to deriving adjusted prices.

A second aspect of uncertainty concerns the possible actions, and the impact of the actions, taken by external rivals within the same industry group. If a rival is undertaking a research programme to develop a lower cost processing method or to produce a new product, the action of the divisions within a firm must be influenced by how successful the research is, or by the features of the new product developed by a rival. That is, the optimal set of decisions for the divisions will depend on the two possibilities, unsuccessful or successful research by a rival. Thus, to ensure that the division operates in a maximising way two sets of prices must be supplied by central management, the adoption of a particular set, and in turn a specific set of actions being determined by the results of the rival. Realistically the situation is more complex as the potential success of a research project is not determined by two possibilities but rather by a probability distribution indicating the likelihood of success. Furthermore, the existence of many such projects amongst rivals with only a percentage of them being known to a particular firm, will introduce considerable complexity into the price system. The firm will require numerous sets of internal prices equal in number to the possible states of the outside world, for without these, divisions cannot be guided by prices to undertake the best course of action.

The lack of separability between divisions, referred to earlier as the problem of external relations, has an important impact on uncertainty. Any division manager would be unable to make the decisions necessary to achieve his maximum position, without knowing the strategies which the managers of related divisions intend to adopt. Similarly, individual division managers may have different amount of knowledge concerning the possible strategies of a related division. Both these problems illustrate



that a set of prices may be insufficient to enable a particular manager to plan a group of actions which will achieve an optimal or maximising position.

Arrow<sup>17</sup> extends the problem of uncertainty, as a constraint on using prices for management control, by observing that a manager will not be required to maximise a single profit figure, but rather to achieve the highest expected value for the profit. However, any manager attempting to avoid risk will undertake those actions which yield profit with a high probability of being achieved, but which result in a lower profit level than if the expected value was maximised by a manager who is "risk neutral". Thus the particular manager would not be contributing fully to maximising the objective of the firm but would be encouraged to undertake his actions as a risk averter knowing that his incentive payments will be lower, but more certain.

The price system as a system of organisation control does present difficulties and some of these are peculiar to the price system whilst others, especially uncertainty, are common to most systems of control. It is the impact of each problem on the effective operation of a particular control system which must influence the acceptability of a specific control system in a firm.

#### 7.5 The Soviet Pricing System:

The Soviet economy and the large business firm exhibit several similarities which arise, at least in part, from the comparable planning systems used. Both are examples of centrally planned economies, the firm's operations being planned to varying degrees, depending on the particular firm, by the central management group, whilst the Soviet economy is planned by a group of agencies including the Ministry of Finance and Gosplan (the State planning commission). Recognising the similarity

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<sup>17</sup> Arrow, K., 'Control in Large Organizations', op. cit., page 407, 'Research in Management Controls : A Critical Synthesis' appearing in Bonini, C., Jaedicke, R. and Wagner, H. (Editors), 'Management Controls : New Directions in Basic Research' (New York : McGraw Hill, 1964) pages 317-327.

between these organisations would suggest that a comparison between the control systems employed could be made and that in particular the role of prices may be assessed in each economy.

Literature<sup>18</sup> on the Soviet pricing system indicates that prices have four functions in the Soviet economy. These are:

- (i) The use by central planners of methods to ensure that compliance with centrally derived plans does occur and to evaluate the performance of managers in executing planned objectives.
- (ii) To serve as a rational guide for resource distribution or allocation.
- (iii) To determine the distribution of income.
- (iv) To maintain or achieve a desired relationship between supply and demand.

Considering the resource distribution function the central planners initially establish broad requirements for items such as military expenditure and steel output. These requirements are converted into a vast range of output types and quantities for each industry group, by the use of input-output and mathematical programming procedures. The required output levels are in physical terms and each enterprise is informed of the volume and general specifications of the output types it must produce, the amounts of inputs including labour, materials and equipment which it has available to employ. At this stage of resource allocation prices have a very limited role and distributions are made in physical units. However, within any enterprise prices do have a role in resource allocation. Managers, given the task of converting a specified set of inputs into a required set of outputs, may with the aid of prices manipulate the use of inputs to achieve or exceed the desired level of outputs. In addition, by adjusting the quality and detailed specifications of his output, the manager may gain some advantage from the established price structure.

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<sup>18</sup> Bornstein, M., 'The Soviet Price System', *American Economic Review* (March 1962) pages 64-99; Felker, J. L., 'Soviet Economic Controversies' (London : The M. I. T. Press, 1966).

Having established the pattern of resource allocation in physical terms the plans are converted into a common denominator by the use of prices. Thus, the enterprise manager will have a plan measuring a range of available inputs and specified outputs in monetary terms. The achievement or deviation from this plan will be assessed in monetary terms.

Although prices are classified into a large number of groups, only the wholesale prices will be briefly reviewed. With the wholesale group there is a price, "the wholesale enterprise price", at which transfers of products occur between enterprises and this consists of "the average branch cost of production plus a defined scale of profit",<sup>19</sup> and a "wholesale industry price" for transfers between the enterprise and the State trading organisations. The latter price comprises "the wholesale enterprise price and includes a percentage mark-up by the industry's own sales organization to cover expenses and to provide a profit".<sup>20</sup>

The important feature of these prices is that they are averages established for long periods of time, as it is considered necessary that prices remain unchanged if stability is to be achieved. However, the infrequency and inconsistency of price revisions has resulted in some enterprises being placed at an advantage, in relation to other enterprises, so that the inaccurately measured profits will cause incorrect assessments of enterprise managers. If managers do utilise prices, even in a limited way, when making their internal allocation decisions, the existence of outdated prices, often having no relationship to current costs, will result in sub-optimal use of inputs from the position of the enterprise and the economy. Similarly, using prices for assessing the performance of enterprise managers in terms of profit<sup>21</sup> will only be appropriate if the prices are adjusted in a consistent manner and have some relationship to costs. If

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<sup>19</sup>Felker, J.R., *ibid.*, page 104.

<sup>20</sup>Felker, J.R., *ibid.*, page 105.

<sup>21</sup>Prior to 1965 the main index for assessing the performance of managers was gross output. However, as this does not encourage the demands of consumers to be considered, saleable output and profit have been adopted.

adjustments are not made regularly or are made in only selected enterprises the effect of any incentive to encourage performance will be uncertain.

An approach which closely resembles the method discussed in Chapter VI for developing "shadow prices" to achieve an optimal profit situation in business firms is currently being examined by Soviet economists.<sup>22</sup> Given that the economy has a plan it wishes to achieve, a set of "efficiency prices" may be derived for all input factors and outputs, so that by providing a suitable incentive scheme managers of enterprises will make their decisions so that the desired plan will be attained.

The Soviet economy relies on a price system as a method of resource allocation or planning to a lesser degree than many business firms. Instead, most of the allocation decisions are achieved by utilising physical quantities. However, prices do have an important function for ensuring enterprise managers are guided towards the established plan and assessing their performance. The prices used for this purpose are less accurate than those adopted by many business firms who recognise the need to have regular adjustments as costs change. Without these adjustments, business firms have realised that misvaluation of performance will occur and incentive schemes have little, if any, meaning. Soviet economists acknowledge the limitations of the present price system and the current suggestions to introduce "efficiency prices" or to adjust prices in a consistent manner recognises that a price system may have an important function as a control system for centrally planned economies.

#### 7.6 Alternative Systems of Control:

There exists a group of control systems, other than that of internal prices, which may be utilised to achieve the broad aims of management control systems. Two of the commonly adopted systems are budgetary control and standard costs. A third general group is "mixed systems",

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<sup>22</sup>Zauberman, A., 'Aspects of Planometrics' (London : The Athlone Press, 1967) pages 59-129.

which will incorporate characteristics from two or more specific types of control systems. Although the discussion has been concerned with decentralised organisations, it was suggested earlier that decentralisation can exist in a series of degrees, so that "mixed systems" may include a specific decentralised control system, together with direct intervention or control by the central management group in certain decision areas. Indeed, it is likely<sup>23</sup> that this latter form of management control may prevail in many organisations.

Budgetary systems have been referred to incidentally when assessing the role of internal prices. In particular, it was stated that the application of a planned or budgeted profit figure, or a rate of return, together with a set of internal prices may provide a suitable system of management control. The concept of a budgetary system is usually broader than just described, as it includes the detailed planning for sections of the firm, as well as the whole firm, and detailed follow-up procedures to be carried out during and after the period of the budget.

Objectives which have been established for the whole firm, such as an increased market share, increased sales, or increased profit will be converted into detailed plans, specifying in financial and preferably physical terms the levels of different expenditures and revenues necessary to achieve the overall budget or plan. In a decentralised organisation the existence of divisions will result in most of the detailed planning being completed within the divisions. However, the overall plan or budget will be established by central management, so that individual managers are required to develop their plans within this constraint. Furthermore, the existence of dependency between divisions, perhaps as a consequence of internal transfers, the joint use of facilities or other relationships, will require a considerable amount of detailed planning to be undertaken by a group comprising the managers of two or more divisions, or comprising the division managers and central management. If the planning is not completed by a group which represents

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<sup>23</sup> Empirical evidence of this is included in Chapter II.

the parties to be affected by the plan, the possibility of achieving the desired objectives of the organisation will be remote. An alternative approach which has a close relationship to the method for establishing an internal price for equating the supply and demand for two divisions,<sup>24</sup> or the method for obtaining an optimal price under the decomposition principle,<sup>25</sup> involves an exchange of information between divisions and the central management. Assuming that an overall plan has been derived by central management which establishes the desired performance for the firm, then each division manager may submit a proposed plan of his operations to central management. If the plans from the divisions do not yield the desired result for the firm, central management may instruct the divisions involved to alter particular aspects of their plans. These alterations may require the reformulation of the divisional budgets, which in turn will be submitted to central management. After a number of adjustments and reformulations the desired plan should be achieved. Although it could be argued that central management should convey the desired plan in detail to each manager, the effect of participation by the division managers and the difficulties which central management may have in formulating a detailed plan for each division should outweigh the merit of this suggestion.

At the planning stage of a budgetary system, substantial amounts of managerial time will be required when formulating the plans, to ensure that the firm's overall objective is achieved. This combined planning may not only cause friction between division managers, but will probably involve considerable direct guidance by central management. If central management is to provide the necessary guidance, substantial amounts of information will need to be transmitted from the divisions regarding the relationships between the divisions and the technological and cost relationships existing within a division. Central management may not have the capacity to assimilate the information effectively, nor to provide the necessary guidance within a reasonable period of time.

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<sup>24</sup> See page 90 supra.

<sup>25</sup> See pages 101-104 supra.

As a device to assess performance after a period of operations, the budget system will enable a detailed comparison and the establishment of numerous variances. Although these will be important to a particular division manager it is doubtful whether central management has the capacity to interpret the information contained in these variances. Rather, central management will wish to know the performance of each manager in comparison with a few key factors, such as the planned profit or sales levels.

The important issue is whether a budgetary system is able to fulfil the same functions as internal prices as a management control system,<sup>26</sup> or alternatively whether the combination of a budgetary system and internal prices will provide a system of control which is superior to one of internal prices, or a budgetary system. Instead of a set of prices, planning will be achieved by a statement of the levels of expenditure and revenues for the relevant variables, whilst performance will be guided towards these levels by a suitable system of incentives, and measured against the budgeted levels. Wells<sup>27</sup> states that the principles of responsibility accounting require that a manager be held responsible for only those costs and revenues which he can control. Thus, as a division manager is unable to control the prices of internal transfers, except perhaps in situations of negotiated prices, he should not be held responsible for them. This, he argues, removes the need for pricing internal transfers and allows the application of a budgetary system, using financial and physical indicators to evaluate management performance. What must be recognised is that the control extended to any division manager over a particular variable is a matter of degree and not absolute. Thus, with this particular aspect a manager may exhibit control by purchasing the required inputs externally, if the internal price is unsatisfactory.<sup>28</sup> Without a transfer price being available, a manager who

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<sup>26</sup> It is realised that for financial accounting purposes the accumulation of the costs incurred at each stage of processing will be necessary. However, this requirement is outside the scope of the present discussion.

<sup>27</sup> Wells, M. C., op. cit., page 178.

<sup>28</sup> In situations of restricted decentralisation a manager may have no choice as to the source of purchase. These situations would suggest that according to responsibility accounting the manager should only be concerned with the quantities of inputs used to achieve specified outputs.

is required to continually compare alternative sources of acquisition, will be unable to plan his operations most efficiently or make the decisions which are necessary to achieve the desired objectives.

If the concept of management control expressed earlier in this chapter is adopted, it is doubtful whether a budget expressed in a few key variables will provide sufficient guidance and information to enable a division manager to plan the effective use of the resources within his control. Rather, in the absence of any internal prices for the guidance of division managers, it would be necessary for central management to provide detailed plans, expressing in physical and monetary units, of how the resources available will be used to produce outputs. Without such plans division managers could not determine the most economical uses of various inputs to achieve the desired outputs. Devising these plans at central management level would require the use of prices to establish the best possible combinations of inputs to produce various outputs. Considering the performance evaluation stage, the results may be compared with the detailed plan. However, this information, although of importance to individual managers, may be of little relevance to central management. By necessity they would be confined to considering division manager performance in comparison with a few broad objectives. If performance is measured by a range of physical units and monetary units, this broad comparison will not be feasible. Although the primary comparison is between actual and budgeted levels, the use of prices will convert diverse physical units into monetary amounts, thus enabling the application of key criteria such as profit, sales or costs.

The application of internal prices and budgeted data may enable a greater degree of decentralisation, particularly at the planning stage, than if only budgeted data is used. Increased decentralisation may be an essential feature in large organisations where the central management is unable to formulate detailed plans which will guide the actions of division managers. In addition, the existence of uncertainty in its many forms will limit severely the continual reformulation of detailed plans by central management.



Reference has already been made to the use of cost based transfer prices and it was suggested in Chapter V that these prices could be combined with an evaluation based only on costs to yield a zero "profit" when the planned performance had been achieved. More detailed standards for the inputs and outputs, if correctly devised, may be used as an effective control system. The standards would have to be derived by central management and conveyed to individual divisions as the plan or guideline for actions. Coupled with a properly designed incentive scheme, managers would be motivated towards the achievement of the standards. Reporting the performance would be achieved at several levels of detail, for within the divisions considerable amounts of detail would be required to identify the causes of variances from standards. For central management the aggregated variances provide an effective summary of performance and a basis for formulating incentive payments.

A system of detailed standards for guiding managerial action may reduce the level of decentralisation. Central management requires detailed information on a continuing basis regarding the technological relationships existing within each division. This information, together with cost information, is essential for the design of standards which indicate desired levels of performance. In addition to the standards, plans would be necessary to indicate the budgeted quantities of each product which should be produced. Division managers will be unable to establish these quantities without knowing the contribution of each product to the final profit and the extent it uses scarce resources. These considerations will place a strain on the capabilities of central management and indicate that to be effective, standard costs involve a reduction in the possible degree of decentralisation. In addition, a need exists for budgets, perhaps in physical units, to be associated with a management control system relying on standard costs.

#### 7.7 Conclusion:

Employing a system of internal prices as a method of management control has considerable merit and probably deserves a greater degree of

attention. Its major merits include the ability to operate in organisations where a substantial degree of autonomy is granted to the division managers. Properly conceived systems do not require central management to know the detailed technical relationships of the divisions; neither is there a need for substantial amounts of information to be transferred between the divisions and central management. The price system provides a basis for individual managers to plan their operations and it enables an evaluation of performance against a stated objective.

Most business units have been reluctant to delegate the necessary autonomy for planning at divisional level, but have instead relied on budgets and standards developed by divisional and central managers working in concert. The detailed planning requires a considerable cost in executive time and creates an illusion of autonomy. It is not suggested that these control mechanisms are ineffective, as they have an important role in controlling intra-division activities. However, the requirement is for a system which enables an organisation to be controlled most efficiently. The trend of traditionally centrally controlled economies such as the Soviet Union towards the application of price devices and greater degrees of autonomy indicates the potential of internal prices as a substitute for detailed planning and control involving budgets and the direct intervention of central management in the operations of divisions.

## CONCLUSION AND SUMMARY

In this thesis some of the management and management accounting aspects of decentralised organisations have been considered, together with the problems which may arise when internal transfers between divisions must be priced as a part of the management control system. The issues of decentralised organisations and transfer pricing have been examined from a theoretical viewpoint in an attempt to establish a theoretically desirable form of transfer price, whilst the empirical evidence has been presented as an indication of the current state of transfer pricing practices in New Zealand business units.

Early in the thesis, the reasons were examined for delegating to the second or lower levels of the organisation hierarchy, the authority to undertake certain decisions. In addition, the reasons were considered for establishing identifiable sub-units or divisions, which may have a substantial degree of autonomy over their operations. At a theoretical level the reasons postulated for establishing identifiable units included: the growth in the size of business units, a need to provide a basis for assessing the performance of separate activities and the need to reduce the pressure on communication channels. From the empirical evidence it was established that the most important reasons for creating separate divisions included: the size of operations, the need to provide closer control over costs, a desire to identify the profitable units and as a result of geographically isolated operations.

Implicit in reasons such as the control of costs and the assessment of profitable units is the need to collect financial information regarding the operations of the divisions, and to present this information in an appropriate manner to both division and central managers. It has been suggested that these reports may be used for at least two major purposes, namely, to evaluate the performance of a division and to provide a guide for decision-making by either central or divisional management. These reports have

been developed on two major bases, that is, the use of cost reports and profit reports. In particular, the application of profit reports as a method for reporting the results of divisions has dominated in many firms due, at least in part, to the substantial autonomy granted to division managers and the method of divisionalising adopted. To the extent that the results of the survey reveal the empirical position in New Zealand, it is apparent that the predominant method of establishing divisions is by product lines. This enables the division managers to have a degree of autonomy granted to them over many of the factors responsible for the earning of a profit, whereas the existence of divisions established as functional areas would limit the autonomy to one aspect of the profit earning process.

Associated with the development of large business units has been a degree of integration between segments of the firm and thus the transfer of a portion of one division's output to another division, as one of its inputs. The pricing of these transferred units has an important role in the evaluation of any division and in the decisions any division manager may make.

Initially the problem with pricing internal transfers was one of financial accounting and thus concerned with ensuring that the full costs incurred in any division were transferred forward to the "purchasing" division. However, the growth of identifiable divisions, each granted a substantial degree of autonomy, produced a need to assess the performance of separate activities within a firm. The reluctance of firms to price internal transfers above cost, even when the divisions were considered as profit centres, represented a confusion between the requirements of financial accounting together with the realisation concept, and the need for useful management accounting information. Perhaps as a result of better educated managers who realised the need for effective methods for reporting the operations of divisions, the extension of control to division managers, or the existence of greater amounts of internal transfers, there was considerable attention given to using transfer prices more appropriate for

divisional evaluation and decision-making. Principally it was suggested that the growing use of profit centres required the application of market prices to avoid any distortion to a particular division's results, as a consequence of internal transfers.

The empirical evidence indicates that New Zealand business units have evolved their policies regarding transfer prices to approximately this stage. That is, the widespread use of a profit concept to evaluate the performance of divisions has been adopted and in several examples market based transfer prices have been utilised. However, the degree of importance of internal transfers in New Zealand is relatively small as in the selected sample of companies forty-five per cent of the divisions transferred internally only a minor portion of their production. This would to some extent account for several firms using full cost as the method of pricing transfers when a profit concept is utilised for evaluation. In those companies where substantial amounts of internal transfers occurred the use of market prices dominated; however, a few firms in this group have failed to realise that cost, or cost plus a mark-up, is incompatible with the concept of profit for evaluation.

Although the concept of profit and in turn market based transfer prices has been widely established, considerable attention has been given to examining how effective these procedures are in ensuring that division managers will plan their operations and make decisions in the best interests of the whole firm. Thus the attention has been directed to considering management control systems which will facilitate co-ordinated planning at division and central management levels and to provide a means of assessing how effective this planning has been. It is no longer considered acceptable to adopt a simple profit or loss index for evaluating division managers' performance, when the use of market based transfer prices within this index may create conflicts between the best courses of action for the divisions and those for the overall firm. Thus the application of incremental costs for pricing internal transfers has been postulated as the price

which will guide the divisions towards taking actions in the best interests of the overall firm. Coupled with a suitable incentive scheme there would be little difficulty in reporting and evaluating the performance of divisions.

Extensions to the idea of using prices as planning tools in decentralised firms have been prompted by the application of mathematical programming techniques. Problems of scarce resources within a firm and a desire to employ these resources amongst competing uses, in the best possible manner, has prompted the derivation of "shadow" prices. Although the problems of comparing a division manager's performance with an optimal plan are more complex than when a simple profit index is used, this approach does, with the aid of appropriate incentives, ensure that the interests of the overall firm predominate. However, this is only able to be achieved by a considerable degree of centralisation, as no division manager will, when acting in isolation, be able to undertake plans which ensure that the best interests of the firm are considered. The procedure may involve a series of exchanges between the central and division managers regarding the plans to be adopted. In these exchanges the role of the division manager will be that of a passive, or "notional" decision-maker; whilst the central managers will have an active role in ensuring that the plans adopted by the divisions are in the best interests of the overall firm. Thus an attempt to obtain the "optimal" result for the firm requires a centrally derived plan and a reduced level of decentralisation.

The role of prices in a management control system has changed from having a minor one, in a system of evaluating divisions as semi-autonomous profit centres, to being an important element in a centrally derived plan aimed at co-ordinating the actions of division managers towards the achievement of a desired goal for the firm as a whole.

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## APPENDIX I : THE EMPIRICAL SURVEY

The survey of New Zealand business units was conducted in three stages. Initially a preliminary questionnaire<sup>1</sup> was used to establish an acceptable sample of companies who were willing to participate in the project. A detailed written questionnaire<sup>2</sup> was forwarded to those companies who indicated in the preliminary questionnaire that they were using transfer prices and were willing to participate. The third stage of the study consisted of interviews with a selected group of the companies who replied to the questionnaire.

Preliminary questionnaires, together with an explanatory letter, were forwarded to those companies who, in the author's opinion and from examining 'The New Zealand Business Who's Who', appeared to be likely users of transfer pricing. Such an approach to establishing a sample does not give a representative picture of how widely transfer pricing is used, as the sample is biased towards the most probable users. Similarly, it does not ensure that all those companies using transfer pricing are included in the survey. However, it enables a sample of a manageable size to be established, this sample having a high probability that transfer pricing will be extensively used.

Eighty preliminary questionnaires were mailed to companies and of these, 63 or 79% were completed and returned.<sup>3</sup> Of the replies, 44 or 66% indicated that they were using transfer pricing, 19 that they were not, and 2 did not answer the question. The inquiry also asked the companies to indicate their willingness or otherwise to participate in the project. Of the 63 replies, 50 or 80% were willing to participate, and of these, 40 were using transfer prices. Those who indicated that they were unwilling to participate constituted 20% of the respondents; however, only 2 of the

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<sup>1</sup> See Appendix II, page 151 *infra*.

<sup>2</sup> See Appendix III, pages 152-162 *infra*.

<sup>3</sup> No attempt was made to follow up the initial inquiry in those instances where a reply was not received.

APPENDIX I continued

13 companies making up this group were using transfer prices. Thus, the desire not to participate would seem to be more closely related to the lack of any transfer price application than to a disinterest in this type of research.

The main questionnaire was mailed, together with a letter explaining the sections of the questionnaire and the method of completion, to all respondents who were willing to participate and were using transfer pricing. Of the 40 questionnaires mailed to companies, 33 or 83% were returned fully or substantially completed. This response represents 41% of the initial sample of companies.

Following an analysis of the results obtained in the questionnaire a group of companies was selected for follow-up interviews.<sup>4</sup> The companies selected were those who indicated in their answers to the questionnaire that they were most closely involved with the issues of transfer pricing. 23 companies were selected; however, the absence of the personnel responsible for completing the questionnaire in 2 companies reduced the number of interviews to 21. The purpose of this final stage of the survey was to examine some of the detailed aspects of transfer pricing which would have been difficult to incorporate in the questionnaire. Companies which were visited co-operated fully by making their senior personnel available and by their willingness to discuss and justify the policies adopted for transfer pricing.

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<sup>4</sup>These interviews were made possible by the financial assistance towards travelling expenses provided by a research grant from the University Grants Committee.

APPENDIX II : THE PRELIMINARY QUESTIONNAIRE

CONFIDENTIAL

To: G. M. McNally,  
Department of Accountancy,  
University of Canterbury,  
Private Bag,  
Christchurch.

PRELIMINARY INQUIRY ON TRANSFER PRICING

Name of company:

\_\_\_\_\_

Officer's name and  
address for future  
correspondence:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please strike out the alternative in the statement below which does not apply to your organization:

This company or group of companies  
make use of transfer pricing.

DOES  
 DOES NOT

Would you please state whether your company or group of companies is willing to participate in this research project by receiving my questionnaire:

\_\_\_\_\_

APPENDIX III : QUESTIONNAIRE ON TRANSFER PRICING

CONFIDENTIAL

To: G.M. McNally,  
Department of Accountancy,  
University of Canterbury,  
Private Bag,  
Christchurch.

QUESTIONNAIRE ON TRANSFER PRICING

Name of company: \_\_\_\_\_

Name of officer completing  
this questionnaire: \_\_\_\_\_

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COMPANY CHARACTERISTICS

1. Of the industry groups listed below, please indicate the one which most accurately describes the activities of your organization:

Chemicals, Drugs.

Foodstuffs, Tobacco.

Textiles, Clothing.

Engineering, Metalworking.

Vehicle Manufacture.

Home Appliances, Consumer Goods.

Forestry, Pulp and Paper.

Retail Stores.

Finance.

Diversified (use only as a last resort).

\*Others (specify): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_


\*If your organization has any major activities not covered in the above list, would you please state these.



APPENDIX III continued

2. Would you state, as an indicator of the size of your organization, the following figures as at last balance date:

- (a) Total Assets \$ \_\_\_\_\_ to nearest \$10,000.
- (b) Shareholders' Funds \$ \_\_\_\_\_ to nearest \$10,000.
- (c) Employees \_\_\_\_\_ approximately.

3. (a) What has been the basis for establishing divisions in your organization? (Where more than one basis has been used please indicate by numbering 1st, 2nd, 3rd, etc. the order of importance.)

Product lines  
(individual products or types of products become separate divisions)

Functional areas  
(for example, buying, selling and manufacturing)

Process Departments  
(individual operations within the manufacturing process, such as a foundry, a painting division or an assembly division)

Geographical areas

Companies acquired  
(companies acquired generally become separate divisions)

Any other basis (specify):

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APPENDIX III continued

(b) The percentages listed below are intended to indicate the percentage of any division's production which passes to another division within the organization, rather than being directly sold outside the organization. Please state the number of divisions that fit within each percentage range.

<u>Percentage of a division's production passing to another division:</u>	<u>Number of divisions falling within this percentage range:</u>
Less than 1%	<input type="text"/>
1 - 5%	<input type="text"/>
6 - 10%	<input type="text"/>
11 - 20%	<input type="text"/>
21 - 40%	<input type="text"/>
41 - 60%	<input type="text"/>
61 - 80%	<input type="text"/>
81 - 100%	<input type="text"/>

(c) Does a division manager have the right to buy any of the raw materials, partly completed components or processes, required to manufacture his output, from outside the whole organization group when another division produces the same raw material, partly completed component, or carries out the same process?

Always	<input type="checkbox"/>
Frequently	<input type="checkbox"/>
Sometimes	<input type="checkbox"/>
Only in special cases	<input type="checkbox"/>
Never	<input type="checkbox"/>

(d) May any division manager, other than of a normal selling division, sell or offer the output of his division outside the whole organization group when another division could use it?

Always	<input type="checkbox"/>
Frequently	<input type="checkbox"/>
Sometimes	<input type="checkbox"/>
Only in special cases	<input type="checkbox"/>
Never	<input type="checkbox"/>

APPENDIX III continued

4. With each of the following factors, indicate which of the degrees of control listed any division manager could exercise:

<u>FACTORS</u>	<u>DEGREE OF CONTROL</u>				
	Total Control	Predominant Control	Partial Control	Little Control	No Control
<u>Raw Materials:</u>					
Source of purchase	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Price to be paid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Type or quality of materials purchased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Labour:</u>					
Rates paid (when they exceed the ruling rate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right to hire and to dismiss - factory level employees - other employees in division	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Payment of or alteration to bonus and other incentives paid to - factory level employees - other employees in division	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Production:</u>					
The design of products or components comprising his output	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The actual mix of products or components his division produces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The level of production in his division as measured by units produced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Expenditure on land, building, machinery or other equipment:</u>					
0 - \$ 100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$101 - \$ 500	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$501 - \$ 1,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$1,001 - \$ 5,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
\$5,001 - \$10,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Higher than \$10,000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX III continued

NOTE: Transfer pricing is the technical name given to the 'prices' at which partly or fully completed products or components are transferred between the divisions of an organization during stages in the production and distribution process.

5. (a) For what purposes does your company use transfer prices it establishes?

- (i) As part of the process of evaluating the performance of divisions?
- (ii) As part of the procedure to encourage, guide or motivate managers of divisions?
- (iii) To determine the final cost or selling price of a product and a basis of valuing partly completed items of inventory?
- (iv) To aid the making of decisions, e. g. capital expenditure, product development, to make or buy a component, or to expand, modify or close a division?
- (v) Others (specify): \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(b) How would you rank the importance of setting transfer prices from the viewpoint of the whole organization? Please indicate this for each of the purposes you use transfer prices.

	Very Impor- tant	Impor- tant	Minor Impor- tance	Of no Impor- tance
Evaluate the performance of a division	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To encourage, guide or motivate a division manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To determine the cost of a partly or fully completed product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As an aid in the making of various decision types	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (specify): _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX III continued

6. (a) On what basis does your organization establish the transfer price it uses? Indicate this for each of the purposes stated in the previous question.

	I*	II*	III*	IV*	V*
<u>Variable Cost</u> (i. e. material and labour directly associated with a product, component or process)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Full or Total Cost</u> (i. e. all the costs relating to the production of a component, product or process)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Full Cost plus a percentage mark up</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Market Price</u> (i. e. the price at which a fully or partly completed product or component could be obtained from, or a process carried out by a firm outside the organization)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>Negotiated Price</u> (i. e. the price that results from discussion between the managers concerned with a transfer)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other basis (specify): _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- I\* Evaluate the performance of a division.
- II\* Encourage or guide a manager.
- III\* Determine the cost of a partly or fully completed product.
- IV\* Aid in decision making.
- V\* Others.

APPENDIX III continued

(b) If a cost basis is used in transfer pricing, is it -

Standard Cost

Actual Cost

Other (specify):


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(c) If cost plus a mark up basis is used, what method is used to calculate the mark up to be added to the cost figure?

A fixed \$ amount per unit

Fixed percentage added to cost  
(same % for all divisions)

Percentage added to cost that  
varies with divisions

Any other (specify):

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(d) If the transfer price is based on market price, is some allowance or reduction in the price made to recognize that lower promotion, packaging and distribution costs will be incurred when internal transfers occur?

Always

Frequently

Sometimes

Only in special cases

Never


APPENDIX III continued

EVALUATION OF DIVISIONS

7. (a) Which, if any, of the reasons listed below were important when initially deciding to evaluate the activities of divisions?  
(Where more than one reason was important, please rank in order, i. e. 1st, 2nd, 3rd, etc.)

Size of operations of the organization

Enable an assessment of the profitable activities

Geographic isolation of divisions

Need to control cost increases

Means of providing encouragement to division managers

Result of a merger

From the results in other firms

On the advice of a consultant

Merely an offshoot of financial accounting

Other (please specify): \_\_\_\_\_


(b) When divisions are evaluated as profit centres, what aspects of their results are used as a basis for evaluation?

Sales (both to other divisions and to external parties)

- Actual \$ amount

- Actual increase in \$ amount

- Percentage increase in \$ amount


Profit

- Actual \$ of any division

- Growth in \$ amount

- Percentage growth in profit


Return on the Assets of the division

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APPENDIX III continued

(c) Is there any distinction made between the profit, sales or return on assets figures arising from transfers to another division and those resulting from transactions with parties outside the organization when evaluating a division?

YES	
NO	

(d) If a profit figure of any sort is used to evaluate a division, are only those expenses controllable by that division manager deducted from sales?

YES	
NO	

(e) Would you indicate if your organization uses any of the following means or incentives in an attempt to guide or motivate a manager to improve the results of his division.

	I*	II*	III*	IV*
Increase in salary				
Payment of bonus				
Share options				
Shares fully or partly paid				
Others (specify): _____				
_____				
_____				

I\* Based on an increase in the sales, profit or return on assets of the whole organization.

II\* Based on an increase in the sales, profit or return on assets of his division.

III\* Using some other basis, please specify: \_\_\_\_\_  
 \_\_\_\_\_

IV\* No definite or consistent basis.



APPENDIX III continued

(f) Does your organization evaluate service\* divisions?

YES

NO


\*NOTE: For the purposes of this question the following classification indicates what is meant by a service and a production unit -

Production

Purchasing.

Sales.

All divisions directly concerned with the manufacturing processes.

Service

Personnel.

Accounting.

Research and Development.

(g) If the answer to (f) above is YES, do you attempt to have each service division make a profit or recover its costs by making a charge to production divisions using its services?

YES

NO


8. (a) Has any attempt been made to find whether an output, similar to that produced by any division, is available from outside the organization?

YES

NO


(b) With any division is its output or a very similar output available from a market outside the organization group?

Always

Frequently

Sometimes

Only in few cases

Never


APPENDIX III continued

(c) Where the production in any division requires components, assemblies, or other forms of output from other divisions, does the organization normally investigate the cost or price at which these components and assemblies could be obtained from manufacturers outside the organization?

YES

NO
