

**AN ANALYSIS OF TRANSFER PRICING THEORY AND AN INVESTIGATION INTO  
THE DOMESTIC TRANSFER PRICING  
PRACTICES OF LARGE LISTED SOUTH AFRICAN INDUSTRIAL COMPANIES**

by

Imtiaz A.S. Vally

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Supervisor : Professor Dr C. Ndu

Co-supervisor : Professor D. Clulow

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## ABSTRACT

An analysis of transfer pricing theory reveals that there are three main objectives of a transfer pricing system: the attainment of goal congruence, the facilitation of fair divisional performance evaluation and the promotion of divisional autonomy. A critical evaluation of suggested theoretically correct transfer pricing methods suggests that the simultaneous attainment of all three objectives is a difficult goal to be realised by a single transfer pricing method. The most appropriate method to suit a particular set of circumstances is contingent upon those circumstances.

The transfer pricing objective considered most important in practice by large listed South African industrial companies is the facilitation of fair divisional performance evaluation. Objectives relating to simplicity and ease of application are also rated more highly than goal congruence. Both these findings are somewhat surprising based on the review of current literature.

The domestic transfer pricing methods used by large listed South African industrial companies are fairly evenly split between cost and non-cost-oriented methods. The most frequently used primary transfer pricing method is market price. The use of mathematical programming and economic marginal cost prices is practically non-existent. These findings are consistent with the findings of some recent overseas studies.

Policies relating to the selection of the transfer pricing method, the purchase of intermediate goods and services and the settlement of transfer pricing disputes reflects some head office management involvement in the transfer price decision process in most cases.

Three organisational variables appear to have a significant association with a firm's choice of transfer pricing method. Firstly, companies with a low level of interdivisional trading use non-cost-

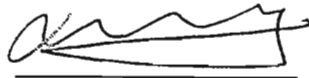
oriented transfer pricing methods whereas companies with a high level of interdivisional trading use cost-oriented methods. Secondly, transfer pricing methods selected as a result of some head office management involvement tend to be cost-oriented whereas methods selected by the divisions themselves tend to be non-cost-oriented. Thirdly, cost-oriented methods tend to be used in companies in which transfer pricing disputes are normally settled by some form of head office intervention and non-cost oriented methods are used in those companies in which disputes are normally settled by the divisions themselves.

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I certify that this entire dissertation, unless specifically indicated to the contrary in the text, is my own original work.

A handwritten signature in black ink, appearing to read 'Imtiaz A.S. Vally', written over a horizontal line.

Imtiaz A.S. Vally

<b>CONTENTS</b>		<b>Page</b>
LIST OF TABLES		vii
LIST OF DIAGRAMS		x
CHAPTER		
1	INTRODUCTION	
	1.1 Introduction	1
	1.2 Statement of the problem	1
	1.3 Objectives of the study	2
	1.4 Research methodology	3
	1.5 Structure of the dissertation	4
	1.6 Potential contributions of the study	4
	1.7 Limitation of scope	5
	1.8 Limitations of the research findings	5
	1.9 References	7
2	AN ANALYSIS OF TRANSFER PRICING THEORY	
	2.1 Introduction	8
	2.2 The theoretical objectives of a transfer pricing system	8
	2.3 The primary objective of a transfer pricing system	13
	2.4 A summary of suggested theoretically correct transfer pricing methods	13
	2.5 Economic marginal cost method	13
	2.6 Variable plus fixed cost method	32
	2.7 Opportunity cost method	37
	2.8 Incremental cost method	49
	2.9 Cost plus an allowance for profit method	58
	2.10 Market price method	63

2.11 Negotiated price method	75
2.12 Dual price method	79
2.13 Mathematical programming methods	82
2.14 Purpose based method	83
2.15 Conclusion	87
2.16 References	88

### 3 A REVIEW OF RECENT EMPIRICAL STUDIES INTO TRANSFER PRICING PRACTICES

3.1 A summary of recent empirical studies into transfer pricing practices	91
3.2 Finnie (1978)	92
3.3 Choudhury (1979)	94
3.4 Tang (1979)	96
3.5 Wu & Sharp (1979)	102
3.6 Benke & Edwards (1980)	104
3.7 Borkowski (1988)	107
3.8 Geboers, et al (1989)	112
3.9 Tang (1993)	118
3.10 Conclusion	120
3.11 References	122

### 4 EMPIRICAL RESEARCH DESIGN AND METHODOLOGY

4.1 Objective of the empirical investigation	123
4.2 Research design	123
4.3 Data collection techniques	124
4.4 Population definition	125
4.5 Questionnaire design	125
4.6 Pilot testing	129

	4.7 Final survey	130
	4.8 Overall response	131
	4.9 References	132
5	EMPIRICAL RESEARCH FINDINGS	
	5.1 Introduction	133
	5.2 Characteristics of the respondent firms	133
	5.3 Transfer pricing objectives	145
	5.4 Transfer pricing methods	149
	5.5 Other policy issues	157
	5.6 Identification of hypotheses	163
	5.7 Identification of the appropriate statistical test	163
	5.8 Hypotheses testing	165
	5.9 Conclusion	171
	5.10 References	173
6	CONCLUSION	
	6.1 Summary of findings	174
	6.2 Limitations of the research	174
	6.3 Areas for future research	175
	6.4 Reference	177
	BIBLIOGRAPHY	178
	APPENDIX A: Pilot Survey Questionnaire	183
	APPENDIX B: Follow-up Letter	190
	APPENDIX C: Detailed Chi-square Tests	191

## LIST OF TABLES

Table	Page
2.1      Summary of suggested theoretically correct transfer pricing methods	14
3.1      Summary of recent empirical studies covering domestic transfer pricing practices	91
3.2      The primary purpose of the transfer pricing systems used by respondent firms - Finnie (1978)	92
3.3      Transfer pricing procedures (methods) used by respondent firms - Finnie (1978)	93
3.4      Transfer pricing methods used by respondent firms - Choudhury (1979)	95
3.5      Dominant transfer pricing objectives of U.S. and Japanese companies - Tang (1979)	97
3.6      Domestic transfer pricing methods used by respondent firms - Tang (1979)	99
3.7      Dominant transfer pricing methods used by respondent firms - Tang (1979)	100
3.8      The rankings of transfer pricing objectives - Wu & Sharp (1979)	103
3.9      The rankings of transfer pricing systems - Wu & Sharp (1979)	104
3.10     Transfer pricing methods used by participating firms - Benke & Edwards (1980)	106
3.11     Domestic transfer pricing methods used by respondent firms - Borkowski (1988)	108
3.12     Environmental and organisational variables tested by Borkowski (1988)	110



3.13	The extent of use of transfer prices among respondent firms - Geboers, et al (1989)	113
3.14	Analysis according to size of companies using transfer prices - Geboers, et al (1989)	114
3.15	Analysis according to size of companies <b>not</b> using transfer prices - Geboers, et al (1989)	114
3.16	The objectives of transfer pricing methods used by respondent firms - Geboers, et al (1989)	115
3.17	Transfer pricing methods used when a market price is available - Geboers, et al (1989)	117
3.18	Transfer pricing methods used when a market price is not available - Geboers, et al (1989)	117
3.19	The use of transfer prices by industry - Tang (1993)	118
3.20	Number of domestic transfer pricing methods used by companies -Tang (1993)	119
3.21	Domestic transfer pricing methods used by the respondent firms - Tang (1993)	121
4.1	Industrial classification of population	126
4.2	Responses to the pilot survey	130
4.3	Responses to the final survey	131
4.4	Responses to both surveys	131
5.1	Industrial classification of the respondent firms	134
5.2	Size classification of respondent firms	135
5.3	Percentage interdivisional transfers	135
5.4	The extent of use of transfer pricing analysed by industry and in total	136
5.5	The extent of use of transfer pricing analysed by company size	140
5.6	The extent of use of transfer pricing analysed by the	

	level of interdivisional trading	140
5.7	Reasons for not using transfer pricing	143
5.8	Ranking of transfer pricing objectives	146
5.9	Distribution of respondents by dominant transfer pricing objective	147
5.10	Number of domestic transfer pricing methods used	149
5.11	Primary transfer pricing methods used by respondent firms	153
5.12	Secondary transfer pricing methods used by respondent firms	155
5.13	A comparison of primary transfer pricing methods used	156
5.14	A comparison of primary and secondary transfer pricing methods used	157
5.15	Responsibility for the selection of domestic transfer pricing methods	158
5.16	Outside purchase policy	160
5.17	How transfer pricing disputes are normally settled	160
5.18	Hypothesis 1: Company size and the orientation of domestic transfer pricing methods	167
5.19	Hypothesis 2: Level of interdivisional trading and the orientation of domestic transfer pricing methods	167
5.20	Hypothesis 3: The main transfer pricing objective and the orientation of domestic transfer pricing methods	168
5.21	Hypothesis 4: Responsibility for transfer price selection and the orientation of domestic transfer pricing methods	168
5.22	Hypothesis 5: Outside purchase policy and the orientation of domestic transfer pricing methods	169
5.23	Hypothesis 6: Manner of settling transfer price disputes and the orientation of domestic transfer pricing methods	169
5.24	Summary of statistical tests	170

## LIST OF DIAGRAMS

Diagram	Page
2.1 Perfect competition	15
2.2 Imperfect competition	16
2.3 Single joint output level	18
2.4 Monopolistic buyer	21
2.5 Constant marginal costs	23
2.6 Imperfect competition	25
2.7 Net marginal revenue curve	27
2.8 Imperfectly competitive intermediate market	29
2.9 Opportunity cost of supplying division	42
2.10 Opportunity cost of receiving division	44
2.11 Optimal transfer price	45
2.12 Less than optimal transfer quantity	48
2.13 Perfectly competitive intermediate market	65
2.14 Different divisional output levels	67
5.1 Transfer price usage in total	138
5.2 Transfer price usage by industry	139
5.3 Transfer price usage by company size	141
5.4 Transfer price usage by level of interdivisional trading	142
5.5 Reasons for not using transfer pricing	144
5.6 Dominant transfer pricing objective	148
5.7 Number of transfer pricing methods used	150
5.8 Primary transfer pricing methods used	152
5.9 Secondary transfer pricing methods used	154
5.10 Responsibility for the selection of transfer pricing methods	159
5.11 Outside purchase policy	161
5.12 Settlement of transfer price disputes	162

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 INTRODUCTION**

The **transfer price** is the price attached to the interdivisional transfers of goods and services in a divisionalised group. As such it influences the revenues of the selling division and the expenses of the receiving division and thus has a direct bearing on the reported profits of the divisions engaged in interdivisional trading. This in turn affects divisional performance evaluation and managerial incentive bonuses. Various authors have suggested different methods of determining an appropriate transfer price bearing in mind the objectives of group profit maximisation, fair divisional performance evaluation and the promotion of divisional autonomy.

Generally the consolidated group profit will not be affected by the choice of transfer pricing method but the allocation of that profit between the divisions will vary, depending on the level of the transfer price. Hence divisional managers of companies with substantial interdivisional trading consider transfer pricing to be very important from a divisional perspective.

The level of the transfer price however is also important from a group perspective. If the intermediate market is characterised by imperfect competition, an inappropriately chosen transfer price could result in a divisional manager maximising his own profit at the expense of overall group profit maximisation. This could occur if, for example, an increase in the transfer price caused the buying division to demand fewer quantities of the intermediate product causing the supplying division to sell excess quantities of the intermediate product at a distress price in the external market, to the detriment of the group as a whole. It is therefore critical that the transfer pricing method used within a group of companies is carefully considered.

### **1.2 STATEMENT OF THE PROBLEM**

In a comprehensive discussion on the theory of transfer pricing, Thomas (1980) makes reference to

a statement made by Seed (1970) to the effect that the accounting topic of transfer pricing singularly consumes more management time and energy than any other accounting problem. In a study carried out by Benke & Edwards (1980) all interviewees indicated that they considered transfer pricing to be important, with the majority referring to transfer pricing as very important.

Despite the importance of the topic however, there have been relatively few comprehensive empirical studies carried out in the area of transfer pricing. For example, in a review of empirical studies into transfer pricing practices conducted during the period 1974 to 1983, Grabski (1985) indicates that only two studies surveyed more than a hundred corporations at one time.

Whilst subsequent studies carried out overseas may have addressed this deficiency internationally (for example Borkowski (1988) and Tang (1993)), the criticism still applies within a South African context. The only South African empirical study of any note is one carried out by Geboers, et al (1989). This study however summarises data obtained from only nineteen companies listed on the Johannesburg Stock Exchange and is therefore classified as being exploratory rather than comprehensive. A widespread study into the transfer pricing practices of South African companies is therefore lacking and this study represents an attempt to address this deficiency.

### **1.3 OBJECTIVES OF THE STUDY**

The objectives of this study are:

1. To analyse the theory of transfer pricing.
2. To review past empirical studies into the domestic transfer pricing practices of overseas and South African companies.
3. To present for the first time, comprehensive data on the domestic transfer pricing practices of large listed South African industrial companies. In particular, data was gathered on the transfer pricing methods used by these companies, the objectives of these companies' transfer pricing systems and other policy issues surrounding transfer pricing, such as the responsibility for choosing the transfer pricing method and the manner of settling disputes.

## **1.4 RESEARCH METHODOLOGY**

The research methodology of this study may be classified as both analytical and empirical. The analytical part of the study is directed toward the attainment of objectives one and two identified above. For this purpose a review of the literature on transfer pricing available at the library of the University of Natal, Pietermaritzburg was carried out. Additional literature was sourced from other institutions using the inter-library loan facility. A printout of the Human Sciences Research Council database relating to completed higher degree research studies into transfer pricing was also obtained. In addition the Sabinet database was also searched for relevant literature. Full details of the literature reviewed are provided at the end of each chapter and in a bibliography at the end.

Empirical research methodology was adopted with a view to attaining the third objective of the study indicated above. Since the objective of the empirical analysis was to obtain comprehensive data from a large number of companies the case study approach was considered impractical and a statistical study was opted for. The population tested consisted of the 279 largest listed South African industrial companies identified in the June 1996 edition of the Financial Mail Special Survey of Top Companies. Data from these companies was obtained by means of a questionnaire survey. The questionnaire was mailed to the financial director of each company.

A pilot study was conducted to identify any weaknesses in the design of the questionnaire and to assess the feasibility of conducting a full-scale study. All non-responses were followed up with a second mailing. The pilot study did not reveal any serious deficiencies in the design of the questionnaire and the response rate of 60% indicated that a full-scale study was feasible. For the purposes of the full-scale study all remaining companies in the population were circularised. Again non-responses were followed up via a second mailing. A response rate of 46% was achieved for the full-scale study.

To assist in data analysis and interpretation, the raw data were summarised in tabular format. For the purposes of this tabulation mathematical techniques such as relative and absolute frequencies, and proportional analysis were employed. Graphical analysis in the form of pie and bar charts was also used to facilitate data interpretation. Ordinal data analysis was conducted using arithmetic mean calculations to rank the data.

Statistical chi-square testing was used to test the significance of hypothesised relationships between certain organisational variables and the orientation of the transfer pricing methods used by the respondent firms. For this purpose, data were arranged into contingency tables and chi-square values computed using Minitab, a statistical software package. Based on a comparison of computed chi-square values with critical test values selected from a chi-square distribution table, the hypotheses were either accepted or rejected.

## **1.5 STRUCTURE OF THE DISSERTATION**

The balance of this study is divided into five chapters. Chapters two and three relate to the literature review and may therefore be classified as being analytical in nature.

In chapter two, the theory of transfer pricing is analysed at a conceptual level. This analysis is necessary in order to obtain a sound theoretical understanding of the subject and represents the starting point of the study. Chapter three then proceeds with a review of the findings of recent empirical studies into the domestic transfer pricing practices of South African and overseas companies.

Chapters four and five relate to the accumulation and analysis of empirical data on the domestic transfer pricing practices of large listed South African industrial companies. As such these two chapters constitute the empirical part of the study. Chapter four describes the preliminary planning phase of the empirical study and details the empirical research methodology. Chapter five contains an analysis of the data obtained by means of the questionnaire survey and details the statistical tests carried out with a view to identifying potential relationships between variables. Chapter six concludes the study with a summary of the research findings and provides directions for future research.

## **1.6 POTENTIAL CONTRIBUTIONS OF THE STUDY**

Management accounting students and practitioners who wish to obtain a good technical grasp of transfer pricing theory will benefit from a study of chapter two which contains a comprehensive

analysis of transfer pricing theory. Chapters three, four and five deal with transfer pricing in practice and will therefore be of particular interest to practitioners who may wish to know what other companies' transfer pricing practices are. These chapters will also be of interest to students of management accounting who wish to obtain a practical perspective on transfer pricing. Chapter five also presents for the first time extensive data on South African domestic transfer pricing practices and to this extent represents a contribution to knowledge.

### **1.7 LIMITATION OF SCOPE**

This entire dissertation is set within the context of domestic transfer pricing theory and practice. The international dimensions of transfer pricing are not considered as the objective of the study is to analyse the subject of transfer pricing purely within the context of decentralised organisational structures based on the principles of goal congruence, divisional autonomy and the need to assess divisional performance. Support for such an approach can be found in Grabski (1985) and Borkowski (1988). In this regard Grabski (1985) maintains "multinational transfer pricing strategies are generally the result of both the regulations enforced by the various taxing authorities ... and the foreign exchange rates." Writings in this area "do not focus on the issues of decentralization and organisational optimisation is ignored." Borkowski (1988) states further that "the main impetus behind international transfer pricing comes from the tax effects of a transfer from an international subsidiary on the parent corporation. In firms using transfer pricing in domestic subsidiaries or divisions, taxes are of less concern. International transfer pricing is thus considered a separate topic."

### **1.8 LIMITATIONS OF THE RESEARCH FINDINGS**

1. As is common with all statistical studies, the results of the survey may not be extrapolated beyond the bounds of the population surveyed.
2. For the purposes of conducting the hypothesis testing certain organisational variables were identified for testing. It is possible that other more important variables impacting on a firm's choice



of transfer pricing method exist and have been ignored for testing (Borkowski 1988 52).

3. Although all questionnaire responses were reviewed for internal inconsistencies, it is nonetheless difficult to assess the validity of the survey responses. Not all responses were completed by the group financial director and it is therefore possible that the person completing the questionnaire may not in all cases be ideally suited to doing so.

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## **CHAPTER 2**

### **AN ANALYSIS OF TRANSFER PRICING THEORY**

#### **2.1 INTRODUCTION**

In this chapter transfer pricing theory is analysed at a conceptual level. The theory of transfer pricing may be divided into two parts as follows:

1. The theoretical objectives of a transfer pricing system.
2. Suggested theoretically correct transfer pricing methods designed to attain these objectives.

#### **2.2 THE THEORETICAL OBJECTIVES OF A TRANSFER PRICING SYSTEM**

The main objectives of a sound transfer pricing system may be summarised as follows. The transfer pricing system should:

- a) Facilitate goal congruence (Benke & Edwards 1980 18).
- b) Fairly reflect the performance of divisional management  
(Benke & Edwards 1980 18).
- c) Promote divisional autonomy (Thomas 1980 129).

Each of these will be discussed in turn.

##### **a) The facilitation of goal congruence**

The majority of companies operating in a market based economy have as their prime goal the maximisation of profit. In a divisionalised company the attainment of this objective is delegated to

divisional management and managerial performance is assessed based on divisional contribution to group profit.

Where interdivisional trading takes place, a buying division, in order to maximise its contribution to group profit, will attempt to pay the minimum price to the selling division whilst the selling division's behaviour would be the exact opposite. The transfer price settled on, given divisional autonomy, will be that which maximises the profits of each individual division relative to what could otherwise be achieved if the divisions did not trade with each other. In most cases this behaviour would coincidentally conform with the overall group objective of profit maximisation. In such a case the transfer price will be classified as being **goal congruent**.

There are however circumstances in which, because of the level of the transfer price applicable, divisional management may act in a manner which will maximise their individual contributions to group profit but which will not be consistent with the objective of group profit maximisation. In such a case the transfer price will be classified as **lacking** in the promotion of goal congruence (Benke & Edwards 1980 6). Consider the following example.

#### Illustrative example: Goal congruence

A company has two divisions, A and B. **Division A** operates at full capacity and sells 100 000 units of Product A annually. The product costs R8 to manufacture and is sold externally at R11 per unit.

**Division B** sells 50 000 units of Product B annually. The product costs R6 to manufacture and is sold externally at R8 per unit.

**Division B** also has spare capacity to process 100 000 units of Product A further into Product C which could then be sold externally at R20 per unit. Additional processing costs will amount to R2 per unit. Division B cannot purchase Product A in the outside market.

If Division A **does not supply** Division B with Product A, Division B will not be able to produce Product C. Under these circumstances overall group profit will appear as shown in Exhibit 1.

If Division A **does supply** Division B with 100 000 units of Product A at a **market based** transfer price of R11 per unit and Division B processes Product A further into Product C, overall group profit will be as shown in Exhibit 2.

---

**EXHIBIT 1****DIVISIONAL PROFIT STATEMENT - NO INTERDIVISIONAL TRADING**

	Division A	Division B	Group
	R	R	R
Sales	1 100 000	400 000	
Processing costs	<u>(800 000)</u>	<u>(300 000)</u>	
Profit	<u>300 000</u>	<u>100 000</u>	<u>400 000</u>

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**EXHIBIT 2****DIVISIONAL PROFIT STATEMENT - INTERDIVISIONAL TRADING**

	Division A	Division B	Group
	R	R	R
Existing profit	300 000	100 000	
Product C:			
Sales	-	2 000 000	
Processing costs	-	( 200 000)	
Transfer cost	<u>-</u>	<u>(1100 000)</u>	
Profit	<u>300 000</u>	<u>800 000</u>	<u>1 100 000</u>

---

Interdivisional trade in Product A at a transfer price of R11 per unit causes Division B's and the overall group profit to increase by R700 000. Division A is indifferent. Thus a transfer price of R11 per unit is considered **goal congruent** as it motivates Division B's management to act in a manner which promotes its and the group's economic well being.

Assume now that the company follows a policy of setting all transfer prices based on **cost plus**

10 %. Thus if Division A supplies Division B with 100 000 units of Product A, it will be transferred to Division B at R8.80 per unit. Overall group profit will be as shown in Exhibit 3.

---

**EXHIBIT 3**

**DIVISIONAL PROFIT STATEMENT - INTERDIVISIONAL TRANSFERS AT COST  
PLUS 10 %**

	Division A	Division B	Group
	R	R	R
Existing profit	300 000	100 000	
Reduction in existing profit			
100 000 * (R11-8.80)	(220 000)	-	
Product C:			
Sales	-	2 000 000	
Processing costs	-	(200 000)	
Transfer cost	-	<u>(880 000)</u>	
Profit	<u>80 000</u>	<u>1 020 000</u>	<u>1 100 000</u>

---

At a transfer price of R8.80 per unit, Division A will be disinclined to supply Division B with Product A since its profit will decrease by R220 000. However overall group profit has increased by R700 000 in relation to a situation of no interdivisional transfers. Thus if Division B is unable to source alternative supplies of Product A Division A, by not supplying Product A to Division B, will be acting in a manner which conflicts with group objectives. In order to maximise its own profits Division A is causing the group to lose R700 000 of additional profit. In such a case the transfer price based on cost plus 10 % will be considered to be **lacking** in the promotion of goal congruence.

#### b) Fair divisional performance evaluation

The transfer price used should **fairly** reflect the contribution of a division to group profitability. Profit distortions should be avoided. Too high a transfer price will overstate the contribution of the selling division and understate the contribution of the receiving division. Too low a transfer price will have the opposite effect (Benke & Edwards 1980 21). Such a distortion will demotivate divisional management if it considers itself prejudiced by the transfer pricing system. Resource mis-allocation could also result as resources are diverted away from the apparently less profitable division to the apparently more profitable division (Abdel-khalik & Lusk 1974 8).

An example of a case where the transfer pricing system will distort accurate performance measurement will be if a transfer price is set so as to minimise group taxation. Assume there are two subsidiaries within a group that trade with each other. The supplying subsidiary is in a tax paying position whilst the receiving subsidiary possesses an assessed loss. It is in the interests of the group for the transfer price to be set at as low a level as will be acceptable to the Receiver of Revenue so as to maximise group after tax profit. However if this price is lower than what the supplying division could obtain in the external market then the supplying division will be aggrieved that it is effectively forced to sell to the receiving division at a lower price. In such a case, although the transfer price promotes goal congruence it conflicts with the objective of accurate performance evaluation as the supplying division is effectively subsidising the receiving division.

#### c) Promote divisional autonomy

"Decentralization is the delegation of a great deal of authority to the lowest level of management responsibility that can make important decisions" (Engler 1987 705). In order to promote divisional autonomy therefore, the determination of transfer prices in a decentralised corporation should be delegated to divisional management. Absolute delegation however could result in a division selfishly making decisions which maximises its own profits but results in a suboptimal decision for the organisation as a whole (Solomons 1965 166). To the extent that head office steps in to correct the

situation, divisional autonomy and its attendant motivational advantages are compromised.

## **2.3 THE PRIMARY OBJECTIVE OF A TRANSFER PRICING SYSTEM**

From the discussion thus far, it is apparent that conflicts could easily arise between the simultaneous attainment of the three main objectives of a sound transfer pricing system identified above. Where conflicts arise between the simultaneous attainment of all three objectives it appears that in practice attainment of the objective of group profit maximisation takes precedence (Abdel-khalik & Lusk 1974 9).

Academics however maintain "that a conflict between the objectives of each division and the organisation comprising the divisions will not exist if a proper model is implemented. Hence academic interest has centred on presenting a set of rules that integrate the complex elements of the organisation in order to allow for divisional autonomy while recognising global organisational goals" (Abdel-khalik & Lusk 1974 9).

The discussion will now turn to a consideration of these rules and an assessment of the extent to which they comply with the above objectives.

## **2.4 A SUMMARY OF SUGGESTED THEORETICALLY CORRECT TRANSFER PRICING METHODS**

Table 2.1 summarises the various transfer pricing methods which have been proposed by writers in the past. In the following sections each of these theories will be analysed and critically evaluated.

## **2.5 ECONOMIC MARGINAL COST METHOD**

### **1. Basic economic theory**

"The principal contributor to the theory of transfer pricing is economist Jack Hirshleifer" (Benke & Edwards 1980 139). Hirshleifer based his transfer pricing theory on the basic economic theory of



Table 2.1 Summary of suggested theoretically correct transfer pricing methods

<u>Suggested Methods</u>	<u>Principal Contributors</u>
1. Cost price methods	
A. Economic marginal cost	Hirshleifer
B. Variable plus fixed cost	Vendig
C. Opportunity cost	Onsi; Holstrum and Sauls
D. Incremental cost	Goetz
E. Cost plus	Gordon; Vendig
2. Market price method	Hirshleifer; Cook
3. Negotiated price method	Fremgen
4. Dual price method	Edwards and Roemmich
5. Mathematical programming methods	Baumol and Fabian
6. Purpose based method	Bierman

Source: Adapted from Tang, Roger Y W. 1979. *Transfer Pricing Practices in the United States and Japan*. New York:Praeger. 10.

marginal revenue (increase in total revenue attributable to the sale of one additional unit) and marginal cost ( increase in total cost attributable to the production of one additional unit). In general terms, this theory states that a firm will maximise its profits by expanding output upto the point where marginal revenue equals marginal cost. Expanding output beyond the point of intersection of the marginal revenue and marginal cost curves is inadvisable as the cost associated with the production of an additional unit exceeds the revenue that will be derived from the sale of that unit. This is graphically depicted in the Diagrams 2.1 and 2.2.

Diagram 2.1 depicts a situation where the firm sells its product in a perfectly competitive market. In such a situation because the firm is unable to influence the selling price of its product, marginal revenue (ie. the increase in total revenue attributable to the sale of one additional unit) will

# Perfect competition

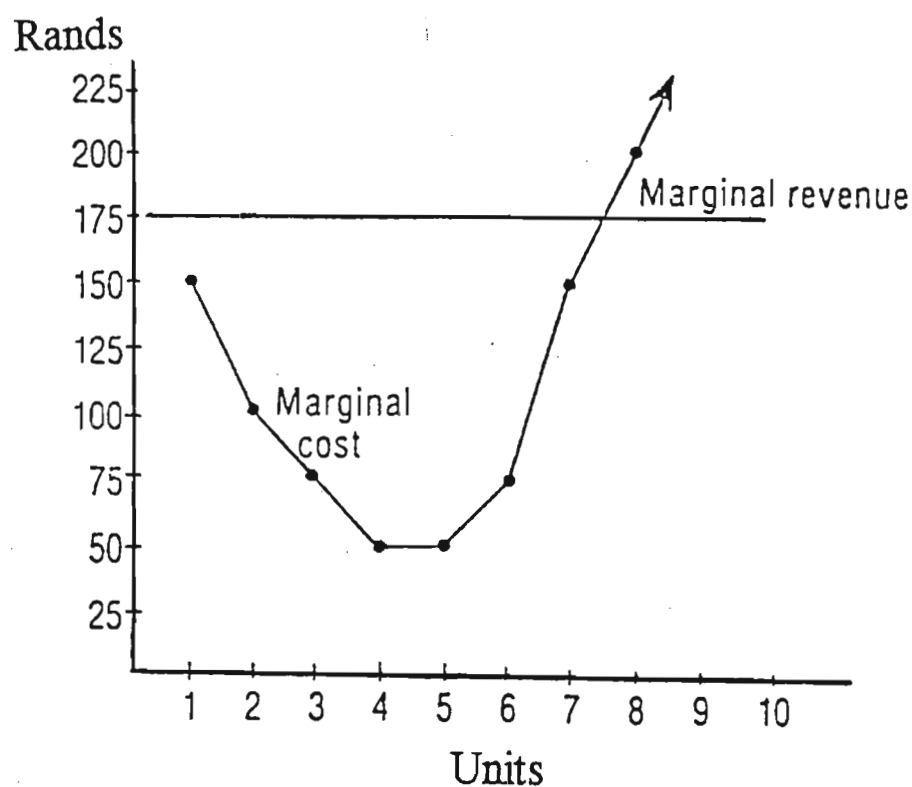


Diagram 2.1

Source: Benke, Ralph L., Jr and James Don Edwards. 1980. *Transfer Pricing: Techniques and Uses*. New York: National Association of Accountants. 63.

# Imperfect competition

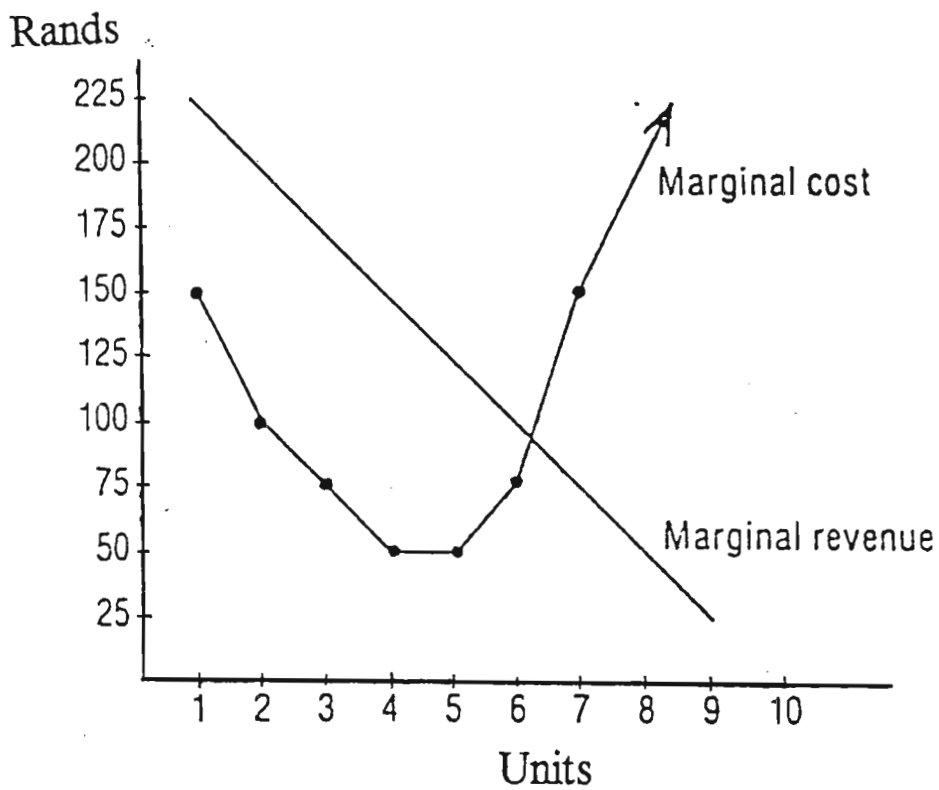


Diagram 2.2

Source: Benke, Ralph L., Jr and James Don Edwards. 1980. *Transfer Pricing: Techniques and Uses*. New York: National Association of Accountants. 63.

always equal the price of the product. Hence the marginal revenue curve is flat at the level of the price of the product (R175).

After declining initially, the marginal cost curve turns upward. The point at which the marginal cost curve intersects the marginal revenue curve establishes the point of optimal output (approximately 7.5 units in this case).

Diagram 2.2 depicts a situation where the firm sells its product in an imperfect market. In this case the downward sloping nature of the marginal revenue curve is influenced by the fact that in an imperfect market a firm is forced to reduce its selling price in order to sell additional units. There is therefore an inverse relationship between output and marginal revenue. As sales increase the selling price per unit (and marginal revenue) decreases. The point at which the marginal cost curve intersects the marginal revenue curve establishes the point of optimal output (approximately 6.5 units in this case). Bearing these principles in mind let us now consider the transfer pricing theories developed by Hirshleifer.

## **2. Determining the transfer price and output level where the selling division sells all its output to the receiving division**

The first situation that Hirshleifer (1956,1964) considers is the determination of an appropriate transfer price where the selling division (Division A) sells **all** its output to the buying division (Division B). The selling division may be forced to do so because there is **no intermediate market** for its product or a state of technological dependence exists between the two divisions which makes it uneconomical for either division to deal externally as far as the intermediate product is concerned. A single joint output level is therefore to be determined for both the buying and selling divisions simultaneously so as to maximise the firm's profit. This is graphically represented in Diagram 2.3.

Diagram 2.3 depicts the situation in which Division A sells the intermediate product to Division B which on-sells the product in the final external market. McA represents the marginal cost curve of Division A. McB represents the marginal cost curve of Division B. McC represents the sum of Division A's and Division B's marginal cost curves. MrF represents the marginal revenue curve of Division B and the firm (perfect competition).

# Single joint output level

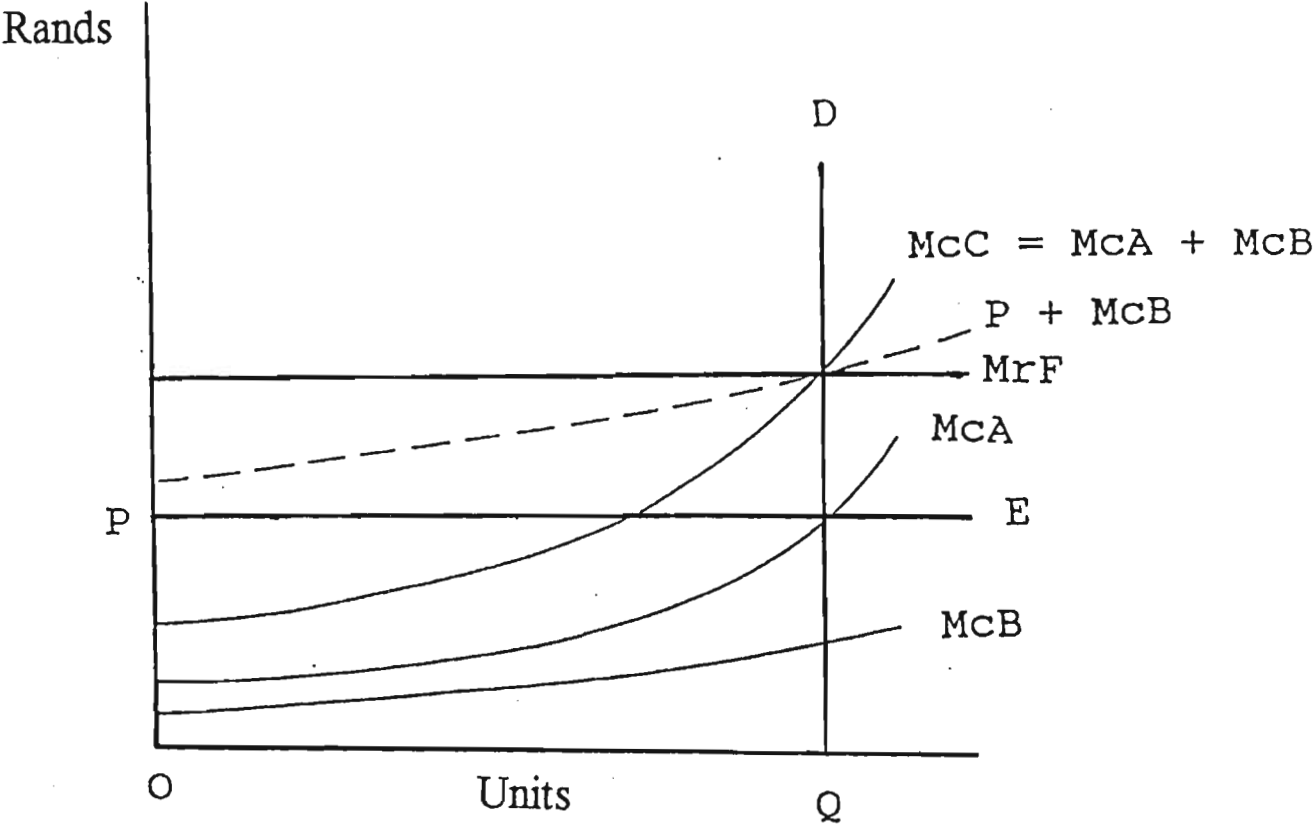


Diagram 2.3

Source: Adapted from Hirshleifer, Jack. 1964. Internal Pricing and Decentralized Decisions. In *Management Controls: New Directions in Basic Research*. Bonini, Jaedicke, and Wagner (editors), New York:Mc Graw Hill, Inc. 31.

The point of intersection of MrF and McC determines the optimal output level in order to maximise the firm's profits. A vertical line (DQ) is drawn through this point of intersection to the horizontal axis. The point of intersection of this vertical line with the horizontal axis determines the common optimal output level for the two divisions (OQ in this case). The transfer price at which quantity OQ will be transferred from Division A to Division B is established graphically by drawing a horizontal line EP through the point of intersection of McA and DQ to the vertical axis. The point of intersection of this horizontal line with the vertical axis determines the appropriate transfer price (OP in this case). Thus the firm's profit will be maximised if Division A manufactures quantity OQ and sells it to Division B at price OP.

### **A critical appraisal of the economic marginal cost (single joint output level) transfer pricing method**

#### **a) Preserving divisional autonomy and achieving goal congruence**

The optimal joint output level could be centrally determined (no divisional autonomy) or one of the divisions could autonomously arrive at the same conclusion (partial divisional autonomy). In the latter case the buying division for example, could obtain from the supplying division a schedule indicating the quantity it would be willing to supply at different transfer prices. The buying division could then derive a net revenue curve (final market price minus transfer price) and determine the point of intersection of its net revenue curve with its marginal cost curve to determine its optimal output level. The quantity so arrived at would automatically coincide with that which would otherwise be arrived at centrally (ie. the buying division would demand quantity OQ at price OP in order to maximise its profits) (Hirshleifer 1956). But how do we know that the supplying division would be willing to sell quantity OQ at price OP in this case?

Refer to Diagram 2.3. If Division A sells all its output to Division B at transfer price OP the line PE will effectively represent Division A's marginal revenue curve. Thus from Division A's perspective profit will be maximised at quantity OQ by selling at price OP as this represents the point of intersection of its marginal revenue and marginal cost curves.

To confirm that Division B's profit is also maximised at quantity OQ, refer to Diagram 2.3

once more. Division B's overall marginal cost curve is represented by the dashed curve  $P + McB$  (ie. the cost of the transferred in product (OP) plus its own marginal costs.) Again quantity OQ represents the point of intersection of Division B's marginal revenue and cost curves and Division B itself maximises its profit at this level. Thus it would appear that the above transfer pricing method which permits partial divisional autonomy also achieves goal congruence as it maximises the firm's and divisional profit. There is one caveat to this however.

Given partial divisional autonomy Hirshleifer points out that there is incentive for the **decision making** division to adopt monopolistic tendencies in its buying (selling) decisions. Such behaviour would result in an individual division maximising its own profits to the detriment of firm wide profits thus frustrating goal congruence. Let us consider Diagram 2.4.

With reference to the Diagram 2.4,  $McC$ ,  $MrF$ ,  $McA$  and  $McB$  are as previously defined.  $Nr$  represents the net revenue curve of Division B and is arrived at by subtracting the marginal cost of producing the intermediate product from the final market price at each output level. The curve " $mr$ " is a quasi-marginal revenue curve marginal to  $Nr$ . The point of intersection of  $Nr$  and  $McB$  determines the optimal output level from Division B's perspective. Notice that this point of intersection occurs at the same output level at which  $McC$  intersects with  $Mrf$  (the firm wide optimal output level). Thus if Division B is given the autonomy to determine its optimal output level and does so based on its net revenue curve as already explained, the transfer pricing system would promote a measure of autonomy and simultaneously achieve goal congruence (quantity OL will be transferred at price ON). However should this autonomy be extended to permitting Division B to base its output decision by reference to the quasi-marginal revenue curve " $mr$ ", then Division B's actions would conflict with group-wide profit maximisation aspirations.

This would occur because Division B's profits would be maximised at the point of intersection of curves " $mr$ " and  $McB$  resulting in Division B demanding (and Division A supplying) quantity OR instead of OL at a transfer price of OU. The impact of this on group and divisional profit is summarised as follows:

**Group profit** - This is reduced to area MBWT from MBQ, a reduction of area TWQ.

**Division A** - Its profits are reduced from area NYD to area UYS, a reduction of NUSD.

**Division B** - Its profits are increased from area JGH to JKCZ.

# Monopolistic buyer

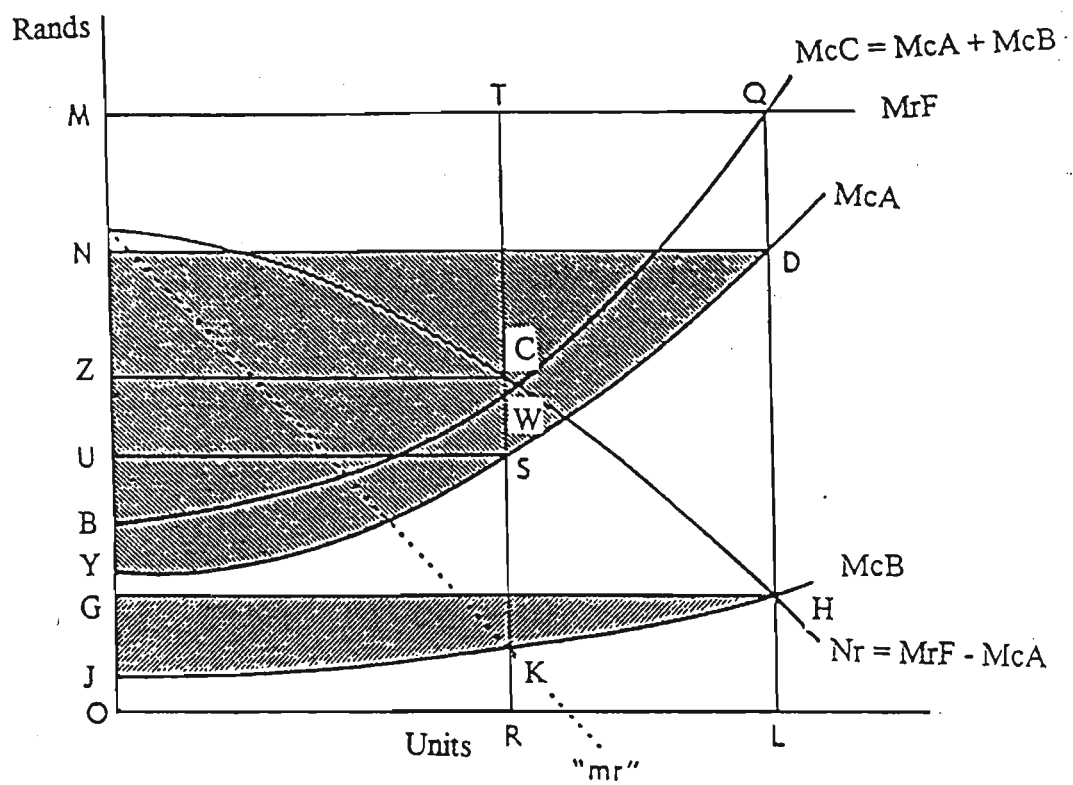


Diagram 2.4

Source: Adapted from Hirshleifer, Jack. 1956. On the Economics of Transfer Pricing. *Journal of Business* 29 (July):174.



Thus by permitting a measure of divisional autonomy without safeguarding against the propensity of a division to capitalise on its monopolistic position, the transfer pricing system for the determination of a single joint level of output as described above would not meet all the objectives of a sound transfer pricing system. Curtailing monopolistic behaviour dilutes autonomy while added autonomy militates against goal congruence.

The discussion above is based on the assumption of the receiving division being in charge of determining the joint level of output. The roles could however easily be reversed with autonomy being extended to the supplying division instead. The flaws inherent in the transfer pricing system as described above however apply equally to the latter situation.

It appears that authority to determine the joint level of output can be extended to one division only and the other division would have to follow suit for Hirshleifer (1956 175) states that "bilateral bargaining might lead to a rather poor solution in these circumstances". Thus only partial divisional autonomy is attainable under this method at best.

#### b) Fair divisional performance evaluation

Thomas (1980 265) considers the situation where a single joint level of output is to be determined and one of the divisions experiences **constant marginal costs**. Consider Diagram 2.5 which depicts a situation in which Division A's marginal cost curve is constant for all levels of output.

Firm profit will be maximised by establishing a joint output level of OQ (the point of intersection of McC and MrF) to be transferred from Division A to Division B at price OP. But OP equals Division A's marginal cost for all output levels so that Division A will in fact report zero profits and Division B's profits would equal the firm's profits. Thus the objective that a transfer pricing system should fairly reflect divisional managerial performance is not met if performance is to be assessed on the basis of profitability. A marginal cost based transfer pricing system in this case overstates Division B's contribution and understates Division A's contribution.

Conversely if Division B's marginal cost curve were constant and Division A's were rising Division B will report zero profits and firm profit will be attributable entirely to Division A (Thomas 1980 266).

## Constant marginal costs

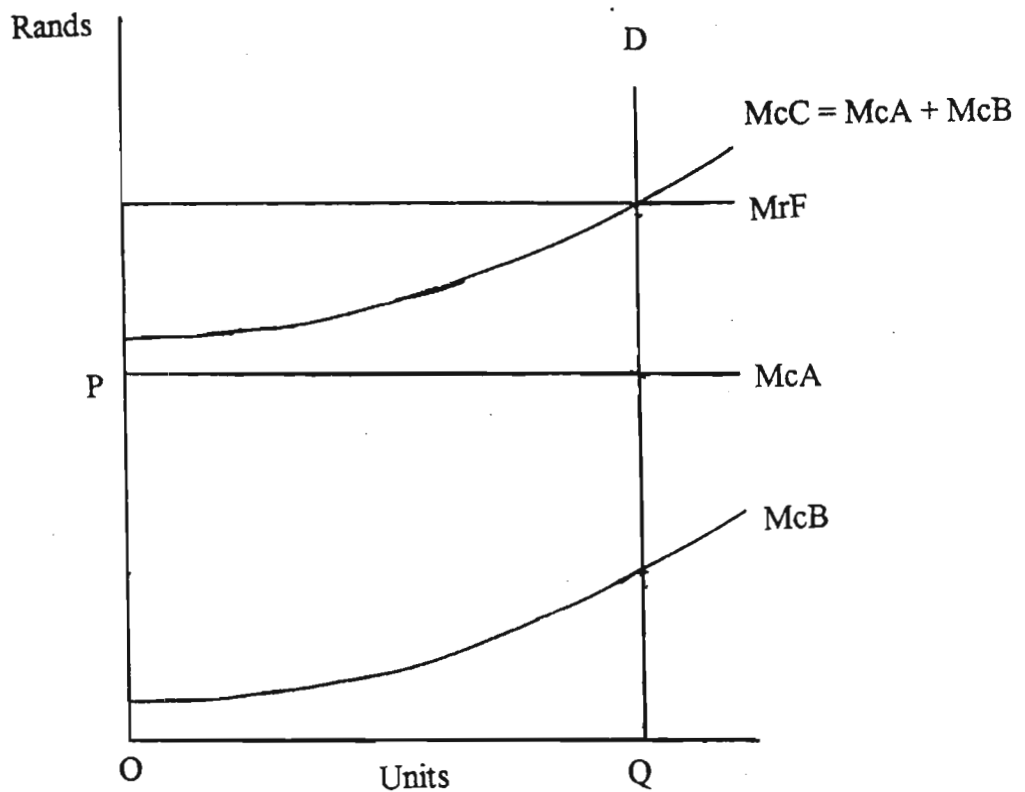


Diagram 2.5

Source: Adapted from Thomas, Arthur L. 1980. *A Behavioural Analysis of Joint-Cost Allocation and Transfer Pricing*. Champaign, Ill : Stipes Publishing Company.265.

Thomas further points out that to achieve fair divisional performance evaluation, a transfer pricing system should possess the following qualities:

- "1. Divisions should benefit from increases in their efficiencies and be penalized for decreases in their efficiencies.
2. Actions (or inactions) by one division shouldn't affect other division's profits. In particular, one division's profits shouldn't be affected by changes in another division's separate costs." (Thomas 1980 148)

Thomas (1980 148) then proceeds to present illustrations which prove that Hirshleifer's marginal cost approach lacks the above qualities. For example, he demonstrates that when the supplying division experiences an upward sloping marginal cost curve, decreases in its efficiency could actually decrease the receiving division's profits whereas increases in its efficiency can both increase the receiving division's profits and decrease its own profits. He also demonstrates that when the receiving division becomes less efficient the supplying division's profits could also be reduced. This susceptibility of marginal cost transfer pricing systems to allow events in one division to unilaterally affect the profitability of another division detracts from the objective of fair divisional performance evaluation.

### **Imperfectly competitive final market**

In Diagram 2.3 it is assumed that Division B sells its output in a perfectly competitive market (hence the flat marginal revenue curve). If Division B sold its output in an imperfectly competitive market all that would change in Diagram 2.3 is the slope of  $Mr_F$ , which would be downward sloping rather than flat. This is graphically represented in the Diagram 2.6. The method of determining the joint optimal output level and the corresponding transfer price remains unchanged.

Developing the analysis further necessitates a revision of the assumption that there is no intermediate market for the product of Division A.

# Imperfect competition

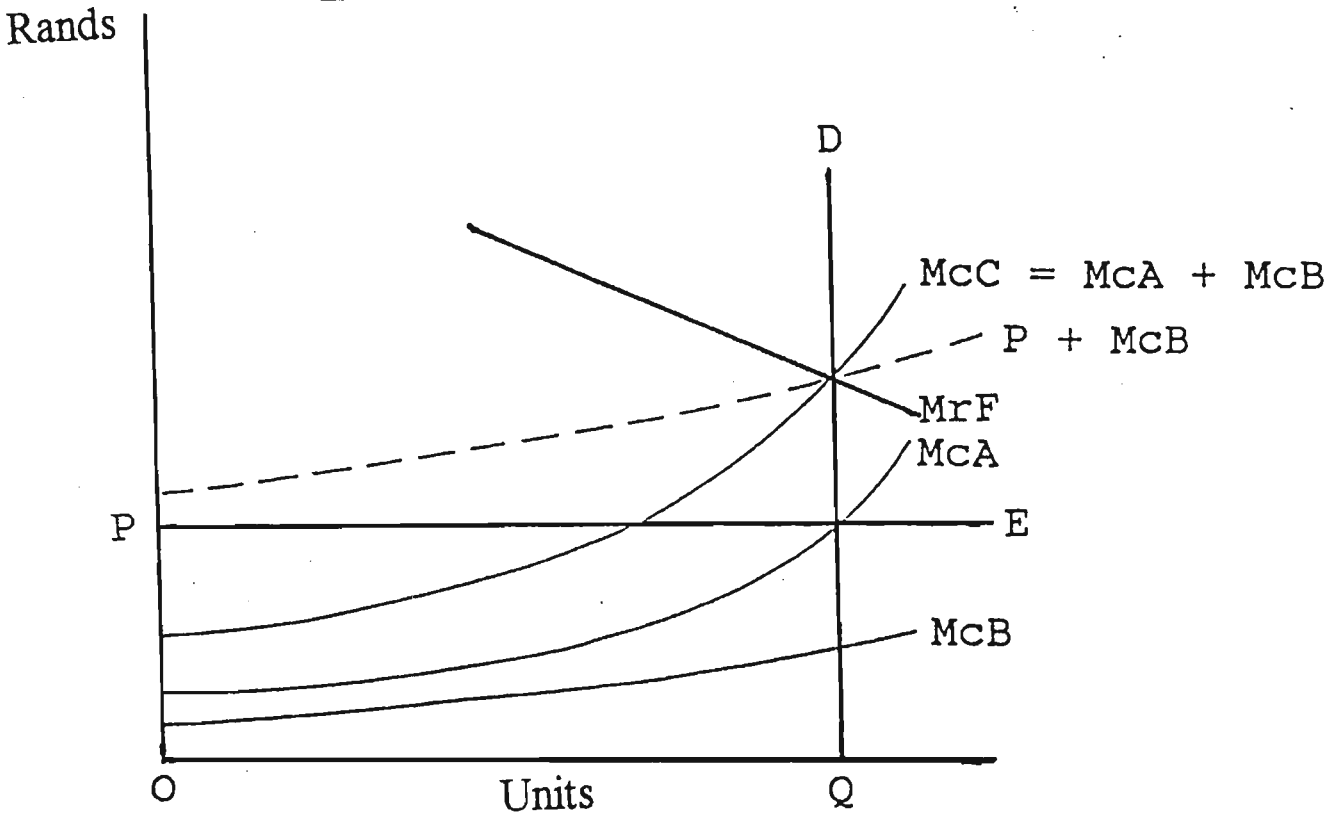


Diagram 2.6

Source: Adapted from Hirshleifer, Jack. 1964. Internal Pricing and Decentralized Decisions. In *Management Controls: New Directions in Basic Research*. Bonini, Jaedicke, and Wagner (editors), New York:Mc Graw Hill, Inc. 31.

### 3. Determining the transfer price and output level where the supplying division may sell externally in an imperfectly competitive intermediate market or internally

The scenario which envisages an **imperfectly competitive intermediate market** for the product of Division A is considerably more complex and is based on the assumption of **demand and technological independence** between the two divisions. By **demand independence** is meant that the quantity sold by the supplying division (Division A) in the external intermediate market will not affect the quantity sold by the receiving division (Division B) in its final external market. Conversely the quantity sold by Division B in its final external market does not influence the external demand in the intermediate market. **Technological independence** means that the production cost functions of both divisions are independent of the level of interdivisional trading.

For the sake of simplicity, Division A is assumed to be a monopolist as far as the supply of its product is concerned. Thus Division A has the option of selling its product in the intermediate market or to Division B. Division B has no option but to purchase its product from Division A as there is no alternative supplier. It is however not critical to the analysis whether the final market for Division B's product is perfect or imperfect.

The first step in the analysis requires the receiving division to determine its **net marginal revenue** at various output levels. For this purpose **net marginal revenue** is defined as the marginal revenue associated with the sale of the final product in the external market minus marginal cost. Assuming the final external market is imperfectly competitive, the net marginal revenue curve of the buying division is depicted in Diagram 2.7.

In Diagram 2.7  $Mc_B$  represents the marginal cost curve of Division B.  $DB$  represents the demand curve faced by Division B in the external market (assumed to be imperfectly competitive).  $Mr_B$  represents the marginal revenue curve derived from the demand curve  $DB$ .  $nMr_B$  represents the net marginal revenue curve of Division B (ie.  $Mr_B - Mc_B$ ).

# Net marginal revenue curve

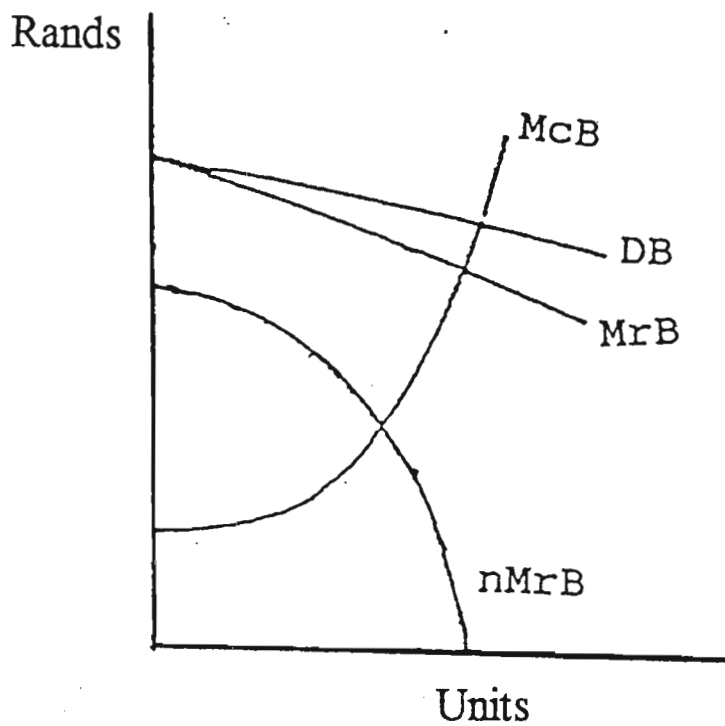


Diagram 2.7

Source: Adapted from Hirshleifer, Jack. 1956. On the Economics of Transfer Pricing.  
*Journal of Business* 29 (July):179.

The next step in the analysis calls for a summation, at each output level, of the net marginal revenue curve of Division B and the marginal revenue curve of Division A (which A derives by selling in an imperfectly competitive intermediate market) to arrive at  $\sum MR$ . The point of intersection of  $\sum MR$  and the marginal cost curve of Division A establishes the optimal firm wide level of output. This is graphically represented in Diagram 2.8.

In Diagram 2.8 DB,  $MrB$  and  $nMrB$  are as defined under Diagram 2.7. DA represents Division A's intermediate market demand curve (imperfect competition) and  $MrA$  is the marginal revenue curve derived from this demand curve.  $\sum MR$  is equal to  $nMrB$  plus  $MrA$ . If a line (AQ) is dropped from the point of intersection of  $McA$  (Division A's marginal cost curve) and  $\sum MR$  to the horizontal axis the point of intersection of this line with the horizontal axis establishes the amount Division A should produce in order to maximise the firm's profits (OQ in this case).

Similarly, if a horizontal line (AP) is drawn from the point of intersection of  $McA$  and  $\sum MR$  to the vertical axis, the point of intersection of this line with the vertical axis establishes the transfer price (OP in this instance). The number of units transferred from Division A at the transfer price OP is determined by the point of intersection of AP with  $nMrB$ . Thus Division B will purchase OL units from Division A at the transfer price OP. It therefore follows that the number of units to be sold externally in the intermediate market by Division A is  $OQ - OL$ , which is also equal to OK (the point of intersection of AP and  $MrA$ .) The price at which quantity OK will be sold in the intermediate external market will be established by reference to the intermediate market demand curve, DA (OR in this instance). As the demand curve will always lie above  $MrA$  it follows that the price at which quantity OK will be sold in the intermediate market will always be higher than the transfer price.

The general conclusion to be drawn from the above analysis therefore is that in a situation where the supplying division sells its product in two markets, the external intermediate market and internally, the internal transfer price will be lower than the intermediate market price. Had the transfer price been set at the intermediate market price, the supplying division would have oversupplied and the buying division would have underpurchased, leading to less than optimal firm profits (Benke & Edwards 1980 144).

## Imperfectly competitive intermediate market

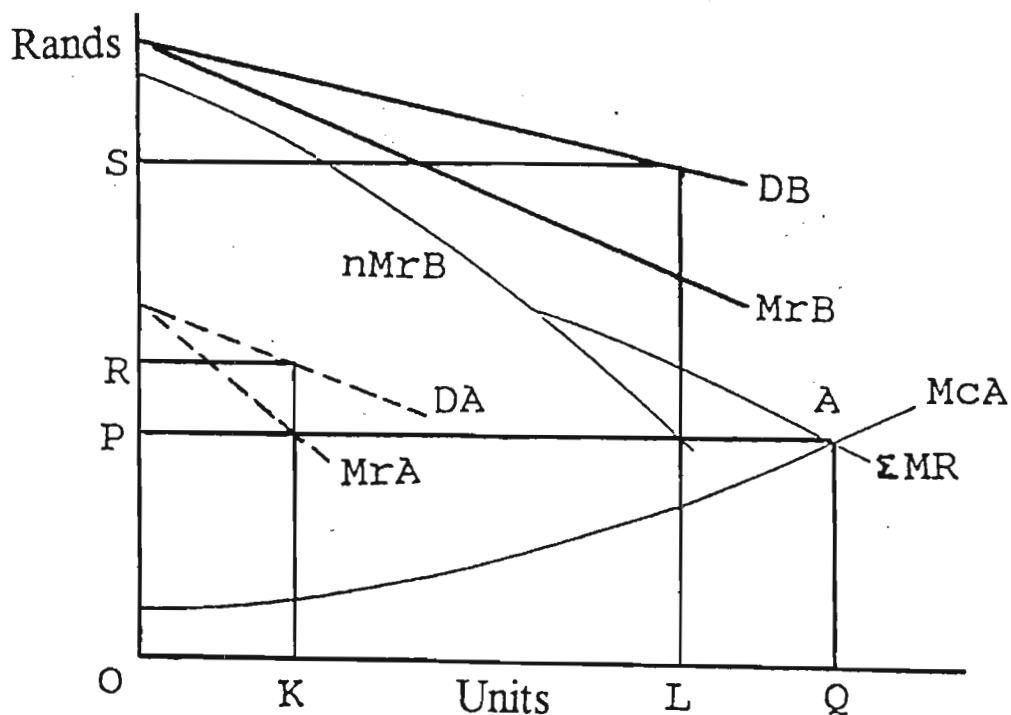


Diagram 2.8

Source: Adapted from Hirshleifer, Jack. 1964. Internal Pricing and Decentralized Decisions. In *Management Controls: New Directions in Basic Research*. Bonini, Jaedicke, and Wagner (editors), New York:Mc Graw Hill, Inc. 33.



### **A critical appraisal of the economic marginal cost (imperfectly competitive intermediate market) transfer pricing method**

Listed below are additional factors to be considered in assessing the appropriateness of the economic marginal cost method:

1. The two-tiered pricing structure that results from the application of this method is in effect dictated to the supplying division as is its output level, in order to prevent it from capitalising on its monopolistic potentialities. This substantially diminishes the autonomy of the supplying division. (Benke & Edwards 1980 35).

2. Although conceptually sound, the marginal cost approach is not amenable to real world applications because of the difficulty in estimating accurate demand and marginal cost functions (Tang 1979 11). The determination of an accurate demand function would require marketing research, which does not always produce reliable results. The determination of marginal product costs could also prove problematical, for eg. the traceability of joint and common costs to individual products is often a problem.

3. In an accounting sense marginal cost refers to the variable cost of producing one additional unit. Economic marginal cost as implied by Hirshleifer here would include recovery of investments in fixed assets and returns to capital. Thus modifications to the accounting system will be necessary if the system is to generate the information necessary for the implementation of the Hirshleifer approach (Abdel-khalik & Lusk 1974 13). This modification would require that the cost of equity be incorporated into the accounting system and that both the costs of debt and equity be allocated to products. This is such a radical departure from conventional accounting practice that a parallel information system will have to be run for transfer pricing purposes. The information processing costs associated with such a system in the form of senior management involvement is likely to be substantial. Abdel-khalik & Lusk (1974 15) warn that it should not be assumed that the benefits of obtaining the additional information necessarily outweigh the costs.

4. The assumption of demand and technological independence is questionable in practice (Abdel-khalik & Lusk 1974 14).
5. There is an incentive under the marginal cost system for divisional management to mis-represent cost data. This will maximise divisional profit but result in overall suboptimisation (Abdel-khalik & Lusk 1974 15).
6. As the model is cost based inefficiencies incurred in the supplying division will be passed on to the buying division. In order to avert this, divisions may seek the implementation of a control procedure to isolate the inefficiency in the supplying division. This external form of control however may impair divisional autonomy (Abdel-khalik & Lusk 1974 15).
7. The model considers two divisions only. Complexities associated with multiple divisions dealing in multiple products are ignored (Abdel-khalik & Lusk 1974 15). Solomons (1965 183) points out however that in the case of a single division manufacturing multiple products the ascertainment of the separate marginal costs of the individual products is not necessarily any more complex than determining marginal cost for a single product, provided that the fixed costs do indeed remain fixed and perfect accuracy is not called for.
8. If the supplying division is able to reduce costs through enhanced productivity, marginal cost pricing will not result in an increase in profit for the supplying division as the receiving division will reap the increased profit due to a lower transfer price. On the other hand if the transfer price remains unadjusted so that the benefit of increased cost efficiencies accrues to the supplying division there is no incentive for the receiving division to change its production mix or expand output to capitalise on the relatively cheaper input prices. Measures could be employed to counter this difficulty but such measures deviate from the theoretical principles of marginal cost pricing (Onsi 1970 537-538).
9. Marginal cost pricing assumes all necessary resources are available to produce the optimal output. This is an unrealistic assumption as profit centres may experience monetary or physical constraints

such as manpower. If these are not dealt with in the system the solution may be impractical (Onsi 1970 538).

It can be concluded from the above points that there are significant limitations to the economic marginal cost transfer pricing method which need to be considered before the method can be applied in practice.

## **2.6 VARIABLE PLUS FIXED COST METHOD**

Vendig (1973) proposes a **two-part** transfer pricing system. The receiving division should be charged a **standard variable cost** per unit transferred plus a **lump sum share of the fixed costs** of the supplying division. Vendig demonstrates the advantage of such a system by comparing it to a singular full-cost transfer pricing system which could result in a lack of goal congruence. Consider the following example.

### **Illustrative Example: Variable plus fixed cost method**

The receiving division currently sells 5 000 000 units of a product at R1.00. Transfer-in costs are 70c a unit (full cost). Additional processing costs are 5c a unit. The division therefore currently reports a profit of  $5\,000\,000 * R(1.00 - 0.70 - 0.05) = R1\,250\,000$ .

A competitor enters the market and begins selling the product at 60c a unit. If the division dropped its price to 60c in order to compete its profit statement would appear as shown in Exhibit 4.

In view of the loss the division would be inclined to discontinue the sale of the product. However from a group perspective, given additional information that the full-cost transfer price represents a fixed element of 30c and a variable element of 40c, it makes sense for the division to continue selling the product since it will make a positive contribution to group profit of  $60c - 40c - 5c = 15c$  a unit (sales, less all variable costs). Since the above performance report of the division does not reflect this fact there is no incentive for the division to take the correct goal congruent decision.

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#### EXHIBIT 4

#### RECEIVING DIVISION PROFIT STATEMENT AT REDUCED SELLING PRICE

		R
Sales	$5\,000\,000 \times .60 =$	3 000 000
Variable costs		
Transfer-in	$5\,000\,000 \times .70 =$	(3 500 000)
Processing	$5\,000\,000 \times .05 =$	( 250 000)
Loss		( 750 000)

---

An obvious remedy to this problem is to base the transfer price on variable cost only. However such a system overemphasises the short term and ignores the reality of the necessity to recover fixed costs in the long run. To remedy this problem Vendig proposes a two-part transfer pricing system. Such a system fosters both a long-term and a short-term perspective to decision making which simultaneously is beneficial to individual divisions and the group as a whole.

In terms of the two-part transfer price the variable cost portion of the transfer price should be based on standard variable cost per unit. The fixed cost portion of the transfer price should be based on that proportion of the capacity costs of the supplying division which are directly traceable to the product. Furthermore the fixed costs should be charged in one lumpsum at the beginning of the reporting period. This adds emphasis to the fact that the fixed cost is a committed cost which must be recovered by a contribution to profit and cannot be varied in the short-term. The profit statement of the receiving division assuming a two-part transfer price and a lump-sum fixed cost transfer of R1 500 000 ( $5\,000\,000 \times 30c$ ) would appear as shown in Exhibit 5.

---

## EXHIBIT 5

### RECEIVING DIVISION PROFIT STATEMENT: TWO-PART TRANSFER PRICE

		R
Sales	$5\,000\,000 \times .60 =$	3 000 000
Variable costs		
Transfer-in	$5\,000\,000 \times .40 =$	(2 000 000)
Processing	$5\,000\,000 \times .05 =$	<u>( 250 000)</u>
Marginal contribution		750 000
Fixed costs		
Lump-sum supplying division transfer		<u>(1 500 000)</u>
Division contribution		<u>( 750 000)</u>

---

The advantage of this profit statement that is afforded by the two-part transfer price is that it considers both short-term (variable cost) and long-term (fixed cost) factors. Thus an evaluation could be made of the division or the group on a short-term or a long-term basis or on both bases simultaneously. For the current reporting period the division should be evaluated on its marginal contribution to group profit of R750 000 which was previously not apparent. Thus, charging fixed costs as a period cost ensures that the receiving division's decision concerning the volume of transfers is not distorted by the conversion of **the supplying division's fixed costs into the variable costs of the receiving division**, as is the case in a singular full-cost transfer pricing system (Solomons 1965 203). However in the long run head office should take cognisance of the fact that a potential saving of R1 500 000 could be made in terms of directly traceable capacity costs if the receiving division

were closed down.

### **A critical appraisal of the variable plus fixed cost transfer pricing method**

#### **a) Promotion of efficiency**

An advantage of the system is that "including variable cost at standard rather than at actual in the transfer price would tend to motivate the manufacturing segments to operate as efficiently as possible in order to produce a favourable variance" (Vendig 1973 35).

Only those variances which are controllable by the supplying division however should be attributed to it. If the buying division is responsible for inefficiencies, for example overtime worked in order to fulfil a rush order, then these costs should be charged to the buying division (Fremgen 1970 27).

Benke & Edwards (1980 26) however maintain that in the latter case this may not be a satisfactory solution as disputes will inevitably arise as to what portion of the variance is truly attributable to the receiving division. For example, the receiving division could conjure up an argument that overtime had to be worked because of inept scheduling on the part of the supplying division. The system therefore does have behavioural implications.

#### **b) Goal Congruence**

As stated above, a short-term and a long-term decision making perspective is accommodated. This promotes goal congruent behaviour.

#### **c) Fair divisional performance evaluation**

The method does not fairly reflect the contribution of the supplying division to group profitability as the supplying division would always break even since transfers are at full cost. In fact from the supplying division's perspective profit centre accounting is an impossibility and the division would have to be evaluated as a cost centre. However circumstances could arise where evaluation of the supplying division as a cost-centre could also prove problematical. An example of this would be where the buying divisions use the supplying division as a type of centralised warehouse and draw

minimum quantities of inventory at regular intervals in order to minimise their own holding costs. In such a case evaluation of the supplying division even as a cost centre may prove problematical because its own holding costs would be influenced by the decisions made by other divisions (Fremgen 1970 27).

#### d) Disputes

The identification of traceable fixed costs could prove problematical and disputes could arise. The manager of the receiving division would not want fixed costs that are not directly traceable to the product to be included in the transfer price. Ultimately the transfer price could end up reflecting the negotiating skills of the divisional managers rather than true costs.

#### e) Changes in planned capacity

In determining capacity costs of the manufacturing division directly attributable to the receiving division Vendig suggests the base should be the planned average operating level at the time the plant was designed. If the current average expected usage is significantly different then divisional management would have to negotiate the appropriate charge level (Vendig 1973 35). Again this renders the system vulnerable to reflecting the negotiating skills of the parties rather than a fair transfer price for capacity costs.

#### f) Cost increases

As stated above, because transfers are at standard price the supplying division is motivated to reduce its costs as much as possible. It would therefore seek to have large production runs to achieve economies of scale. However "there are times when there are very good reasons for costs to be increased in order to take advantage of profit opportunities" (Cook 1955 90). For example, to fill special orders which make a positive contribution to profit. But, if producers tend to be evaluated on cost performance alone, they will resist such special requests which increase their costs, thereby frustrating goal congruence. "This, then, is the basic dilemma of any cost-control system" (Cook 1955 90).

g) Two production lines

It sometimes happens that a company runs two production lines, one with higher costs than the other. The question therefore arises: should the receiving division be charged with the variable and fixed costs of the cheaper or more expensive production line if it does not absorb all the production or should the costs be averaged out? (Cook 1955 91).

h) Cheating

Being a cost-based system it is susceptible to cheating, particularly from the supplying divisions perspective. For example there is incentive to "juggle reports, hide methods improvements, and make simple operations look difficult when a time-study man is watching" so that favourable variances may be reported (Cook 1955 87).

i) Cost classification

It is assumed that all costs can be classified as being either fixed or variable. Breaking down costs into their fixed and variable elements is not a straightforward exercise.

## **2.7 OPPORTUNITY COST METHOD**

Two opportunity cost based methods will be discussed; (1) **variable cost plus opportunity cost** and (2) **marginal opportunity cost**.

### **1. Variable cost plus opportunity cost method**

Onsi (1970) proposes the use of an opportunity cost based transfer pricing system which he maintains addresses some of the deficiencies inherent in economic marginal cost transfer pricing. In particular the system he proposes is able to account for physical and financial constraints that exist at head office and divisional level and which tend to be ignored under economic marginal cost analysis.



Onsi (1970) defines **opportunity cost** as follows:

**Intermediate market exists**

If an external market exists for the intermediate product then the external market price represents the opportunity cost for internal transfer pricing purposes.

**No intermediate market**

If there is no external market for the intermediate product, then the opportunity cost of producing the intermediate product is represented by the contribution that could be derived by producing some other product that has an outside market.

The opportunity cost principle is illustrated by Onsi (1970) using the following illustrative example.

**Illustrative example: Variable cost plus opportunity cost method**

The supplying division produces two products, A & B. **Product A has no outside market** and is transferred to the receiving division. Variable costs of A amount to R3 per unit. **Product B is sold in the outside market** and yields a contribution of R8 per unit. There are two resource constraints; W1 60 units and W2 40 units. Product A utilises 3 units of W1 and 2 units of W2. Product B utilises 6 units of W1 and 4 units of W2. Our objective is to determine a transfer price for Product A.

**Solution**

The decomposition principle is utilised to solve this problem. The underlying mathematical steps applied in arriving at a solution are not discussed here as this is unimportant. It is the output variables of the model in the form of shadow prices which represent the opportunity costs of using scarce resources which are the significant determinants of the transfer price.

The above problem can be expressed in linear programming format as follows:

Objective function : Maximise profit =  $7A + 8B$

subject to:

W1:  $3A + 6B \leq 60$

W2:  $2A + 4B \leq 40$

$A, B \geq 0$

As the price of Product A is unknown, it must be assumed initially that the supplying division will maximise its profits by producing Product B only. Under this assumption the optimal solution is to produce 10 units of B, yielding a contribution of  $10 * R8 = R80$ . Producing 10 units of B will result in both resources being fully utilised and a shadow price of  $W1=8/10$  and  $W2=8/10$ . These shadow prices can now be used to calculate the profit foregone for each unit of A produced.

As Product A uses 3 units of W1 and 2 units of W2 the opportunity cost of using these scarce resources is  $(3 * 8/10) + (2 * 8/10) = R4$ . This means that for each unit of A produced and sold internally the group is foregoing a profit of R4. (The accuracy of the shadow prices can be double checked as follows. B utilises twice as many resources as A. Thus for every unit of A produced  $\frac{1}{2}$  a unit of B is given up. As B yields a contribution of R8 the opportunity cost of producing one unit of A is  $\frac{1}{2} * R8 = R4$ ). The following formula is now applied to calculate the transfer price for each unit of A produced and transferred to the receiving division:

**Transfer price = Variable cost + opportunity cost**

= R3 + R4

= R7

### **A critical appraisal of the variable cost plus opportunity cost transfer pricing method**

#### **a) Goal congruence**

Onsi (1970 539) points out that if **idle capacity** exists, problems may be experienced in motivating

the supplying division to utilise this idle capacity to produce the intermediate product. As the shadow price of idle resources is zero no additional contribution will be earned by the supplying division if it increased its scale of operations. Divisional management will be reluctant to take on additional responsibilities without any rewards.

From the group perspective however it may be desirable for the supplying division to produce the intermediate product as contribution in the receiving division may be positive. Thus the method does not promote goal congruence under these circumstances.

#### b) Operational problems

Onsi (1970 539-542) identifies some operational problems arising from the use of opportunity costs. If the contribution margin of the product that is sold externally by the supplying division is high the resultant high transfer price of the intermediate product may render the product unaffordable to the receiving division. From a group perspective this is not really a problem as the system still generates a plan consistent with group profit maximisation. However the receiving division may be bound by contractual commitments to produce the product. In these circumstances the receiving division should not be allowed to ask the supplying division to subsidise its production by lowering the transfer price as the supplying division should not be penalized by decisions it did not make.

The converse also holds true. If the contribution margin of the alternative product sold by the supplying division is low, the transfer price of the intermediate product will also suffer. Attempts by the supplying division to get the receiving division to subsidise its operation should also be resisted. In the long run, the supplying division will have to introduce new products with higher contribution margins to improve its profitability.

#### c) Shadow prices

Abdel-khalik & Lusk (1974 16) point to the following difficulties with regard to the use of shadow prices in linear programming:

1. Program inputs are centrally determined. This strengthens the case for centralisation to achieve communication efficiencies and the whole concept of decentralised profit

centres may be brought into question.

2. Following on from the above, divisional morale may be negatively affected due to the imposition of shadow price determined transfer prices by head office.

3. If a division deviates from the optimal solution then pre-determined shadow prices as a measure of opportunity cost are rendered inaccurate.

4. The linearity assumption limits the scope of the application of the model in non-linear situations.

## **2. Marginal opportunity cost method**

This transfer pricing method, proposed by Holstrum & Sauls (1973), is based on the premise that it is only beneficial to the group for interdivisional transfers to take place if the opportunity cost of the receiving division is greater than the opportunity cost of the supplying division, where opportunity cost is defined as "the benefit foregone by failing to undertake the next best alternative" (Holstrum & Sauls 1973 29). Consistent with this theory is the proposition that the transfer price should be greater than the opportunity cost of the supplying division (in order to motivate it to supply) and less than the opportunity cost of the receiving division (in order to motivate it to buy). In these circumstances "whenever it is beneficial from a firm-wide view to have a transfer occur, such a transfer is also beneficial to each division. Conversely, whenever the transfer is detrimental from a firm-wide view, it is also detrimental to the performance measurement (profit) of one or both divisions" (Holstrum & Sauls 1973 29). In this way the method ensures goal congruence.

Diagram 2.9 depicts the marginal revenue curve (AB) and the marginal cost curve (CD) of the supplying division. The marginal revenue curve is horizontal as the market for the intermediate product is assumed to be perfectly competitive. Ignoring interdivisional transfers the profit maximising quantity to be produced and sold by the supplying division in the intermediate market is OQ at price OA (the intersection of the marginal revenue and marginal cost curves). Thus for any

# Opportunity cost of supplying division

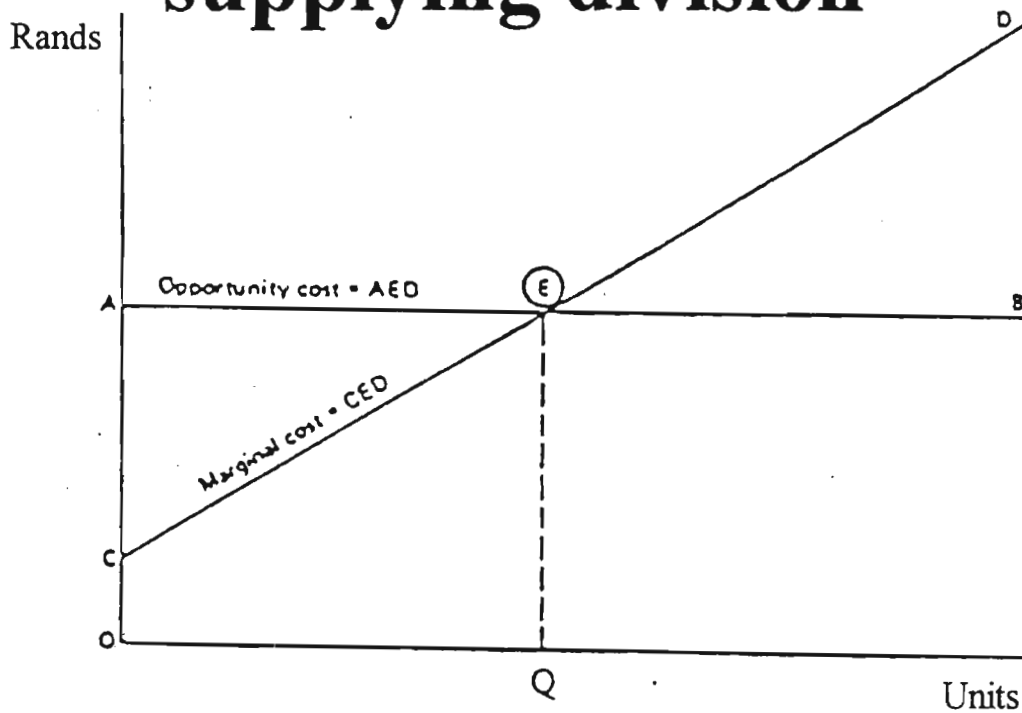


Diagram 2.9

Source: Adapted from Holstrum, Gary L., and E. H. Sauls. 1973. The Opportunity Cost Transfer Price. *Management Accounting* (U.S.A.) 54 (May):29

quantity up to OQ opportunity cost is represented by the line AE.

To motivate the supplying division to expand output beyond OQ the price offered for each incremental unit will have to at least equal marginal cost. Hence opportunity cost for units in excess of OQ is represented by the line ED. The full opportunity costs of the supplying division are therefore represented by the curve AED. Bearing this in mind let us now turn our attention to the cost and revenue curves of the receiving division.

In Diagram 2.10, the horizontal line CD represents the market price prevailing in the intermediate product market. The curve GH represents the net marginal revenue curve of the receiving division (net marginal revenue = marginal revenue derived from the sale of the final product - marginal costs incurred in the receiving division). The receiving division may buy the intermediate product in the intermediate market or from the supplying division. In respect of quantities up to OQ the best alternative to obtaining the intermediate product from the supplying division is to obtain it externally in the intermediate market at price OC. Thus for quantities upto OQ opportunity cost is represented by the line CJ. For quantities in excess of OQ, the maximum price the receiving division would be willing to pay for the intermediate product is limited to net marginal revenue as any price in excess of net marginal revenue will result in a loss on these incremental units. The full opportunity cost of the receiving division across the range of quantities is therefore represented by the curve CJH.

Bearing this in mind let us now turn our attention to Diagram 2.11. The curves AED (Diagram 2.9) and CJH (Diagram 2.10) are superimposed in Diagram 2.11. Reading off the co-ordinates of the point of intersection of the two curves establishes the optimal quantity to be transferred, OQ, and the transfer price OP. A transfer price below OP will result in the supplying division transferring fewer than OQ units as the opportunity cost (marginal cost) of the incremental units will be greater than the revenue derived therefrom. Similarly a transfer price above OP will result in the receiving division demanding a quantity less than OQ as its net revenue on the incremental units will be less than the transfer price. Only a transfer quantity of OQ at price OP will result in profit maximisation for the individual divisions and the group as a whole.

# Opportunity cost of receiving division

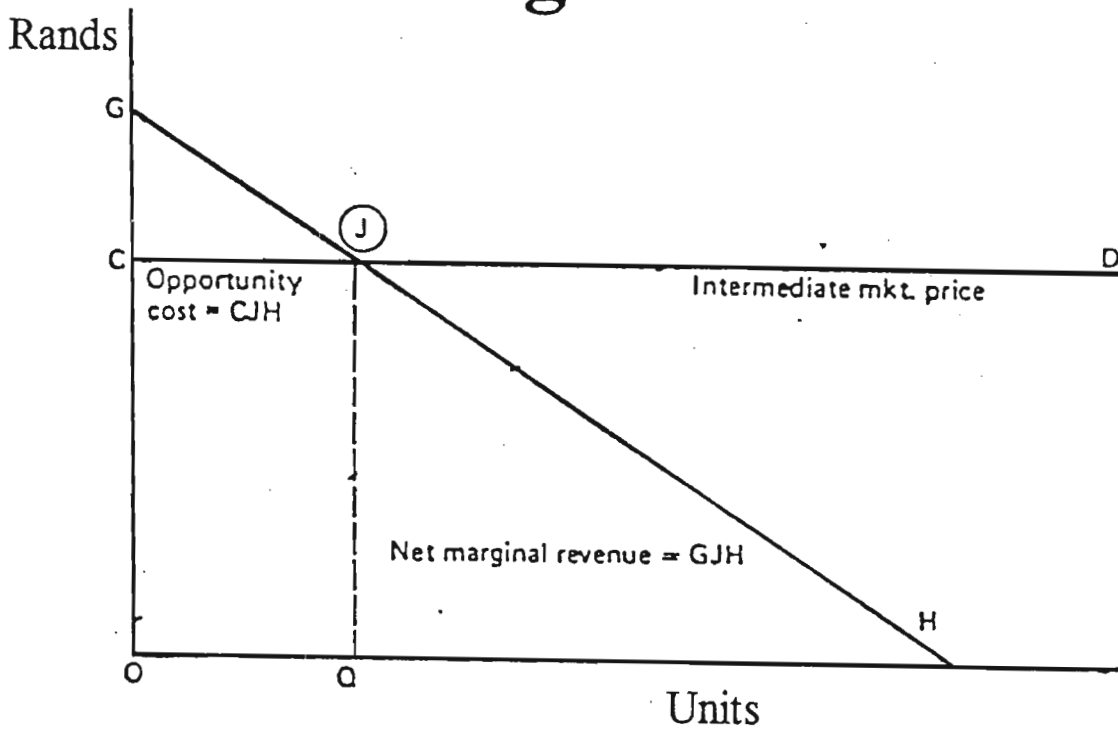


Diagram 2.10

Source: Adapted from Holstrum, Gary L., and E. H. Sauls. 1973. The Opportunity Cost Transfer Price. *Management Accounting* (U.S.A.) 54 (May):30.

# Optimal transfer price

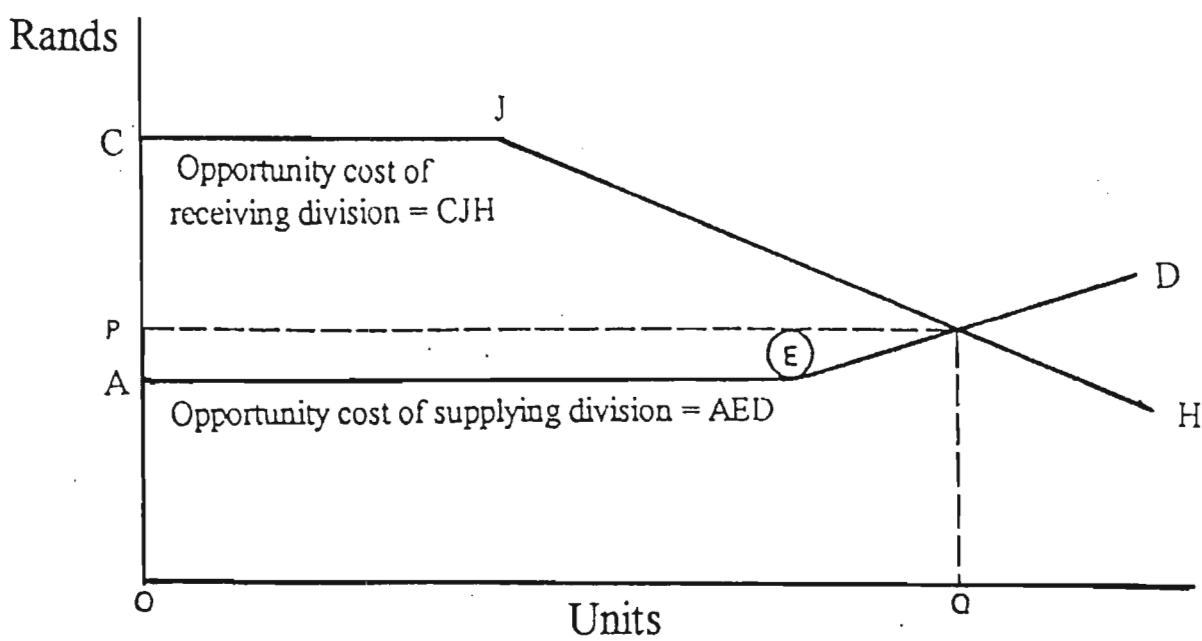


Diagram 2.11

Source: Adapted from Holstrum, Gary L., and E. H. Sauls. 1973. The Opportunity Cost Transfer Price. *Management Accounting* (U.S.A.) 54 (May):31.



## A critical appraisal of the marginal opportunity cost transfer pricing method

### a) Imperfectly competitive intermediate market and goal congruence

Earlier when discussing Hirshleifer's marginal cost transfer pricing system reference was made to the fact that if the buying or selling division is allowed to manifest monopolistic behaviour this would result in an output level which maximises divisional profit but which reduces group profit. The transfer pricing system proposed by Holstrum & Sauls is similarly susceptible to suboptimality. A monopolistic buying division could dictate a transfer price lower than OP whilst a monopolistic selling division could dictate a transfer price higher than OP. In both cases the resulting quantity transferred between the divisions if head office does not intervene would be less than the optimal quantity OQ. This would mean that the increase in either division's profit would be more than offset by the reduction in group profitability. Thus the system will not promote goal congruence in these circumstances. On the other hand if head office were to step in to curb monopolistic behaviour in order to maximise group profit, divisional autonomy would be impaired.

### b) Divisional performance evaluation

The fairness of the system in evaluating divisional performance depends on whether there is a well developed intermediate market for the product or not.

In the case of a **well developed** intermediate market, a transfer pricing system based on marginal opportunity cost will automatically result in an accurate assessment of divisional performance evaluation as the system penalises suboptimal behaviour on the part of the causant. For example, if the manufacturing division fails to produce the optimal quantity only its profits will suffer. The receiving division can simply purchase the intermediate product in the external market to make up the shortfall (Holstrum & Sauls 1973 32).

If there is **no intermediate** market then an accounting system which records interdivisional transfers at the optimal opportunity cost transfer price would result in **unfair** divisional performance evaluation if the quantity transferred is less than optimal (Holstrum & Sauls 1973 32). Consider Diagram 2.12. GH represents the opportunity cost of the supplying division and EF represents the opportunity cost of the receiving division. The optimal opportunity cost based transfer price and quantity is OJ and OQ respectively. At this output level group profit is represented by the triangle ELG. The profit that accrues to the supplying and receiving divisions is represented by the triangles JLG and ELJ respectively.

Assume now that the supplying division, due to its personal circumstances, (for example, a strike), is unable to supply output OQ but instead produces  $OQ_s$  (ie. the single joint level of output for the group as a whole is  $OQ_s$  since there is no intermediate market). Group profit would now be represented by the quadrilateral EKMG implying a reduction in group profit represented by triangle KLM. Of this reduction KNL would be recorded in the books of the receiving division and NML in the books of the supplying division. This is however unfair to the receiving division. The fact of the matter is that the entire reduction in profitability is attributable to the supplying division and it is unfair for the profits of the receiving division to be affected by the unilateral action of the supplying division.

To rectify this deficiency in the performance evaluation system caused by this transfer pricing method Holstrum & Sauls (1973 33) recommend a supplementary journal entry be passed which would effectively credit the receiving division with the loss represented by triangle KNL and debit the supplying division therewith. This modification to the primary transfer pricing system however adds an added dimension of complexity to the system and disputes could arise.

### c) Divisional autonomy

It appears that for the system to function practically the transfer price will have to be centrally determined by head office after the necessary information has been forwarded to it. This implies an impairment of divisional autonomy.

# Less than optimal transfer quantity

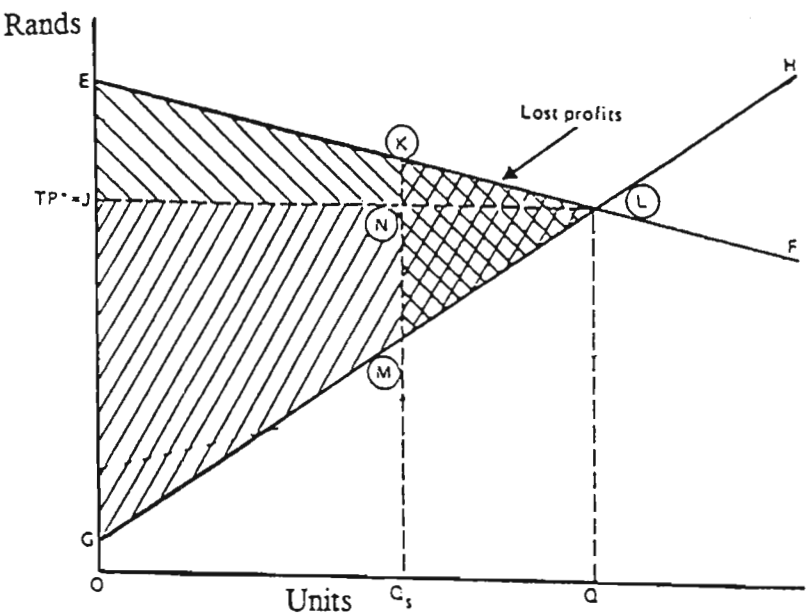


Diagram 2.12

Source: Holstrum, Gary L., and E. H. Sauls. 1973. The Opportunity Cost Transfer Price. *Management Accounting* (U.S.A.) 54 (May):33.

#### d) Cheating

Holstrum & Sauls (1973 33) indicate that for the system to function effectively it should be flexible enough to allow for revisions in the transfer price to take place during the reporting period. Mechanisms should therefore be in place to allow for a division to request a review of the transfer price in response to environmental changes. They acknowledge however that such a system is open to abuse in that a division will tend to report only unfavourable developments and suppress knowledge of favourable developments. This will have to be countered by head office independently gathering information or instituting audits of divisional records. This again detracts from divisional autonomy.

### **2.8 INCREMENTAL COST METHOD**

Goetz (1967) is quite emphatic in his assertion that the **only** relevant goal congruent transfer price is one based on incremental cost. "I contend that both market price and average historical cost, with or without a markup, will be both (1) irrelevant and (2) mischievous in that either will motivate divisional managers to make decisions inimical to the welfare of the company. The unique correct transfer price here, and everywhere in intra-company transfers, is incremental cost" (Goetz 1967 43).

#### **Definition of incremental cost**

Incremental cost is defined as the amount by which total costs will increase (decrease) if activity is increased (reduced). For this purpose activity is defined as a batch of jobs. If three additional jobs are contemplated then the relevant incremental cost is the increase in total cost associated with undertaking all three jobs simultaneously. Based on this definition Goetz proceeds to prove his case based on the following illustrative example.

#### **Illustrative example - Incremental cost method**

Assume a company has four divisions: A,B,C and D. Division D is a computer service bureau which

services the other three divisions. It hires its computer from a manufacturer at a cost of R 4000 per week plus R 50 per hour for hours in excess of 40 per week. Weekly demands on Division D's services are as follows.

Division	Jobs	Hours per job	Total hours
A	15	1	15
B	1	15	15
C	2	6	<u>12</u>
			<u>42</u>

Division D thus incurs a weekly cost of  $R\ 4000 + (2 * R\ 50) = R\ 4100$ . This translates into an average cost per hour of  $R\ 4100/42 = R\ 97.62$ . External computer service companies are assumed to render a similar service at an **external** market price of R 120 per hour.

There are three conceivable transfer prices which can be determined from the above information - incremental cost, market price and actual cost.

**1. Incremental cost transfer price**

The incremental cost transfer price, as defined by Goetz, that will be charged to each division is calculated as follows:

**Division A:** There are two conceivable incremental cost transfer prices. If jobs are not batched the transfer price will be R 50 per job because total company cost will be reduced by R 50 if any one of the 15 jobs is discontinued.

If jobs are batched (between 2 and 15 jobs (inclusive) per batch) the transfer price will be R 100 per batch, irrespective of the number of jobs per batch. This is so because the reduction in total company cost is limited to R100 if a batch constituting 2 or more jobs is eliminated.

**Division B:** The incremental cost attributable to this one job is R 100 because if it is eliminated total company cost is reduced by R100. Division B should thus be charged a transfer price of R 100.

**Division C:** Similarly, if jobs are not batched the transfer price will be R 100 per job. If the jobs are batched (2 jobs per batch) the transfer price will be R100 per batch.

## 2. Market based transfer price

A market based transfer pricing system will result in a transfer price for each division calculated as follows:

Division A:  $R\ 120 * 1\ \text{hour} = R\ 120\ \text{per job}$

Division B:  $R\ 120 * 15\ \text{hours} = R\ 1800\ \text{per job}$

Division C:  $R\ 120 * 6\ \text{hours} = R\ 720\ \text{per job}$

## 3. Transfer price based on actual cost

A transfer price based on actual cost is calculated as follows:

Division A:  $R\ 97.62 * 1\ \text{hour} = R\ 97.62\ \text{per job}$

Division B:  $R\ 97.62 * 15\ \text{hours} = R\ 1464.30\ \text{per job}$

Division C:  $R\ 97.62 * 6\ \text{hours} = R\ 585.72\ \text{per job}$

Assume now that the manager of **Division C** devises some alternative means, costing R 950 externally, of performing the two jobs performed by Division D. If the transfer price is based on **market price** the manager of Division C will be motivated to contract **externally**. He will arrive at his decision as follows:

Cost of purchasing internally	2 * R 720 = R 1440
Alternative external means	R 950
Net advantage of alternative means	R 490

Similarly, if the transfer price is based on **actual cost** the decision will be the same, based on the following analysis:

Cost of purchasing internally	2 * R585.72 = R 1171.44
Alternative external means	R 950.00
Net advantage of alternative means	R 221.44

Both of the above decisions however can be shown to be lacking in goal congruence. From the perspective of the group as a whole the correct decision is not to go for the alternative external means but to contract **internally**. This is reflected in the analysis below:

Cost saving if purchased externally	R 100 (total hours reduced from 42 to 30)
Cost of purchasing externally	R 950
Net cost of external purchase	R 850

If the transfer price had been based on **incremental cost** then the manager of C would have made the correct goal congruent decision, arrived at as follows:

	If jobs are batched	If jobs are not batched
Incremental cost transfer price	R 100	R200
Alternative external means	R 950	R950
Net cost of external purchase	R 850	R750

Thus transfer pricing systems based on incremental cost achieve one of the primary objectives of a sound transfer pricing system, ie. the promotion of goal congruence.

### A critical appraisal of the incremental cost transfer pricing method

#### a) Fair divisional performance evaluation

Attainment of the objective of fair divisional performance evaluation under an incremental cost transfer pricing system is not feasible. As Goetz (1967) puts it:

"... 'profit' centres have no validity, are worse than useless, where-ever (sic) one organisational subdivision does work for another; ... divisional managers cannot be evaluated in terms of 'profits' made by their divisions" (Goetz 1967 437).

The reason why divisional managers should not be evaluated based on profits under an incremental cost transfer pricing system relates to the fact that the system is susceptible to allowing the profits of one division to be influenced by the unilateral actions of another division. Goetz (1967 438) presents the following example to illustrate this point.

#### Example

Based on the original information, let us assume that the manager of **Division C** finds an alternative means of doing one of his jobs that will cost R 40 externally. Based on the following analysis he will decide to contract externally.

Incremental cost transfer price	R100
Alternative external means cost	R 40
Net advantage of purchasing externally	R 60



Contracting outside will result in Division D reducing total computer hours to 36 (42-6). At a total usage level of 36 hours the incremental cost of computer hours is nil. This implies that the transfer price charged to Divisions A and B will be reduced to zero from whatever it was previously and the profitability of the two divisions will rise accordingly. Thus these two divisions will appear to be more profitable purely as a result of factors over which they had no control. Clearly accurate divisional performance evaluation is compromised by the dynamics of an incremental cost transfer pricing system.

#### b) Lack of goal congruence

Edwards & Roemmich (1976 35-36) present an illustration which highlights the weakness of an incremental cost transfer pricing system as far as the attainment of goal congruence is concerned. Let us consider their example.

#### Example

Division A manufactures Product A which it can sell in the intermediate market for R5.00. Incremental costs are R1.75. If the product is not sold in the intermediate market it will be transferred to Division B which will incur additional processing costs of R2.00. Division B will realise R9.00 from the sale of the final product. Capacity in Division B is limited to 100 000 units of the intermediate product. If Division B does not deal in the intermediate product it has the capacity to deal in an alternative good, details of which are as follows:

Raw material cost	R 6.00
Processing costs	R 2.50
Final selling price	R10.00
Capacity limit	150 000 units

#### **No interdivisional transfers**

If the supplying division sold the intermediate product in the external intermediate market and the

receiving division dealt in the alternative good divisional profit statements would appear as shown in Exhibit 6.

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### EXHIBIT 6

#### DIVISIONAL PROFIT STATEMENT - NO INTERDIVISIONAL TRADING

	Division A	Division B	Group
	R	R	R
Sales	500 000 (a)	1 500 000 (b)	
Costs	<u>175 000 (c)</u>	<u>1 275 000 (d)</u>	
Contribution	<u>325 000</u>	<u>225 000</u>	<u>550 000</u>

(a)  $100\,000 \times R\,5$

(b)  $150\,000 \times R10$

(c)  $100\,000 \times R\,1.75$

(d)  $150\,000 \times R\,(6.00 + 2.50)$

---

#### Interdivisional trading

If the divisions traded with each other there are two conceivable transfer prices that could be used - incremental cost and market price. Divisional profit statements based on incremental costs would appear as shown in Exhibit 7. Divisional profit statements based on market price would appear as shown in Exhibit 8.

It follows from comparing Exhibits 6,7 and 8 that the correct decision from a group perspective is for the supplying division to sell its product in the intermediate external market and for the receiving division to deal in the alternative product (ie. no interdivisional trading) as group profit is maximised with this mix of product.

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## EXHIBIT 7

### DIVISIONAL PROFIT STATEMENT - INCREMENTAL COST TRANSFER PRICE

	Supplying Division R	Receiving Division R	Group Total R
Sales	175 000 (a)	900 000 (b)	
Costs	<u>175 000 (c)</u>	<u>375 000 (d)</u>	
Contribution	<u>0</u>	<u>525 000</u>	<u>525 000</u>

(a)  $100\,000 * R1.75$

(b)  $100\,000 * R9.00$

(c)  $100\,000 * R1.75$

(d)  $100\,000 * R(1.75 + 2.00)$

---

If the transfer pricing system were based on **market price** little difficulty would be experienced in persuading the receiving division to make the correct goal congruent decision of processing the alternative product as its profits rise by R25 000 (compare Exhibits 6 and 8). The supplying division is indifferent as to interdivisional trading under a market based transfer pricing system.

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## EXHIBIT 8

### DIVISIONAL PROFIT STATEMENT - MARKET BASED TRANSFER PRICE

	Supplying Division R	Receiving Division R	Group Total R
Sales	500 000 (a)	900 000 (b)	
Costs	<u>175 000 (c)</u>	<u>700 000 (d)</u>	
Contribution	<u>325 000</u>	<u>200 000</u>	<u>525 000</u>

(a)  $100\,000 \times R\,5.00$

(b)  $100\,000 \times R\,9.00$

(c)  $100\,000 \times R\,1.75$

(d)  $100\,000 \times R\,(5.00 + 2.00)$

---

The **incremental cost** transfer pricing system on the other hand has the defect of motivating the receiving division to agitate for the intermediate product to be processed further by it so that it can report a profit of R525 000 instead of R225 000 which would result if no interdivisional trading took place. The supplying division on the other hand will motivate for its product to be sold in the external market so that it can report a profit of R325 000 instead of nil. Naturally to resolve this conflict head office will intervene and instruct the receiving division to manufacture the alternative product. This however impairs divisional autonomy. All these problems will be avoided if a market based transfer pricing system is employed as opposed to an incremental cost transfer pricing system.

## **2.9 COST PLUS AN ALLOWANCE FOR PROFIT METHOD**

Two cost plus models will be discussed. The first model was proposed by Gordon (1970) and is set within the context of a socialist economy. The second model is the three-part transfer pricing model proposed by Vendig (1973) and represents an extension of the two-part transfer pricing model discussed earlier.

### **1. Adaptation of a Socialist economic model**

Gordon (1970) sets forth an elaborate system for the determination of transfer prices in a **decentralised** socialist economy. Although pitched at a macro-economic level the relevance of the system devised by Gordon stems from the fact that this "transfer price system may also be used in the administration of a large firm in a capitalist economy" (Gordon 1970 427). Thus government and individual firms in a socialist economy can be likened to the head office and decentralised divisions of a large firm in a capitalist economy.

The functioning of the system proposed by Gordon is based on the following two basic rules:

1. Head office establishes the rules for determining transfer prices.
2. All other decisions (output, purchase, production) are decentralised and are to be made by divisional management bearing the objective of divisional profit maximisation in mind. In order to secure compliance with this objective divisional management is to be given a profit incentive.

### **Rules for determining transfer prices**

The system devised by Gordon calls for the updating of transfer prices on a quarterly basis. The first step in the system entails the determination of a standard transfer price at the standard output level. This is calculated according to the following formula:

$$\text{Standard transfer price} = \text{standard variable cost per unit} + \frac{[\text{standard annual fixed cost} + \text{standard annual profit}]}{\text{standard output for the year}}$$

Gordon classifies variable costs as those costs which vary in relation to output in the short term. He regards fixed costs as consisting of capital costs (depreciation, interest) and payroll costs. Payroll costs are regarded as being fixed since the level of the payroll expense is a top management decision that is incorporated in the budget. Whilst subordinate levels of management may change variable costs with output, payroll costs may not be changed unless top management revises the budget. Between budgetary changes therefore, payroll costs remain fixed regardless of output.

The standard annual profit allowance is determined by **head office** and varies directly in relation with divisional capital employed and payroll costs.

It must be stressed that the actual transfer price applicable to a quarter and set at the beginning of that quarter is not the standard transfer price but a variant of it, dependent on the relationship between the projected sales for that quarter and the standard output.

The formula for calculating the actual transfer price for the forthcoming quarter is as follows:

$$\text{Actual transfer price} = \text{standard transfer price} + y [\text{projected sales for the quarter (annualized)} - \text{standard annual output}];$$

where;

y is a factor set by head office and depends on how sensitive head office believes prices should be to fluctuations in sales level.

The effect of the above formula on the actual transfer price is as follows:

1. If projected sales are greater than standard output, the actual transfer price is greater than the standard transfer price.
2. If projected sales are less than standard output, the actual transfer price is less than the standard transfer price.

The application of the actual transfer price formula is subject to the proviso that if the actual transfer price so determined falls below standard variable cost per unit then the actual transfer price should be set at standard variable cost.

### **A critical appraisal of the cost plus an allowance for profit transfer pricing method**

#### **a) Divisional autonomy**

Limited divisional autonomy is permitted. A division determines its own transfer price but under the rules and subject to certain variables set by head office. Given this constraint, divisional managers however are permitted to make their own output, purchase and production decisions in a manner consistent with maximising divisional profit.

Thomas (1980 207) does make the point however that in effect the central office dictates the transfer price since different parties applying the same rule in the same circumstances will arrive at the same transfer price. Therefore divisions are not granted any real autonomy.

#### **b) Cost classification**

It is assumed that all costs can be classified as being either fixed or variable. Breaking down costs into their fixed and variable elements is not a straightforward exercise.

Furthermore, the transfer price will vary according to volume and joint costs eg. head office administration costs will have to be allocated. The allocation of joint costs is necessarily arbitrary (Abdel-khalik and Lusk 1974 21).

#### **c) Fair divisional performance evaluation**

Since head office determines the profit element of the transfer price the system is of little value in evaluating managerial performance (Fremgen 1970 27).

#### **d) Goal congruence**

"Full standard cost plus a return on investment could cause a division to buy an intermediate outside because the price was below the transfer price, even though the incremental cost of production

internally in another division would have been below the outside price. Obviously in such a situation, outside purchase would add more to the company's outlays than production within the company would have done. Such purchases would therefore reduce the company's profit...even though the purchasing division, looked at by itself, might be better off as a result of the outside purchase" (Solomons 1965 182).

#### e) Multiple products

Although Gordon assumes a single product environment, the necessity for practical purposes to apportion fixed costs over several products which may be made by a division increases the complexity of the system and may result in arbitrary allocations (Solomons 1965 183).

#### f) Technological innovation

A cost-plus system may have the effect of deterring a manufacturing division from searching for technological innovation in order to reduce costs because if costs are reduced, then profits based on costs will accordingly be reduced (Abdel-khalik & Lusk 1974 21).

### 2. The Three-Part Transfer Price

Vendig (1973) proposes a three-part transfer pricing system. The first two components of the three-part transfer pricing system are as per the two-part transfer pricing system discussed earlier (see page 32). However to enhance the two-part transfer pricing system Vendig proposes a third charge be included in the transfer price to compensate the supplying division for capital employed in manufacturing the intermediate product. The capital charge will thus be a lump-sum charge similar to the fixed cost charge and is calculated as follows:

$$\text{Capital charge} = \text{Traceable fixed assets} * \text{desired rate of return}$$

The desired rate of return is determined by head office. The framework for the presentation of a divisional profit statement under the three-part transfer pricing system is as shown in Exhibit 9.



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## EXHIBIT 9

### RECEIVING DIVISION PROFIT STATEMENT : THREE-PART TRANSFER PRICE

	R
Sales	x xxx xxx
Variable costs	
Transfer in (variable cost of supplying division)	(x xxx xxx)
Additional processing costs	( xxx xxx)
<b>Marginal contribution</b>	x xxx xxx
Fixed costs	
Lump-sum transfer of supplying division fixed costs	(x xxx xxx)
Receiving division fixed costs	_____(xxx)
<b>Division contribution</b>	x xxx xxx
Capital charge	
Traceable fixed assets of supplying division	( xx xxx)
Receiving division's capital charge	_____(xxx)
<b>Divisional residual income</b>	<u>x xxx xxx</u>

---

"The three-part transfer price thus keeps separate the three distinct parts of a transfer price which can be exceedingly useful in evaluating both long-range and short-range situations" (Vendig 1973 36).

#### A critical appraisal of the three-part transfer pricing method

##### a) Goal congruent decision making

It enhances the two-part transfer price. It improves the quality of information available for long-range decision making as the capital charge is based on traceable fixed assets (Vendig 1973 36).

#### b) Performance evaluation

Including a capital charge makes for better performance evaluation of the receiving division. As opposed to the two-part transfer pricing system it enables the implementation of profit centre accounting with its attendant motivational advantages for the supplying division. However the value of this is limited because the desired rate of return is determined by head office.

#### c) Emphasis on return on investment

It forces management "to think in terms of return on investment, which is what the company is in business for" (Cook 1955 91).

#### d) Vertical integration

A disadvantage of the system is that in a vertically integrated group with many tiers the divisions closest to the final market may find it increasingly difficult to recover their costs due to profit add-ons at each transfer stage. Thus the system may deter divisions from entering into interdivisional transactions even though it may be in the interests of the group for transfers to take place (Cook 1955 92).

### **2.10 MARKET PRICE METHOD**

Two authors, Hirshleifer (1956,1964) and Cook (1955), suggest the use of market values in setting transfer prices. Whilst Hirshleifer proposes his theory under certain specific conditions using economic marginal cost analysis, Cook's theory is developed in a less rigorous form and is of greater general application. Let us consider the circumstances under which Hirshleifer's theory applies firstly.

#### **1. Perfectly competitive intermediate market**

Hirshleifer (1956,1964) suggests that where the supplying division has the option of transferring its product internally or selling it externally in a **perfectly competitive** intermediate market then the appropriate transfer price should be the **market price** prevailing in the intermediate market.

The analysis is however based on the simplifying assumption that a situation of demand and technological independence exists between the two divisions. By **demand independence** is meant that the quantity sold by the supplying division (Division A) in the external intermediate market will not affect the quantity sold by the receiving division (Division B) in its final external market. Conversely the quantity sold by Division B in its final external market does not influence the external demand in the intermediate market. Hence Division A will not hesitate to sell its product externally (in the intermediate market that is) if Division B does not offer at least the external market price and Division B will not hesitate to buy externally if it is able to do so more cheaply. **Technological independence** means that the production cost functions of both divisions are independent of the level of interdivisional trading. The determination of the appropriate transfer price and output level in these circumstances is graphically depicted in Diagram 2.13.

With reference to Diagram 2.13, OP represents the price Division A can obtain by selling its goods externally in a **perfectly competitive** intermediate market. PE represents the marginal revenue curve of Division A and McA the marginal cost curve of Division A. Division A will therefore maximise its profits by selling OQ units. (At this point marginal revenue equals marginal cost of Division A).

McB represents the marginal cost curve of Division B, excluding the cost of the bought-in product. Irrespective of whether the bought-in product is purchased from Division A or externally, B will have to pay a price of OP for the product as the intermediate market is perfectly competitive. The dashed curve  $P + \text{McB}$  represents the overall marginal cost curve of Division B (ie. including the cost (OP) for the transferred-in product).

If Division B is able to sell its final product in a perfectly competitive external market at price OT, MrF represents the marginal revenue curve of Division B. Division B will therefore maximise its own profits by selling OQ units (at this point marginal revenue equals marginal cost of Division B).

But a single output level of OQ for both divisions is consistent with a firm profit maximising level of output too, for at OQ, McC (firm marginal cost) equals MrF (firm marginal revenue).

# Perfectly competitive intermediate market

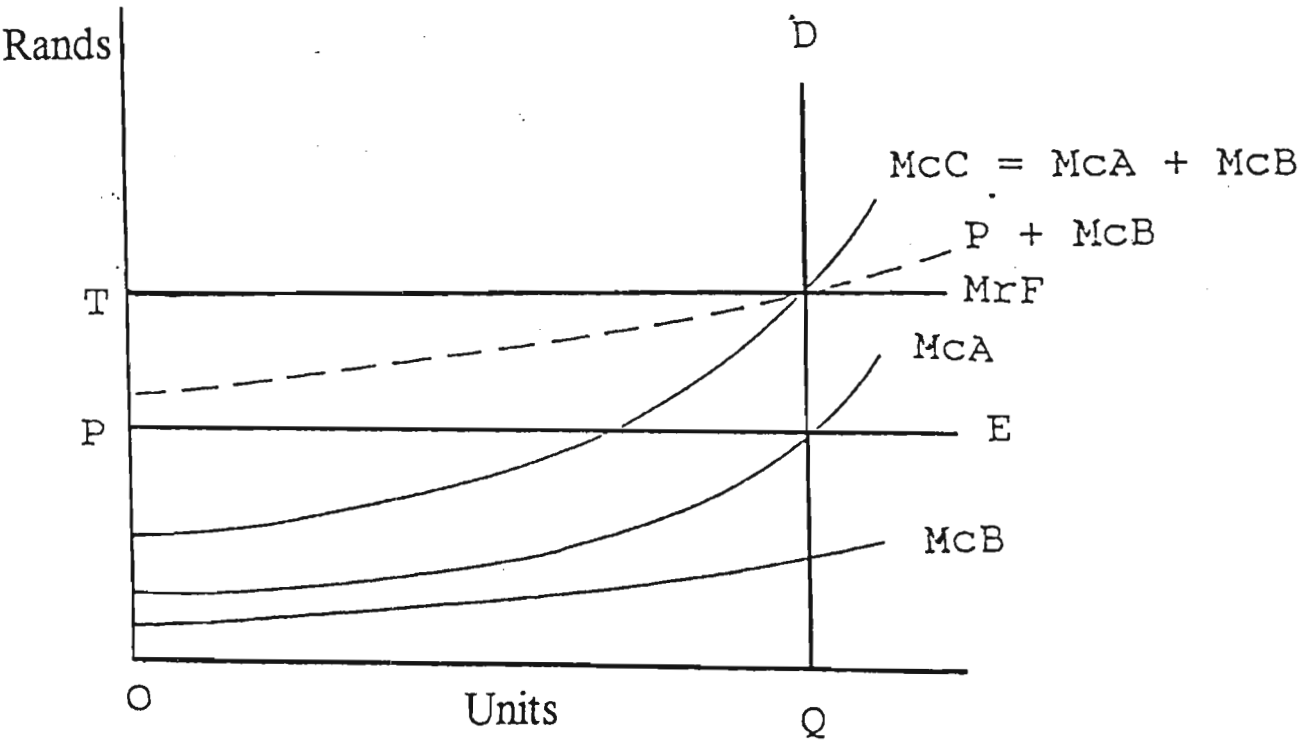


Diagram 2.13

Source: Adapted from Hirshleifer, Jack. 1964. Internal Pricing and Decentralized Decisions. In *Management Controls: New Directions in Basic Research*. Bonini, Jaedicke, and Wagner (editors), New York:Mc Graw Hill, Inc. 31.

This therefore proves that if the intermediate market for Division A's product is perfectly competitive then a transfer price equal to the **market price** in the intermediate market will cause both divisions to act in a manner which will maximise their own and the firm's overall profit level. This does not go to say that both divisions are forced to trade with each other and that a single joint level of output will always apply between the two divisions. All that is being propounded here is that if the divisions are to trade with each other then the transfer price must be set at the market price as this will ensure firm and divisional profit maximisation.

The fact that a single joint level of output will not always apply in these circumstances can be established by reference to Diagram 2.14.

With reference to Diagram 2.14, OP represents the price Division A can obtain by selling its goods externally in a **perfectly competitive** intermediate market. MrA represents the marginal revenue curve of Division A and McA the marginal cost curve of Division A. Division A will therefore maximise its profits by selling OB units. At this point marginal revenue equals marginal cost of Division A.

McB represents the marginal cost of Division B, excluding the cost of the transferred-in product. Irrespective of whether the transferred-in product is purchased from Division A or externally, B will have to pay a price of OP for the product. The dashed curve  $P + \text{McB}$  represents the overall marginal cost curve of Division B (ie. including the cost (OP) of the transferred-in product).

If Division B is able to sell its final product at price OM, MrF represents the marginal revenue curve of Division B. Division B will therefore maximise its own profits by selling OA units (at this point marginal revenue equals marginal cost of Division B). We can see from this that a single joint level of output will not always be required for firm profit maximisation. However if trading is going to take place the transfer price must be set at market price for the transfer price to be goal congruent. Thus if Division B is going to purchase from Division A under the firm profit maximising scenario, the maximum number of units it will purchase is OA at a transfer price of OP. The number of units sold by Division A externally will be the difference between OB and the number taken up by Division B. If Division B takes up all its requirements (OA) from Division A then Division A will sell AB units externally.

# Different divisional output levels

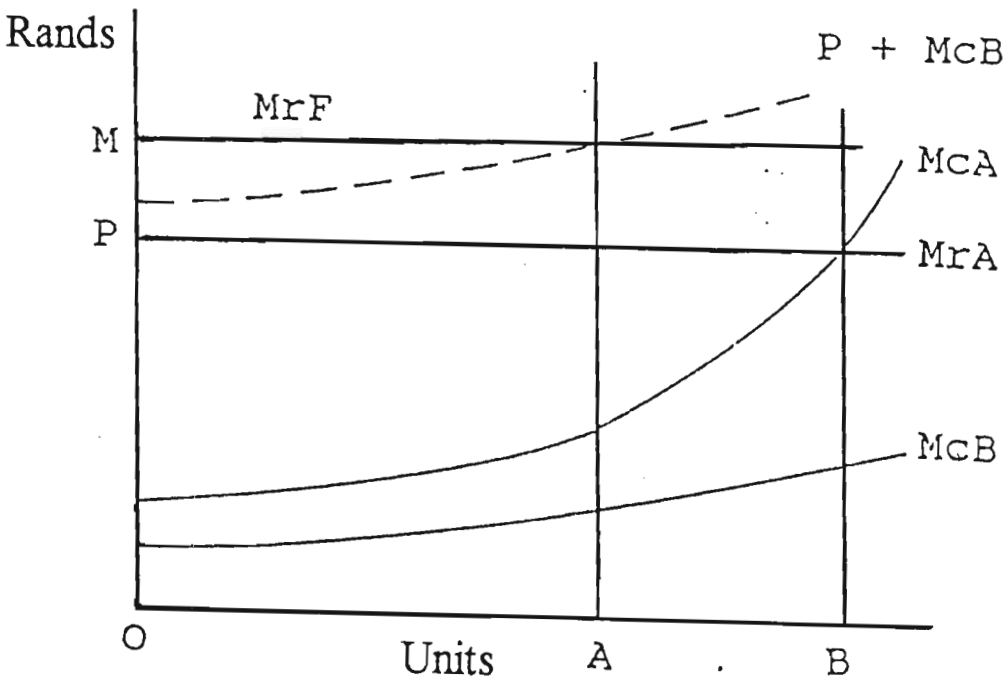


Diagram 2.14

Source: Adapted from Hirshleifer, Jack. 1964. Internal Pricing and Decentralized Decisions. In *Management Controls: New Directions in Basic Research*. Bonini, Jaedicke, and Wagner (editors), New York:Mc Graw Hill, Inc. 31.

### **Imperfectly competitive final market**

The above analysis has assumed that the market for B's final product is **perfectly competitive**; hence the flat marginal revenue curve (MrF). Changing this assumption to one of an **imperfectly competitive** market for the final product of B does not in any way change the analysis. All that would happen is that MrF would be downward sloping instead of flat. The method of output and transfer price determination remains unchanged.

### **General conclusion**

The general conclusion to be drawn from the above analysis is that where the selling division is able to sell its product in an intermediate market characterised by perfect competition, the appropriate transfer price, (irrespective of the market characteristics of the final product) is the **market price** prevailing in the **perfectly competitive intermediate market**.

### **A critical appraisal of Hirshleifer's market price transfer pricing method**

#### **a) Goal congruence**

The method promotes goal congruence as it results in group profit maximisation.

#### **b) Fair divisional performance evaluation**

Divisional performance evaluation is fair because market price is objectively determinable.

#### **c) Divisional autonomy**

Divisional autonomy is enhanced because divisions can be granted the freedom to trade with each other or to trade externally. There is generally no incentive for head office to intervene in this respect since market perfection will ensure that group profit will remain unaffected by the decision to contract internally or externally.

#### d) Practical relevance

Thomas (1980 136) points to the following requirements for market perfection:

1. Market participants should have perfect knowledge of market prices and product characteristics.
2. Prices should be certain and uninfluenced by market participants.
3. Neither of the divisions should incur transportation costs, transfer taxes, bad debt losses, brokerage fees or other transactions costs.

Thomas (1980 136) concludes that these conditions are difficult to satisfy and therefore the incidences of perfect markets are rare. Benke & Edwards (1980 35) however are of the opinion that if the market imperfections are slight then the method could still be used at a small loss of efficiency.

#### e) Changing market prices

If market prices are constantly changing, difficulties may be experienced in setting the budget. Movements in the market price which are inconsistent with budget estimates may result in time-consuming renegotiations and perceptions of unfairness (Emmanuel & Gee 1982).

### **2. A less rigorous approach to market based transfer pricing theory**

Cook (1955) adopts a more intuitive approach in arguing a case for the utilisation of market prices in setting transfer prices and his system is of more general application than Hirshleifer's. The system is based on the following two assumptions:

#### **Assumptions**

1. There is a well developed external market for the intermediate product and divisions are free to purchase and sell internally or externally, depending on where the greatest profit for them lies.



2. In a decentralised system, profitability based performance evaluation systems are expected to motivate divisional management to maximise divisional profit.

### **Conditions precedent**

The existence of the above two assumptions will have the direct consequence of maximising group profit provided precautionary measures are implemented to prevent divisional management from taking action to increase divisional profit at the expense of group profit. This can be achieved by applying the following two conditions:

#### **Condition 1**

If an opportunity exists to increase divisional profit which will increase group profit then transfers **should** take place between divisions.

#### **Condition 2**

If an opportunity exists to increase a division's profits but group profit will thereby be reduced then the divisions should not be **compelled** to engage in transfer activities.

Compliance with these conditions will ensure that the system will not result in transfers taking place which reduce group profitability and will encourage transfers which will increase group profits.

As far as the first condition is concerned there is no real problem even if transfers do not take place between divisions. If the transfer price is based on market price then irrespective of whether the divisions trade with each other or externally, group profit will remain the same (Thomas 1980 135). Whatever the buying division does not buy internally, it can purchase externally at the same market price; whatever the selling division does not sell internally it can sell externally at the same price.

It would appear that Cook's recommendation that transfers **should** take place is allowing for situations where the net prices buyers and sellers get in the external market is affected by transactions costs such as selling and bad debts expenses which would be avoided on internal sales; for he says

"this difference is really a reflection of the gains of integration; if there were no difference between these net prices, there would be no operating advantages to having profit centres in the same company" (Cook 1955 89).

The actual transfer price if external selling expenses are avoided by trading internally would be higher than the net selling price to motivate the selling division to sell internally and lower than the gross market price to motivate the buying division to deal internally. Cook suggests that the exact price within this range should be the subject of negotiation between the two parties.

The application of the second condition is best explained by means of an example. Assume the receiving division calculates that it can increase its profits by selling additional units at a lower price, to be matched by a reduction in input costs. The receiving division may then approach the supplying division with an offer to buy additional units of the intermediate product at a lower price. From the supplying division's perspective, provided incremental revenues are greater than incremental costs and it has spare capacity it will supply the incremental units at a lower price. If both divisions are making a profit and output is expanded it follows that group profit will be increased as a result of the transfers.

Assume however that the incremental costs of the supplying division exceed the price offered by the receiving division. In the **absence of a compulsion** to make the transfer (as the condition holds), the transfer will not take place. Is this the correct goal congruent decision? Cook attempts to explain to the reader that it is because group profit will be reduced if the transfer does take place but fails to do so with any degree of clarity and in fact apologizes to the reader if he finds the argument difficult to follow, saying he can think of no easy way to explain the point. The fact of the matter is that the point is rather a simple one and can be explained quite easily by means of an example.

### Example

Two divisions within a group trade with each other. Transfers are recorded at market price, which is currently R10 per unit for the intermediate product. Additional information can be gleaned by considering the profit statement as shown in Exhibit 10.

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## EXHIBIT 10

### DIVISIONAL PROFIT STATEMENT - TRANSFER AT MARKET PRICE

	Supplying Division R	Receiving Division R	Group Total R
Sales	10	16	
Transfer in	-	10	
Processing costs	<u>6</u>	<u>5</u>	-
Profit	<u>4</u>	<u>1</u>	<u>5</u>

---

An opportunity is presented to the receiving division to sell additional units of the final product at a discounted price of R10 instead of R16. The maximum price it can pay for the intermediate product is therefore R5, calculated as follows.

Final selling price	R10
Processing costs	<u>5</u>
Maximum transfer price	<u>5</u>

In order to record a profit the receiving division will offer a price of slightly less than R5, say R4.80 per unit. Based on this price, the profit statements for the incremental units if the transfers take place would appear as shown in Exhibit 11.

---

## EXHIBIT 11

### DIVISIONAL PROFIT STATEMENT - TRANSFER AT LESS THAN MARKET PRICE

	Supplying Division R	Receiving Division R	Group Total R
Sales	4.80	10.00	
Transfer in	-	4.80	
Processing costs	<u>6.00</u>	<u>5.00</u>	<u>      </u>
(Loss)/Profit	<u>(1.20)</u>	<u>0.20</u>	<u>(1.00)</u>

---

It is clear from the above profit statement that it is in the interests of the group that the transfers do not take place since the group would record a loss of R1.00 per unit on the incremental units. The supplying division for its part would also reject a transfer since it would incur a loss of R1.20 per unit. Thus if the supplying division is not forced to effect the transfer (as the condition holds) its actions would result in group profit maximisation.

Looked at from a group perspective the reason why it is correct for the transfer not to take place centres around the fact that the increase in total revenue (R10.00 per unit) is less than the increase in total costs (R11.00 per unit).

The specified condition results in goal congruency when group profit is reduced as a result of the transfer because the supplying division in effect rejects a transfer if the sales of the receiving division are not sufficient to cover the incremental costs of both divisions and this in effect is also the condition for group profit maximisation (Cook 1955 89).

## **A critical appraisal of Cook's market price transfer pricing method**

### **a) Productivity improvements**

Using market based transfer prices motivates the supplying division to reduce its costs as much as possible and to emphasize innovation and research and development. This will result in improved productivity (Onsi 1970 535).

### **b) Non-existence of a market price**

The system is of very little value in the case of a product with no known market price, eg products made to specification (Fremgen 1970 27-28).

### **c) Goal congruence**

In order to achieve goal congruence market based transfer pricing systems must reliably reflect the prices that can be realised by sellers in the open market. Difficulties are quite commonly experienced in this respect, for example, if the selling division has excess capacity which if released into the open market would cause a collapse in the price structure, then the current market price is an unreliable indicator of market value, and if used could result in incongruous decision making (Cook 1955 89).

### **d) Divisional autonomy**

Blind adherence to market based transfer prices ignores the possibility that both divisions and the group might be better off dealing with each other at a price below market value, for example, where the selling division is working below capacity (Emmanuel & Gee 1982). Thus head office may need to intervene from time to time to review the situation. Such intervention however detracts from the principles of divisional autonomy (Cook 1955 90).

### **e) Opportunity costs**

Opportunity costs of producing a product relative to other products are accounted for in market prices which enhances the usefulness of a market based system (Edwards & Roemmich 1976 35).

**f) Value added**

Market price provides an objective measure of value added by each segment of the firm for the purposes of performance evaluation (Edwards & Roemmich 1976 35).

**g) Divisional performance evaluation**

If the objective of top management is to evaluate the division as an independent company, then market based transfer prices are a highly effective and objective means of achieving this (Fremgen 1970 27).

**h) Internal savings**

There is a tendency for market prices to be reduced by discounts to reflect savings on promotion and selling costs on internal sales. Theoretically this constitutes a departure from the market price basis. Furthermore, if division managers truly have discretion regarding sources of supply and customers it is questionable whether promotion and selling efforts are necessarily reduced on interdivisional sales (Fremgen 1970 28).

**2.11 NEGOTIATED PRICE METHOD**

Fremgen (1970) is of the opinion that the negotiated price method is "the basis for transfer pricing that is most valid for a truly decentralized firm" (Fremgen 1970 28). Under this method the buying and selling divisions negotiate a price with each other on the basis that they are independent firms out to get the best deal for themselves regardless of the consequences of the deal on the opposite party. Such a system can only function if both divisions have the authority to deal internally or externally as they wish. If the divisions cannot deal externally the system becomes a farce. The basic premise underlying a negotiated transfer pricing system is that all prices at a macroeconomic level are the result of a negotiation process, whether tacit or explicit. Just as market forces result in the efficient allocation of resources in the economy so too will negotiated prices result in the efficient allocation of resources within a divisionalised company. In this way goal congruence will be achieved.

### **The effect of negotiation when there is a known market price**

Where a market price exists for the intermediate product and the supplying division is operating under conditions of full capacity, then it is unlikely that it would be willing to accept a transfer price below current market value. The buying division would also realise that it would be a waste of energy on its part to attempt to negotiate a price below market value. Thus there is very little scope for negotiation in these circumstances and if interdivisional transfers took place they would occur at prevailing market value.

If the supplying division is operating below full capacity however, then it would be willing to sell additional units to the receiving division provided that it received a price in excess of marginal cost. Any units sold above marginal cost (and below the price per unit from an alternative source of supply) will result in an increase in divisional and group profit. In these circumstances the buying division would be willing to negotiate as it would fancy its chances of securing a price below current market value and as close to marginal cost as possible. Thus the actual transfer price will lie somewhere between marginal cost and market price and the negotiated settlement would be beneficial to the buying division, the selling division and the group as a whole.

### **The effect of negotiation when there is no known market price**

Where there is no market price for the intermediate product the minimum transfer price will have to be the marginal cost of the supplying division. The extent to which the actual transfer price lies above the minimum will be a function of the negotiating process and there is no reason why this process between the two divisions should be any less efficient than ordinary negotiations between two independent contractors. If later on the buyer or seller experiences difficulties in covering its costs and wishes to re-negotiate then this is an indication of the lack of bargaining skills on the part of the party concerned rather than any inherent deficiency in a negotiated transfer pricing system.

## **A critical appraisal of the negotiated transfer pricing method**

### **a) Pressure on management time**

It has been argued that negotiations are too time-consuming and wasteful of management's resources. However it is unclear as to why they should be considered more time consuming than normal negotiations between two independent contractors (Fremgen 1970 31).

However the fact cannot be ignored that prices under other transfer pricing methods are more readily and objectively determinable.

### **b) Personality conflicts**

Personality conflicts may override the negotiation process. Again it is unclear as to why the transfer pricing system should be afflicted worse than normal external bargaining situations (Fremgen 1970 31). In fact Spicer (1988) suggests that "contrary to the impression given in much of the literature on transfer pricing, conflicts over internal transfers or transfer prices can have a control purpose and are not necessarily dysfunctional. If properly managed, disputes can provide a means whereby corporate managers acquire critical, local information about internal transfers and their alternatives."

### **c) Divisional performance evaluation**

An argument against negotiated prices is that the profits of a division may be reflective of the negotiating skills of the parties rather than their operational skills. However one wonders whether this is necessarily a deficiency since the ability to negotiate with external parties is a characteristic of a good manager. Thus to the extent top management wishes to evaluate the division as an independent company negotiated transfer prices are appropriate (Fremgen 1970 31).

### **d) Applicability**

Negotiated transfer prices are not appropriate for a highly centralised corporation which may have limited interdivisional trading (Fremgen 1970 31).



e) Goal congruence

Edwards & Roemmich (1976 36) present an illustrative example to demonstrate that negotiated prices do not always result in goal congruence. Let us consider their example.

Example

Assume the receiving division markets two products, A & B. Details of the individual products are as follows:

	<u>Product A</u>	<u>Product B</u>
	R	R
Final selling price	12.00	14.50
Supplying division variable costs	(3.25)	(2.75)
Additional processing costs in receiving division	(2.50)	(3.25)
Group contribution margin	<u>6.25</u>	<u>8.50</u>
Machine hours per unit (supplying division)	4 hours	5 hours
Group contribution per machine hour	R1.5625	R 1.70
Demand constraint	30 000 units	26 000 units

Given that machine hours are limited to 200 000 hours the optimal production mix from a group perspective is to manufacture 26 000 units of Product B and 17 500 units of Product A. This will yield a contribution of **R330 375**  $[(26\,000 * R8.50) + (17\,500 * R6.25)]$ .

Assuming the divisions negotiate a transfer price of R8.00 and R10.00 for intermediate Product A and intermediate Product B respectively, per unit profit from the receiving division's perspective is calculated as follows:

	Product A	Product B
	R	R
Final selling price	12.00	14.50
Transfer-in cost	8.00	10.00
Additional processing costs	<u>2.50</u>	<u>3.25</u>
Contribution margin	<u>1.50</u>	<u>1.25</u>

The optimal profit maximising output for the receiving division is 30 000 units of Product A and 16 000 units of Product B. Group profit at this output level will be **R323 500**  $[(30\,000 * R6.25) + (16\,000 * R8.50)]$ . This is R6 875 (R330 375 - R323 500) less than optimal.

The conclusion to be drawn from this example therefore is that a negotiated transfer pricing system could motivate divisional management to take decisions which are not in the interests of the group.

#### f) Divisional autonomy

Generally, a negotiated transfer pricing system will enhance divisional autonomy (Thomas 1977 198). However, when "divisions do not have approximately equal bargaining strengths, negotiated transfer prices open the door to exactly the sorts of exploitation by dominant divisions that necessitate central-office dictation in the simple Hirshleifer situation. Lacking such dictation, only one division will have autonomy, and that will be the unhealthy autonomy of the monopolist or monopsonist " (Thomas 1977 199).

### **2.12 DUAL PRICE METHOD**

Earlier in this chapter it was stated that frequently, conflicts will arise between the attainment of the various objectives of a sound transfer pricing system. Specifically in relation to this, Edwards and Roemmich (1976 35) state that "organisational goal congruence and a fair and equitable basis for performance evaluation are frequently impossible to achieve via a single transfer price." They therefore advocate the use of a dual pricing system (the use of two transfer prices) where there is no

**external market** for the intermediate product. (They acknowledge the merits of a single transfer price based on market values where an external market does exist for the supplying division's product). Under a dual pricing system the supplying division is evaluated on a basis different from the receiving division, whilst not losing sight of the prime objective of overall group profit maximisation.

### **The receiving division**

The intermediate product should be costed out to the receiving division at incremental cost. "Since the receiving centre is then evaluated based upon total selling price minus incremental costs for the entire organization, the receiving centre thus accrues all of the profit from the processing of a good" (Edwards & Roemmich 1976 37). As "this system of transfer pricing results in all of the organisational profits accruing to the last processor of a good. ... this has the highly desirable effect of motivating the receiving centre to act in a manner consistent with organisational goals" (Edwards and Roemmich 1976 37). Thus using incremental cost will cause the receiving division to take decisions which maximise its own profits and concurrently result in group profit maximisation.

### **The supplying division**

The principal difficulty in using an incremental cost transfer pricing system from the supplying division's perspective is that it will not realise a contribution from intracompany sales and, in the absence of external sales, will always report a loss equivalent to its fixed costs. Accurate divisional performance evaluation is therefore not possible and there is no incentive for the supplying division to necessarily take goal congruent decisions. In order to facilitate fair divisional performance evaluation and to motivate the supplying division to take goal congruent decisions Edwards & Roemmich (1976) suggest that the supplying division should be classified as a cost centre and evaluated based on its ability to match actual costs with predetermined standards. "This encourages the supplying centre to produce the inputs required by the receiving centre at the lowest possible costs for a given standard of quality. In this manner the efforts of the supplying centre to maximise its performance rating will be consistent with the maximisation of organisational profit" (Edwards &

Roemmich 1976 37).

Thus from the supplying division's perspective transfer price is effectively set at standard cost as its "profit" for performance evaluation purposes is as follows:

$$\text{Profit} = \text{Standard cost} - \text{actual cost}$$

The dual transfer pricing system that is suggested therefore is the use of an **incremental cost** transfer price from the perspective of the receiving division and **standard cost** as the effective transfer price from the perspective of the supplying division.

Edwards and Roemmich caution however that, though the use of an incremental cost transfer price has the desirable effect of motivating the receiving division to act in a goal congruent manner, efficiencies and inefficiencies of the supplying division are also passed on to the receiving division. For cost control evaluation purposes therefore, they recommend that the receiving division should also be evaluated based on the standard cost of work done in the division itself.

### **A critical appraisal of the dual price transfer pricing method**

#### **a) The accounting information system**

A dual transfer pricing system does not facilitate the preparation of consolidated financial statements. Since the cost of one division does not equal the revenue of another division contra accounts will not be eliminated entirely. Thus two sets of accounts will have to be maintained, one for divisional performance evaluation and the other for external reporting purposes.

#### **b) Promotion of efficiency**

The system enhances the promotion of efficiency. Because the revenue of the supplying division is limited to standard cost the supplying division is encouraged to "operate as efficiently as possible in order to produce a favourable variance" (Vendig 1973 35).

#### **c) Setting of standards**

The setting of standards for the supplying division may prove problematical. "Standard setting involves some guesswork, and standards are easily manipulated" (Benke & Edwards 1980 71).

## **2.13 MATHEMATICAL PROGRAMMING METHODS**

The application of mathematical programming techniques to solving transfer pricing problems arose as a result of the shortcomings of the marginal cost transfer pricing models to deal with multiple division, multiple product, decentralised scenarios (Abdel-khalik and Lusk 1974 15).

Baumol and Fabian (1964) discuss the application of the decomposition procedure in solving decentralisation problems. The objective of this section however is not to delve into the mathematical intricacies underlying the application of this procedure for whilst "it's vital that mathematical programming approaches be developed rigorously...once others have done so, it is equally vital to explore these methods' key properties (and the main issues to which they give rise) without getting tangled in the sorts of detail that have been the besetting sin of much recent literature" (Thomas 1977 167).

### **The procedure in general terms**

The procedure could begin with head office tentatively specifying appropriate transfer prices (Thomas 1977 172). Given these transfer prices, divisions are required to specify production plans with the objective of maximising divisional profits. These production plans are then forwarded to head office. Head office will review the plans for a possible lack of goal congruence and adjust transfer prices accordingly. Divisions will be informed of these new transfer prices and will once again be asked to specify optimal production plans. These plans will again be forwarded to head office where they will once again be reviewed for goal congruence and so the procedure continues. After a number of such iterations divisions will eventually specify a production plan which, subject to head office's last specifications, will maximise divisional profit and simultaneously maximise group profit.

### **A critical appraisal of the mathematical programming transfer pricing methods**

#### **a) Divisional autonomy**

The method appears to be participatory. The fact of the matter however is that divisional autonomy

is merely an illusion for in the final analysis decision making is essentially centralised. "The last phase of the process is usually dictated by central management" (Watson & Baumler 1975 408). In fact decomposing decision making to divisional level on the basis of **head office specifications** appears to be an exercise in futility. Head office might just as well have specified resource allocations at the outset.

#### **b) Cheating**

The system is as susceptible to cheating as the marginal cost system (Abdel-khalik & Lusk 1974 20).

#### **c) Divisional performance evaluation**

Changes in the efficiencies of other divisions (or some other divisional action) including divisions with which one does not trade, has the effect of affecting profits of other divisions (Thomas 1980 182). As explained earlier, this is not conducive to fair divisional performance evaluation.

### **2.14 PURPOSE BASED METHOD**

It is perhaps appropriate to conclude the review and evaluation of different transfer pricing systems by considering a very sober document written by Bierman as far back as 1959. In this article Bierman displays no pretences about solving the transfer pricing dilemma by applying an all inclusive method, but in fact argues that different transfer pricing systems are appropriate to different circumstances. The choice of method is dependent upon the **purpose** to which the accounting information will be applied. In a decentralised setting divisional financial reports are utilised for the following purposes:

- 1) divisional performance evaluation
- 2) decision making
- 3) input to the preparation of external financial statements.

Fulfilling these different purposes calls for the application of different transfer pricing systems.

## **1. Divisional performance evaluation**

Bierman (1959 430-431) suggests a dual transfer pricing system be used if the objective is to evaluate divisional performance. Revenues attributed to the supplying division are to be determined on a different basis from the buying cost of the transferred product to the receiving division.

### **Supplying division**

If divisional financial reports are to be used as a basis for assessing divisional managerial performance then the revenues generated by the selling division from the transferred product should be based on market prices. These prices best reflect the conditions that divisional managers would be faced with if they were operating an independent company and therefore form a sound objective basis for evaluating managerial performance (Bierman 1959 30).

This method is not without its problems however. Bierman identifies the following as being problematical in using market based transfer prices to suit this purpose:

1. The determination of the external market price could become clouded by issues such as special payment terms (Bierman 1959 431).
2. If the selling division saves on selling expenses to what extent should this benefit be shared between the buying and selling divisions? (Bierman 1959 431).
3. The determination of price when there is no external market for the product of the supplying division. In this case the suggestion is that the price should be determined by negotiation (with its attendant problems as previously discussed) or failing that then by head office arbitration (Bierman 1959 431). Naturally the latter course impairs divisional autonomy.

### **Receiving division**

The suggestion by Bierman (1959 431) is that purchases of the intermediate product by the receiving

division should be recorded at the **marginal cost** of the supplying division. This would fulfil, he states, one of the conditions necessary to motivate the selling division to optimise its output. Bierman does not explain this point in any detail and one can perhaps deduce the logic behind this suggestion based on a contrast between perfectly and imperfectly competitive intermediate markets.

If the external market for the intermediate product is **perfectly** competitive then the marginal cost of the supplying division will equal the external market price (for it will not expand output beyond the point of intersection of the marginal revenue and marginal cost curves). This effectively results in a single transfer price for both divisions based on market prices where the intermediate market is perfectly competitive.

If however the external intermediate market is **imperfectly** competitive then market price and marginal cost would not coincide (market price would lie above marginal cost). Presumably Bierman is catering for this circumstance by specifying the use of marginal cost instead of market prices as the general rule. This situation was also considered by Hirshleifer. Whereas Hirshleifer suggested that both buying and supplying divisions should use **marginal cost** Bierman suggests the supplying division use **market price** (presumably to fully reflect the gains it would realise if it were granted the autonomy to capitalise on its monopolistic position in the imperfectly competitive external market) and the buying division should use **marginal cost** otherwise its output would be suboptimal from a group perspective. This has the dual effect of enhancing the autonomy and performance evaluation of the supplying division and preserving organisational goal congruence.

## **2. Decision making purposes**

Differential revenues and differential costs are always relevant for decision making purposes. Thus the transfer pricing system should provide information on the costs added to the product as it is transferred from division to division. For this purpose it would seem that a transfer pricing system based on marginal or incremental cost would be most appropriate (Bierman 1959 431).



### **3. External financial reporting**

In terms of Generally Accepted Accounting Practice inventory should be valued at full manufacturing cost. An absorption costing transfer pricing system should therefore be used for this purpose.

#### **A critical appraisal of the purpose based transfer pricing method**

##### **Practical application**

It is interesting to note that what Bierman is in fact propagating is the concept of different costs for different purposes. Whilst the practicalities of his suggestions made in 1959 would have been questionable then, interesting parallels can now be drawn between his system and the recent popularity of activity based costing systems.

In their book "Relevance Lost - The Rise and Fall of Management Accounting" Johnson & Kaplan (1987) argue that management accounting systems have become subservient to the needs of external reporting. Traditional cost accounting they argue was based on information that was too highly aggregated to be of any use for decision making purposes. They advocate the use of activity based costing which is based on a more detailed analysis of overhead expenses. They explain further that they have no quarrel with the use of traditional cost accounting systems for external reporting purposes and in fact advocate the use of two costing systems, one for internal reporting and one for external reporting purposes. Whilst such a suggestion would have been laughed off half a century ago as being prohibitively expensive to maintain, such an argument no longer holds they state, in view of the dramatic reduction in information processing costs which have occurred in recent years.

A similar argument could be put forth in support of a purpose based method of transfer pricing. Since three different transfer pricing systems are called for by Bierman a division could be called upon to produce three different sets of financial reports, with each set being used for a different purpose.

## **2.15 CONCLUSION**

In this chapter various transfer pricing theories were analysed and evaluated. It is evident that no single transfer pricing method can be classified as being universally applicable to suit all circumstances. This is because too many different types of decisions are likely to be based on a particular chosen method and in too many different circumstances. Each method has its advantages and disadvantages, depending on the circumstances (Thomas 1980 212).

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## CHAPTER 3

### A REVIEW OF RECENT EMPIRICAL STUDIES INTO TRANSFER PRICING PRACTICES

#### 3.1 A SUMMARY OF RECENT EMPIRICAL STUDIES INTO TRANSFER PRICING PRACTICES

In this chapter some recent empirical studies covering domestic transfer pricing practices are discussed. Table 3.1 contains a summary of the studies to be analysed. This analysis will serve as a framework for formulating the empirical research design and methodology strategies for the current study and for identifying issues to be investigated. The latter will be discussed in more detail in chapter 4.

Table 3.1 Summary of recent empirical studies covering domestic transfer pricing practices

<u>Study</u>	<u>Country</u>	<u>Research method</u>
Finnie (1978)	United Kingdom	Questionnaire
Choudhury (1979)	United Kingdom	Questionnaire
Tang (1979)	United States and Japan	Questionnaire
Wu & Sharp (1979)	United States	Questionnaire
Benke & Edwards (1980)	United States	Interview
Borkowski (1988)	United States	Questionnaire
Geboers, et al (1989)	South Africa	Questionnaire
Tang (1993)	United States	Questionnaire

Source: Adapted from Grabski.1985. Transfer pricing in complex organizations in *Readings in Accounting for Managerial Control*. Emmanuel, Otley and Merchant (editors), London: Chapman & Hall; 493-495; and author additions.

**3.2 FINNIE (1978)**

The objective of this study, which was carried out by the Chartered Institute of Management Accountants (UK) (CIMA), was to identify the methods used by companies in establishing their transfer prices. The study was carried out during the period 1976-77 and the questionnaire survey method was used to gather empirical evidence.

Questionnaires were distributed to CIMA branches in the UK and these branches in turn distributed the questionnaires to CIMA members known to have an interest in transfer pricing. Thirty-three responses were received and analysed. Unfortunately, no mention is made of the response rate this represents nor are any statistics provided about the size of the parent population.

**STUDY FINDINGS**

**1. Purpose of transfer pricing systems**

Companies were asked to identify the primary purpose of their transfer pricing systems. Table 3.2 contains a ranking in order of decreasing importance of the identified purposes.

Table 3.2 The primary purpose of the transfer pricing systems used by respondent firms - Finnie (1978)

<u>Purpose</u>	<u>Ranking</u>
Divisional performance measurement and evaluation	1
Encourage profit consciousness	2
Maximise divisional profits	3
Tax minimisation	4

Source: Finnie, J. 1978. Transfer pricing practices. *Management Accounting* (UK) 56 (Dec):495

As evidenced by the high ranking of divisional performance evaluation, it would appear that transfer pricing, as a mechanism for establishing control over divisional management, is considered most important (Finnie 1978 496). The low ranking afforded to tax minimisation is also noteworthy.

2. Disadvantages of transfer pricing systems

Companies were asked to indicate the disadvantages and problems associated with their transfer pricing systems. The most frequently cited problem was the difficulty in achieving goal congruence (divisions emphasising their own profitability at the expense of group profit) followed by lengthy disputes over transfer prices.

3. Procedures for establishing transfer prices

The study classifies the procedures (methods) used for establishing transfer prices into three categories: centrally established prices, standard cost plus mark-up and negotiated prices. The distribution amongst these three categories is summarised in Table 3.3.

Table 3.3 Transfer pricing procedures (methods) used by respondent firms - Finnie (1978)

<u>Method</u>	<u>%</u>
Centrally established price	44
Standard cost plus mark-up	28
Negotiated prices	<u>28</u>
	<u>100</u>

Source: Finnie, J. 1978. Transfer pricing practices. *Management Accounting* (UK) 56 (Dec):495

Unfortunately the study does not provide details about the nature of the centrally determined prices. (They could for example be marginal cost prices or some of the suggested theoretically correct prices discussed in chapter 2). One therefore cannot assess the degree of non-compliance with theory except to conclude that the spread between the three categories indicates



that companies do not perceive there to be a single correct transfer pricing method. To the extent that academicians have been prone to suggesting some of their methods as being **the** most correct, one could conclude that there is a divergence from theory of practice.

A further interesting point revealed by the study is that it would appear there is a strong association between the use of centrally determined prices and the high level of complaints relating to the lack of goal congruence of transfer pricing systems (implying the need for central office intervention). There also appears to be a strong association between the use of negotiated prices and the frequency of complaints relating to the susceptibility of transfer pricing systems to lengthy price disputes. Thus some of the shortcomings of transfer pricing systems which were discussed in chapter 2 are manifested in the findings of this study.

### **3.3 CHOUDHURY (1979)**

The objective of Choudhury's study was to review the findings of a 1971 study into the transfer pricing practices of British corporations. The original study was conducted by Rook on behalf of the British Institute of Management. 293 companies replied to a mail questionnaire survey conducted by Rook and 193 of the respondents indicated that they employed a transfer pricing system.

### **STUDY FINDINGS**

#### **1. Transfer pricing methods used by respondent firms**

The transfer pricing methods used by the respondents is summarised in Table 3.4. It is evident from this table that a variety of transfer pricing methods are used in practice, with the balance tilted in favour of the use of non-cost oriented methods. Although 54% of all the companies used a market based approach more than half of these (60%) found it necessary to make some adjustment to market price in order to account for idle capacity or selling expenses (Choudhury 1979 106). This would tend to suggest that the Hirshleifer (unadjusted ) market price model is of limited practical application.

In an accounting sense, variable cost is the closest approximation to Hirshleifer's concept of economic marginal cost transfer prices (Tang 1979). Only 2 % of companies however utilised

Table 3.4 Transfer pricing methods used by respondent firms - Choudhury (1979)

<u>Pricing methods</u>	
Cost-oriented methods:	46 %
Actual or standard variable cost	2 %
Actual or standard full cost	17 %
Full-production cost (actual or std)+fixed mark-up	20 %
Full-production cost (actual or std)+negotiated mark-up	7 %
Non-cost-oriented methods:	54 %
Market price	22 %
Market price less a fixed %	16 %
Market price less a negotiated %	16 %
Total all methods	100 %

Source: Adapted from Choudhury, N. 1979. Transfer pricing practices: room for debate. *Accountancy* (England) 90 (August): 105.

variable cost transfer prices. Furthermore 17% of companies utilised full cost transfer prices.

None of the suggested theoretically correct transfer pricing methods discussed in chapter 2 come out in support for the use of full cost transfer pricing for management control purposes (other than Vendig's two-part system which separates fixed and variable costs). Unless these divisions were classified as cost centres this would represent a divergence of practice from theory. Unfortunately companies did not provide reasons for the use of full cost so that one cannot draw a conclusion in this respect.

### **3.4 TANG (1979)**

Tang identified the primary objective of his study as being to "identify, measure, and explain the similarities and differences in transfer pricing practices of selected industrial companies in the United States and Japan" (Tang 1979 3). In particular his objective was to compare and contrast the transfer pricing methods, transfer pricing objectives and other transfer pricing policies and procedures used by companies in these two countries.

Another specific objective of Tang's study was to "discover the extent of application of the decomposition method and other mathematical programming approaches among the large corporations in Japan and the United States. These methods have been explored by many writers since the early 1960s. Large corporations would most likely have the facilities to implement these sophisticated techniques" (Tang 1979 4).

Tang used 1976 directory lists of the 1000 largest U.S. and 1121 largest Japanese mining and industrial firms (ranked according to sales value) to identify the population to be tested. For the purposes of the full-scale study, which was carried out during 1977, questionnaires were mailed to 300 U.S. companies and 369 Japanese companies. He achieved a response rate of 51 % among the U.S. firms and 30 % among the Japanese firms.

### **STUDY FINDINGS**

#### **1. The extent of use of transfer prices**

92 % of U.S. companies and 73% of Japanese companies indicated that they used transfer pricing. The main reason why companies did not use transfer pricing was because they considered the

volume of interdivisional transfers to be insignificant.

## 2. Transfer pricing objectives

Companies were asked to indicate the single most important or dominant objective of their transfer pricing systems. Table 3.5 reflects the frequency with which particular objectives were identified as dominant objectives.

Table 3.5 Dominant transfer pricing objectives of U.S. and Japanese companies - Tang (1979)

<u>Objective</u>	<u>U.S.</u>	<u>Japan</u>
Maximise group profit	41 %	42 %
Divisional performance evaluation	42 %	38 %
Other	<u>17 %</u>	<u>20 %</u>
	<u>100%</u>	<u>100%</u>

Source: Tang, Roger Y W. 1979. *Transfer Pricing Practices in the United States and Japan*. New York : Praeger.91.

There is no discernible difference between the popularity of goal congruence and performance evaluation as dominant transfer pricing objectives. The promotion of divisional autonomy was not mentioned by any of the companies. However this could relate to a problem in the framing of the questionnaire since it was not listed as an objective and it would have been left up to the respondents to identify this separately.

## 3. Number of domestic transfer pricing methods used

It is interesting to note that a large proportion of companies (44 % U.S. and 42 % Japanese) actually used more than one transfer pricing method. This is perhaps indicative of the lack of universal applicability of a particular transfer pricing method, as was concluded at the end of chapter two. It could also indicate a divergence of opinion between theoreticians who hold there is a single correct transfer price and transfer pricing practitioners who find it necessary to apply more than one transfer pricing method.

#### 4. Types of domestic transfer pricing methods used

The transfer pricing methods used by the respondent firms for domestic interdivisional transfers is summarised in Table 3.6.

This table reflects a fairly even spread between the use of cost and non-cost-oriented transfer pricing methods, with standard full-production cost and full-production cost plus some allowance for profit being the more frequent cost-oriented transfer pricing methods used. Market price (or some variation thereof) is the most frequently used non-cost-oriented transfer pricing method.

#### 5. Dominant domestic transfer pricing methods used

The statistics in Table 3.6 include companies that used more than one transfer pricing method. Companies that used more than one transfer pricing method were also asked to indicate the dominant or most important method used. The results are summarised in Table 3.7.

The exclusion of supplementary transfer pricing methods from the statistics indicates that U.S. companies consider cost-oriented transfer pricing methods more important than non-cost-oriented methods. No such shift in emphasis is discernible among Japanese firms.

The overall use of marginal cost transfer prices (or their accounting approximations of actual/standard variable cost) is fairly sparse. Not a single U.S. firm used mathematical programming prices whilst only one Japanese firm used a mathematical programming price as a supplementary method (the programming method actually used in this case was far simpler than the decomposition procedure described in chapter two). These findings are particularly disconcerting and led Tang to conclude that "there seems to be a gap between the concepts advocated by many writers and those of practitioners with respect to the use of transfer prices. The concepts of marginal cost and opportunity cost, the decomposition procedure, and other programming methods have been advocated by many authorities in the past. However, the acceptance of these concepts or methods among large industrial firms in the United States and Japan appears to be minimal" (Tang 1979 64).

The high level of usage of full-production cost transfer prices also deserves some comment. None of the classic theories discussed in chapter two support full-cost transfer prices (other than Vendig's two-part system which separates fixed and variable costs). Thus, unless divisions are classified as cost centres the high level of usage of full-cost transfer prices among

Table 3.6 Domestic transfer pricing methods used by respondent firms - Tang (1979)

<u>Pricing methods</u>	U.S.	Japan
Cost-oriented methods:	50 %	46 %
Actual variable production cost	0 %	0 %
Actual full-production cost	9 %	9 %
Standard variable production cost	3 %	1 %
Standard full-production cost	17 %	15 %
Actual variable production cost + lump-sum subsidy	1 %	1 %
Full-production cost (actual or std)+some allowance for profit	19 %	20 %
Other cost-oriented methods	1 %	0 %
Non-cost-oriented methods:	50 %	54 %
Market price	22 %	18 %
Market price less selling expenses	8 %	16 %
Negotiated price	18 %	19 %
Mathematical programming price	0 %	1 %
Other non-cost-oriented methods	2 %	0 %
Total all methods	100 %	100 %

Source: Tang, Roger Y W. 1979. *Transfer Pricing Practices in the United States and Japan*.  
New York: Praeger. 61.

Table 3.7 Dominant transfer pricing methods used by respondent firms - Tang (1979)

<u>Pricing methods</u>	U.S.	Japan
Cost-oriented methods:	56 %	47 %
Actual variable production cost	0 %	0 %
Actual full-production cost	8 %	11 %
Standard variable production cost	2 %	2 %
Standard full-production cost	20 %	18 %
Actual variable production cost + lump-sum subsidy	1 %	1 %
Full-production cost (actual or std)+some allowance for profit	24 %	15 %
Other cost-oriented methods	1 %	0 %
Non-cost-oriented methods:	44 %	53 %
Market price	21 %	16 %
Market price less selling expenses	8 %	23 %
Negotiated price	13 %	14 %
Mathematical programming price	0 %	0 %
Other non-cost-oriented methods	2 %	0 %
Total all methods	100 %	100 %

Source: Tang, Roger Y W. 1979. *Transfer Pricing Practices in the United States and Japan*.  
New York: Praeger. 62.

both U.S. and Japanese companies could represent a divergence of practice from theory.

#### 6. The influence of nationality on the choice of transfer pricing method

Tang conducted statistical tests to establish whether the extent of use of cost-oriented or non-cost-oriented domestic transfer prices among large U.S. and Japanese industrial companies differs according to the nationality of these companies. The results of the statistical tests indicated that there is no significant association between nationality and the choice of transfer pricing method, ie. “the orientation of the domestic transfer prices of Japanese firms is not significantly different from that of the U.S. firms” (Tang 1979 70).

#### 7. The influence of company size on the choice of transfer pricing method

Tang conducted statistical tests to establish whether there is a significant association between company size and the choice of transfer pricing method. The results of the tests are somewhat contradictory. In the case of U.S. companies it was found that there is no significant relationship between size and the type of transfer price used. However in the case of Japanese companies it was found that there is a significant relationship between the size of Japanese firms and the orientation of the transfer price used. The actual conclusion drawn by Tang was that “the larger the size of the Japanese company, the more likely will be the use of a non-cost-oriented domestic transfer price” (Tang 1979 73).

It would thus appear that in the case of Japanese companies the larger the size of the company, the more likely it is to use a non-cost-oriented transfer pricing method whereas in the case of U.S. companies one cannot estimate the likelihood of the transfer pricing orientation on the basis of size.

#### 8. The authority for determining transfer pricing policy

24% of U.S. companies and 35% of Japanese companies allowed the divisional executives complete freedom in determining transfer pricing policies. The balance of the companies had some head office involvement in the determination of their transfer pricing policies. Thus it appears that overall the transfer pricing policy formulation process appears to be more a centralised rather than decentralised function.



#### 9. How policy disagreements were settled

The majority (88%) of Japanese companies settled disagreements by means of negotiation between the divisions themselves without any head office involvement. In the case of U.S. companies however most transfer pricing disputes were settled by head office management.

#### 10. Outside purchasing policies

Most Japanese companies were not allowed to purchase externally goods which are available internally. Most U.S. companies on the other hand were permitted to purchase externally, subject to the approval of head office. Thus it would appear that Japanese companies are more restrictive in their outside purchasing policies.

### **3.5 WU & SHARP (1979)**

The objectives of this study were to ascertain the dominant transfer pricing systems used by companies, the objectives of companies' transfer pricing systems and the dominant arbitration methods used to settle transfer pricing disputes. The population surveyed consisted of the 500 largest U.S. firms as listed in the June 1976 edition of *Fortune*. Sixty-one responses were received, representing 12 % of the population.

## **STUDY FINDINGS**

### **1. Transfer pricing objectives**

Companies were asked to score the importance of possible objectives of their domestic transfer pricing systems. The top seven ranked objectives are summarised in Table 3.8.

The top two ranked objectives comply with the often cited objectives of transfer pricing systems mentioned in the literature and discussed in chapter two. The promotion of divisional autonomy however achieved a relatively low ranking (six and seven). This is contradictory to what would have been expected from a review of the transfer pricing literature, which ranks the promotion of divisional autonomy as one of the top three objectives of a transfer pricing system.

Table 3.8 The rankings of transfer pricing objectives - Wu & Sharp (1979)

<u>Objective</u>	<u>Ranking</u>
Maximize overall profits (ie. achieve goal congruence)	1
Facilitate divisional performance evaluation	2
Comply with governmental restrictions (eg. Cost Accounting Standard Board cost standards)	3
Comply with tax regulations	4
Comply with generally accepted accounting standards	5
Facilitate divisional profit maximisation	6
Promote divisional autonomy	7

Source : Adapted from Wu F.H & D. Sharp. 1979. An empirical study of transfer pricing practice.  
*The International Journal of Accounting Education and Research*. Spring: 80-81.

## 2. Transfer pricing systems

Companies were asked to score the importance of various transfer pricing systems, both when a market price is available and when a market price is not available. The rankings achieved are summarised in Table 3.9 in the order of decreasing importance.

When a market price is available companies tend to use market prices, as evidenced by the high ranking of market prices. This also conforms with the importance accorded to market prices in the accounting literature. This finding is in conflict with the findings of Borkowski (1988) which will be discussed later. When market prices are not available companies prefer the use of a full cost plus profit margin system over and above negotiated prices. These findings may indicate a general desirability to base transfer prices on objective criteria like market prices and full cost. The low rating accorded to linear programming prices attests to the practical rejection of mathematically based transfer pricing models.

Table 3.9 The rankings of transfer pricing systems - Wu & Sharp (1979)

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<u>When a market price is available</u>	<u>When a market price is not available</u>
1. Market price	1. Full cost plus profit margin
2. Negotiated price	2. Negotiated price
3. Full cost plus profit margin	3. Full cost
4. Adjusted market price	4. Variable cost plus profit margin
5. Full cost	5. Marginal costs
6. Marginal cost	6. Variable costs
7. Variable costs plus profit margin	7. Linear programming price
8. Variable costs	
9. Linear programming price	

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Source: Adapted from Wu F.H & D. Sharp. 1979. An empirical study of transfer pricing practice. *The International Journal of Accounting Education and Research*. Spring:80-81.

### 3. Arbitration methods

Companies were asked to rank the importance of various arbitration methods used to settle domestic transfer pricing disputes. It was found that the most prevalent method used to settle disputes was a two-stage arbitration process. In stage one of the process divisional management is left to arrive at a resolution to the problem. If the problem cannot be resolved at a local level, then stage two of the process is invoked. In stage two of the process head office management is called in to resolve the dispute.

### 3.6 BENKE & EDWARDS (1980)

The objectives of the study carried out by Benke & Edwards (1980) were twofold. The first objective was “to examine transfer pricing practices of U.S. corporations (selling domestically and internationally) to determine which transfer pricing techniques are used to establish transfer prices” (Benke & Edwards 1980 1). The second objective was “to suggest a procedure that

organisations can use for determining the transfer pricing technique most appropriate for their circumstances” (Benke & Edwards 1980 1).

The study sample consisted of 19 U.S. companies representing 10 industries. The interview process was used to gather empirical evidence. In selecting the companies to be included in the sample the researchers were directed by the objective of having as many industries as possible represented in the sample and whenever possible, having at least two companies from one industry so as to get more than one view from that industry.

All companies that were approached agreed to take part ie. 100 % response rate. Interviewees were usually corporate controllers and one or two staff members having responsibility for segments.

## STUDY FINDINGS

### 1. The importance of transfer pricing

In order to gauge the importance of transfer pricing the interviewees were asked whether they considered transfer pricing important. All interviewees responded in the affirmative. The majority felt that transfer pricing was **very** important while the remainder felt that transfer pricing was only **fairly** important. The frequently cited reasons for regarding transfer pricing as only fairly important were that interdivisional transfers constituted a small proportion of total sales or that there was general acceptance within the firm of the current techniques in use.

### 2. Transfer pricing methods used

The extent to which various transfer pricing methods were used, either as primary or secondary methods by the companies interviewed is summarised in Table 3.10. It is apparent from this table that the companies covered in this study favoured the non-cost-oriented methods more as their primary method, and the cost-oriented methods were favoured as supplementary methods. This suggests that non-cost-oriented methods were considered more important than cost-oriented methods. Also, those companies that used standard full production cost as a transfer price tended to use the method generally at lower levels in the organisation. At the higher levels companies favoured the use of market based approaches. In fact, the two market based methods were individually the most popular primary methods in use. Again a lack of support for theoretical

Table 3.10 Transfer pricing methods used by participating firms - Benke & Edwards (1980)

<u>Pricing methods</u>	Primary methods	Secondary methods
Cost-oriented methods:	43 %	61 %
Actual variable production cost	0 %	0 %
Actual full-production cost	4 %	0 %
Standard variable production cost	0 %	0 %
Standard full-production cost	13 %	6 %
Actual variable production cost + lump-sum subsidy	0 %	0 %
Full-production cost (actual or std) + some allowance for profit	13 %	22 %
Opportunity cost	0 %	5 %
Marginal cost	0 %	0 %
Variable cost plus markup	13 %	28 %
Non-cost-oriented methods:	57 %	39 %
Market price	18 %	17 %
Market price less selling expenses	26 %	0 %
Negotiated price	13 %	22 %
Mathematical programming price	0 %	0 %
Total all methods	100 %	100 %

Source: Adapted from Benke, Ralph L., Jr and James Don Edwards. 1980. *Transfer Pricing: Techniques and Uses*. New York: National Association of Accountants.30.

concepts such as marginal cost and opportunity cost is evident. Benke & Edwards (1980) attribute the lack of popularity of these methods to the difficulty of applying them in practice.

### 3. The number of transfer pricing methods used

A substantial proportion of the companies interviewed used secondary methods in addition to their primary methods. Again this probably bears testimony to the point raised at the end of chapter two that there is no single universally applicable transfer price. Indeed “almost all of the interviewees could point to weaknesses in their transfer pricing techniques, but many were reluctant to consider a change without good cause. This attitude reflected their awareness that currently no transfer pricing technique fits all situations, and it is often hard to defend one technique against another” (Benke & Edwards 1980 10).

Thus it would appear that the tendency for academics to propose their methods as theoretically correct and able to suit all circumstances is mis-placed.

### **3.7 BORKOWSKI (1988)**

The objective of Borkowski’s study was to identify the “environmental and organizational variables which are significant in making transfer pricing decisions in practice” (Borkowski 1988 44). The questionnaire survey method of research was used to obtain the necessary data for the study. Questionnaires were sent out to 452 U.S. firms considered likely to be using transfer pricing. 215 usable responses were received representing a response rate of 48%. Of the 215 usable responses, 168 firms indicated that they used transfer pricing and 47 did not use transfer pricing.

### **STUDY FINDINGS**

#### 1. Domestic transfer pricing methods used

The domestic transfer pricing methods used by respondent firms are summarised in Table 3.11. This table indicates that overall, companies tended to prefer the use of non-cost oriented transfer pricing methods. The four most popular transfer pricing methods are market price (or some variation thereof) (33 %), negotiated prices (23 %), standard/actual full production cost (21 %)

Table 3.11 Domestic transfer pricing methods used by respondent firms - Borkowski (1988)

<u>Pricing methods</u>	
Cost-oriented methods:	44 %
Actual variable production cost	1 %
Actual full-production cost	7 %
Standard variable production cost	2 %
Standard full-production cost	14 %
Actual variable production cost + lump-sum subsidy	0 %
Full-production cost (actual or std)+some allowance for profit	17 %
Variable cost plus markup	1 %
Other cost-oriented methods	2 %
Non-cost-oriented methods:	56 %
Market price	20 %
Adjusted market price	13 %
Negotiated price	23 %
Mathematical programming price	0 %
Total all methods	100 %

Source: Adapted from Borkowski, S C. 1988. *An investigation into the divergence of theory from practice regarding transfer pricing methods*. Ann Arbor: UMI. 96.

and full production cost plus some allowance for profit (17 %).

## 2. The impact of environmental and organisational variables on the choice of transfer pricing method

Borkowski conducted statistical tests to establish whether there is a relationship between the existence of certain environmental and organisational variables and a firm's choice of transfer pricing method. The environmental and organisational variables tested are summarised in Table 3.12.

## 3. Results of the statistical tests

### A. Environmental variables

Borkowski was unable to detect a meaningful relationship between any of the first three environmental variables listed in Table 3.12 and the transfer pricing method used by a firm. The findings in respect of the existence of a market price are perhaps the most surprising and led Borkowski to conclude that "the existence of a market price does not lead to the conclusion that the market price method will be used, as previous research had indicated. The significance of the variable derives from the fact that 83.3 % of the firms reported that it existed, but no relationships can be determined between its existence and the transfer pricing method chosen. This finding is in conflict with the recommendation of most researchers to use market price when it exists" (Borkowski 1988 129-130). In particular, these findings conflict with those of Wu & Sharp (1979) discussed earlier.

Statistical tests were also conducted to establish whether there is a relationship between the nature of an industry and the transfer pricing methods used within the industry. The results are statistically significant and indicate that firms classified as process industries, for eg. chemicals and food are more likely to use market-based transfer prices whilst metal / mining and manufacturing firms have a tendency to use a full cost based method.



Table 3.12 Environmental and organisational variables tested by Borkowski (1988)

---

<u>A. Environmental Variables</u>	<u>B. Organisational Variables</u>
1. Existence of a market price	1. Company size
2. Variability of the environment	2. Organizational conflict
3. Favourability of the environment	3. Degree of integration/diversification
4. Industry	4. Objectives of transfer pricing system
	5. Management compensation/bonus
	6. Basis of performance evaluation
	7. Firm orientation
	8. Management participation in selecting method
	9. Degree of decentralisation

---

Source: Adapted from Borkowski, S C. 1988. *An investigation into the divergence of theory from practice regarding transfer pricing methods*. Ann Arbor:UMI. 126-141

B. Organisational variables

1. Company size

Borkowski found that small firms are more likely to use a cost-based transfer pricing method, medium sized firms a negotiated method and large firms a market based method.

2. Organizational conflict

There is a significant correlation between firms using a negotiated transfer pricing method and the level of conflict between divisional management, ie. “firms using a negotiated method reported significantly more conflict than firms using other methods” (Borkowski 1988 133). This begs the question however, as to whether the high level of conflict leads to the choice of the negotiated

method or whether the use of the negotiated method causes the conflict. In this respect Borkowski is of the opinion that transfer pricing constitutes a small part of the overall reasons for management interactions and hence cannot be a significant cause of managerial conflict. It is therefore more likely that a high level of organisational conflict leads to the selection of the negotiated price method rather than the other way around.

### 3. Degree of integration/diversification

No significant relationships between this variable and the choice of a transfer pricing method could be discerned.

### 4. Objectives of transfer pricing systems

Borkowski found that companies which emphasise the ease of application of a transfer pricing method as an important objective of a transfer pricing system are more likely to use a full cost based method. Companies which emphasise that a transfer pricing system should facilitate decision making are more likely to use a negotiated method. Finally companies emphasising managerial performance measurement are more likely to use market and negotiated prices.

### 5. Management compensation/bonus

The existence and type of bonus does not appear to have an impact on a firm's choice of transfer pricing method.

### 6. Basis for performance evaluation

No correlation could be found between divisional measures of performance and the choice of transfer pricing method.

### 7. Firm orientation

The business objectives of a firm (long-run profit maximisation, short-run profit maximisation, market share and non-financial interests) does not have any significant impact on a firm's choice of transfer pricing method.

### 8. Manager participation in selecting the method

The level at which a transfer pricing method is chosen (ie. by divisional management, by upper management or jointly by divisional and upper management) correlates significantly with the choice of method. "The more mechanical types of transfer pricing methods (market and full cost) are easily dictated at upper levels, while the more complicated negotiated method requires more decentralized participation by managers in order to be effective" (Borkowski 1988 140).

### 9. Degree of decentralization

The degree of decentralization impacts on a firm's choice of transfer pricing method. Only three out of 167 companies reported a highly centralized environment and all three reported usage of a full cost based transfer pricing method. 39 out of 167 companies reported a highly decentralized environment and the majority (41 %) of these companies used a negotiated method.

## 3.8 GEBOERS, ET AL (1989)

The objective of the Geboers study was to "identify and describe transfer pricing systems in use in selected South African industries and to investigate the management control processes surrounding those systems." (Geboers et al 1989 27).

The researchers identified four sectors on the Johannesburg Stock Exchange which were considered most likely to have internal transfers of goods and services. Companies within these sectors which were considered unlikely to have internal transfers of good and services were eliminated from the population. In total 66 companies were surveyed, 45 of which responded, representing a response rate of 68 %.

## STUDY FINDINGS

### 1. The extent of use of transfer prices

The extent of use of transfer prices amongst survey respondents is summarised in Table 3.13.

Table 3.13 The extent of use of transfer prices among respondent firms - Geboers, et al. (1989)

---

Use transfer prices	19	42 %
Do not use transfer prices	<u>26</u>	<u>58 %</u>
Total	<u>45</u>	<u>100 %</u>

---

Source: Adapted from Geboers, A.A.P.C., et al. 1989. An exploratory survey of transfer pricing in selected South African listed companies. *South African Journal of Business Management* 20 (March):28.

Since only 19 companies used transfer pricing the authors caution that the findings of the study should be considered as being of an exploratory nature only.

2. The relationship between size and the use of transfer prices

In order to gauge whether there is a relationship between size and the use of transfer prices the surveyed companies were stratified on the basis of size, using employee numbers as a surrogate for size. Two strata were identified - companies with employees up to 1000 (small companies) and companies with employees in excess of 1 000 (large companies).

2.1 Companies that use transfer prices

The spread between small and large of the 19 companies that used transfer prices is summarised in Table 3.14. It can be concluded from this that it is predominantly large companies that use transfer pricing. "This is not surprising since a decentralised form of management control is in general more appropriate for a larger company (Geboers, et al. 1989 28).

Table 3.14 Analysis according to size of companies using transfer prices - Geboers, et al. (1989)

---

Small	2	10 %
Large	<u>17</u>	<u>90 %</u>
Total	<u>19</u>	<u>100 %</u>

---

Source: Adapted from Geboers, A.A.P.C., et al. 1989. An exploratory survey of transfer pricing in selected South African listed companies. *South African Journal of Business Management* 20 (March):28

## 2.2 Companies that do not use transfer prices

The spread between small and large of the companies that do not use transfer prices is summarised in Table 3.15.

Table 3.15 Analysis according to size of companies **not** using transfer prices - Geboers, et al. (1989)

---

Small	13	50 %
Large	<u>13</u>	<u>50 %</u>
Total	<u>26</u>	<u>100 %</u>

---

Source: Geboers, A.A.P.C., et al. 1989. An exploratory survey of transfer pricing in selected South African listed companies. *South African Journal of Business Management* 20 (March):28

A high proportion of the companies that do not use transfer pricing are large companies, “despite the fact that the study was carried out among a selected group of companies which were

considered to have a high propensity to decentralize” (Geboers 1989 28). This could possibly indicate “inefficiencies in the management control systems of South African business” (Geboers 1989 28) and a serious divergence from academic theory which is premised on the indispensability of formalised transfer pricing systems in decentralised situations. However, the reasons for the lack of use of transfer pricing among these companies need to be established (for example, there is simply no interdivisional trading) before substantiated conclusions can be drawn in this respect. The reasons why South African companies do not use transfer pricing are explored in the present study and reported in chapter 5.

### 3. The objectives of transfer pricing methods

The respondents were asked to score the applicability of seven possible identified transfer pricing objectives. These results are summarised in Table 3.16.

Table 3.16 The objectives of transfer pricing methods used by respondent firms - Geboers, et al. (1989)

	<u>Ranking</u>
Performance evaluation	1
Goal congruence	2
Divisional autonomy	3
Motivational	4
Aid in management decisions	5
Minimise tax	6
GAAP compliance	7

Source: Geboers, A.A.P.C., et al. 1989. An exploratory survey of transfer pricing in selected South African listed companies. *South African Journal of Business Management* 20 (March):28.

It is interesting to note that no significant divergence between the top three ranked objectives and the objectives of a sound transfer pricing system identified in the literature and discussed in chapter two is evident. However, whereas in chapter two it was pointed out that goal congruence appears to be the prime objective, the results of this study indicate that performance evaluation as an objective is more important than goal congruence.

#### 4. Transfer pricing methods

The respondents were asked to indicate the transfer pricing methods they used under the following two circumstances:

1. A market price is available for the intermediate product
2. A market price is not available for the intermediate product.

##### 4.1 Market price for intermediate product available

The transfer pricing methods used when the market price for an intermediate product is available are summarised in Table 3.17.

Although it is pleasing to note that market price is most frequently used when it is available, one wonders whether the proportion should not be higher as academic theory generally holds that when market prices are available then these should be used. In fact, these figures reflect a divergence from academic theory since 62 % of the companies do not use market prices even when these are available. This correlates with Borkowski's findings discussed earlier.

##### 4.2 Market price for intermediate product not available

The transfer pricing methods used when the market price for an intermediate product is not available are summarised in Table 3.18.

A dominance of negotiated prices in this instance is noted. This conflicts with the findings of Wu & Sharp (1979) who found that U.S. companies rate full cost plus profit margin more highly than negotiated price when a market price is not available.

Table 3.17 Transfer pricing methods used when a market price is available - Geboers et al. (1989)

---

Market price	38 %
Negotiated price	24 %
Cost related	19 %
Cost plus profit	14 %
Other	<u>5 %</u>
Total	<u>100 %</u>

---

Source: Geboers, A.A.P.C., et al. 1989. An exploratory survey of transfer pricing in selected South African listed companies. *South African Journal of Business Management* 20 (March):29

Table 3.18 Transfer pricing methods used when a market price is not available - Geboers et al. (1989)

---

Negotiated price	64 %
Cost related	15 %
Cost plus profit	14 %
Other	<u>7%</u>
Total	<u>100 %</u>

---

Source: Geboers, A.A.P.C., et al. 1989. An exploratory survey of transfer pricing in selected South African listed companies. *South African Journal of Business Management* 20 (March):29



**3.9 TANG (1993)**

This study, which was carried out during 1990, is similar in many respects to the study carried out by Tang (1979). An important objective of this study was to compare the results of this study with the previous study to determine whether there were any discernable changes in the transfer pricing practices of U.S. companies.

Questionnaires were sent to all 500 companies listed in the 1990 edition of the Fortune 500 directory of the largest industrial corporations in the United States. 143 responses were received, representing a response rate of 29 % which is considerably less than the 51 % response rate for U.S. companies in the 1979 study.

**STUDY FINDINGS**

**1. The extent of use of transfer prices**

92 % of all respondents indicated that they used transfer pricing. A similar statistic was reported by Tang (1979). The extent of usage by industry is reported in Table 3.19.

Table 3.19 The use of transfer prices by industry - Tang (1993)

---

Chemicals	77 %
Food	92 %
Forest products	92 %
Metals	90 %
Petroleum refining	100 %
Other industries	93 %

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Source: Tang Roger Y.W. 1993. *Transfer Pricing in the 1990s - Tax and Management Perspectives*. 69. Westport:Quorum Books.

The highest rate of usage of transfer prices appears to be in the petroleum refining industry.

2. Number of domestic transfer pricing methods used

Table 3.20 reflects the number of domestic transfer pricing methods used by the respondent firms, together with comparatives for the previous study.

The proportion of companies using more than one transfer pricing method has marginally increased from 44 % to 48 %. This indicates the lack of progress made over time in resolving the transfer pricing dilemma as far as the development of a single universally applicable transfer pricing method is concerned.

Table 3.20 Number of domestic transfer pricing methods used by companies - Tang (1993)

Number of methods used	1993	1979
One	52 %	56 %
Two	26 %	23 %
Three	15 %	16 %
Four	6 %	3 %
Five	1 %	1 %
Six	-	1 %
	100 %	100 %

Source: Tang Roger Y.W. 1993. *Transfer Pricing in the 1990s - Tax and Management Perspectives*. Westport:Quorum Books. 70; and Tang, Roger Y W. 1979. *Transfer Pricing Practices in the United States and Japan*.New York:Praeger. 63.

### 3. Domestic transfer pricing methods used

The domestic transfer pricing methods used by the respondent firms (together with comparatives for the previous study) are summarised in Table 3.21. Overall these statistics indicate a shift away from cost-oriented to non cost-oriented transfer pricing methods with the greatest gain occurring in the market based transfer price category.

### 4. Company size and the orientation of transfer prices

It will be recalled that Tang (1979) discovered that as far as U.S. companies were concerned there was no significant association between company size and the orientation of the transfer pricing method used whereas in the case of Japanese companies such an association was evident (the larger the size of the Japanese firm the greater the likelihood that it would use non-cost oriented transfer prices). This test was repeated for U.S. companies in the present study and again it was found that there is no significant relationship between company size and the orientation of the transfer pricing method used.

## **3.10 CONCLUSION**

In this chapter some recent empirical studies into transfer pricing practices were reviewed. In some areas study findings corroborate each other whilst in other areas findings are contradictory.

What is certain however is that the economic theories of Hirshleifer and the mathematically complex transfer pricing methods find little support by way of practical application. Full cost based methods on the other hand enjoy considerably more support than academics would be comfortable with. It was this fact which led Borkowski to conclude that "the contradiction of the theoretical literature by actual practices should lead to a reconsideration of the current disapproving attitude toward full cost methods and to the inclusion of full cost methods as a viable transfer pricing method" (Borkowski 1988 151).

Table 3.21 Domestic transfer pricing methods used by the respondent firms - Tang (1993)

<u>Pricing methods</u>	1993	1979
Cost-oriented methods:	46 %	50 %
Actual/std variable production cost	3 %	3 %
Actual full-production cost	9 %	9 %
Standard full-production cost	15 %	17 %
Actual variable production cost + lump-sum subsidy	1 %	1 %
Full-production cost (actual or std)+some allowance for profit	17 %	19 %
Other cost-oriented methods	1 %	1 %
Non-cost-oriented methods:	54 %	50 %
Market price	25 %	22 %
Market price less selling expenses	8 %	8 %
Market price-other	4 %	-
Negotiated price	17 %	18 %
Mathematical programming price	0 %	0 %
Other non-cost-oriented methods	-	2 %
Total all methods	100 %	100 %

Source: Adapted from Tang, Roger Y W. 1979. *Transfer Pricing Practices in the United States and Japan*. New York:Praeger. 61; and Tang Roger Y.W. 1993. *Transfer Pricing in the 1990s - Tax and Management Perspectives*. Westport:Quorum Books.71.

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## **CHAPTER 4**

### **EMPIRICAL RESEARCH DESIGN AND METHODOLOGY**

#### **4.1 OBJECTIVE OF THE EMPIRICAL INVESTIGATION**

The objective of the empirical investigation was to collect data on the domestic transfer pricing practices of large listed South African industrial companies. In particular, data was gathered on (1) the transfer pricing methods used by these companies, (2) the objectives of these companies' transfer pricing systems and (3) other policy issues surrounding transfer pricing; such as the responsibility for choosing the transfer pricing method and the manner of settling disputes.

#### **4.2 RESEARCH DESIGN**

There are various ways of classifying the design of a research study. One way of classifying research design is to consider the case versus statistical study (Cooper & Emory 1995 133). In this regard Cooper & Emory state:

“ The statistical study differs from the case study in several ways. Statistical studies are designed for breadth rather than depth. They attempt to capture a population's characteristics by making inferences from a sample's characteristics. Hypotheses are tested quantitatively. Generalizations about findings are presented based on the representativeness of the sample and the validity of the design.

Case studies place more emphasis on a full contextual analysis of fewer events or conditions and their interrelations. Although hypotheses are often used, the reliance on qualitative data makes support or rejection more difficult” (Cooper & Emory 1995 116).

Based on the above guidelines the case study method of research is rejected for this study. The objective of the study is to obtain comprehensive data from a large number of companies and to identify potential relationships between variables. A statistical study is therefore most

appropriate in the present context.

#### **4.3 DATA COLLECTION TECHNIQUES**

“Every study is a search for information about some topic. We classify information sources into primary and secondary types. Primary data come from the original sources and are collected especially to answer our research question”. (Cooper & Emory 1995 240). Secondary data is obtained from studies carried out by other persons for their own purposes.

Primary source data can be obtained by means of observation or survey. Surveys are more efficient and economical than observation. Surveying facilitates broad geographic coverage “at a fraction of the cost and time required by observation” (Cooper & Emory 1995 269). Information relating to opinions and attitudes can in almost all cases only be gathered by means of questioning. Thus the survey method of gathering data is considered most appropriate for the present study.

Three modes of data collection are available using a survey strategy; personal interviews, telephone interviews and a mail survey. The first two modes of data collection are considered impractical for the purposes of the current study for the following reasons:

1. The objective of the study is to obtain widespread data from a large number of companies.
2. The person that would have to be interviewed should ideally be a person high up in the organisation structure. These persons are normally quite busy and it is difficult to gain access to them.

In support of the use of a mail survey for a study of this nature Tang points to the following advantages:

- “(1) it is simple and easy to administer,
- (2) it is possible to sample a large population, and
- (3) the data can be analyzed using rigorous statistical techniques.” (Tang 1993 60).

The two major weaknesses of a mail survey are nonresponse and limitations on the type and amount of information that can be secured (Cooper & Emory 1995 282-283). The problem of nonresponse was addressed in the present study using established techniques such as follow-ups, non-lengthy questionnaire, use of a covering letter, inclusion of a reply-paid envelope and providing an incentive to respond.

The main secondary data source used for the purposes of the empirical investigation was the June 1996 edition of the Financial Mail Special Survey of Top Companies. The Financial Mail is a widely circulated and authoritative publication in South Africa and there is no reason to doubt the accuracy of the data.

#### **4.4 POPULATION DEFINITION**

The 1996 Financial Mail Special Survey of Top Companies contains a listing of the 286 largest listed South African industrial companies ranked by total assets. As large companies are more likely to use transfer prices than small companies this listing is considered an appropriate basis for establishing the population to be surveyed. Five companies on this list however were from the "Cash Companies" sector of the Johannesburg Stock Exchange and as this sector represents non-trading cash shells these companies were excluded from the population. Two other companies were no longer listed. This then left a final population of 279 companies representing 16 industrial sectors and ranging in size from total assets of R19 148 million for the largest company to R 8 million for the smallest company. The industrial sectors represented in the population are summarised in Table 4.1.

#### **4.5 QUESTIONNAIRE DESIGN**

A copy of the questionnaire together with the covering letter is included in Appendix A. The covering letter was printed on a University of Natal letterhead implying approval of the study by the University. It was felt that the affiliation of a well known university with the study would encourage companies to respond.

The covering letter was addressed to the financial director of the company as he would be in the best position to respond to a questionnaire of this nature since he has overall



Table 4.1 Industrial classification of population

Industrial sector	Number of companies in sector	Percent
1. Industrial holding	43	16%
2. Stores	33	12%
3. Electronics and Electrical	28	10%
4. Food	25	9%
5. Beverages, Hotels and leisure	23	8%
6. Engineering	23	8%
7. Clothing	21	7%
8. Building, Constr. and Allied	18	6%
9. Paper and Packaging	12	5%
10. Pharmaceutical	11	4%
11. Motor	9	3%
12. Printing and Publishing	9	3%
13. Chemicals, oils and plastics	8	3%
14. Transport	8	3%
15. Furniture	5	2%
16. Steel and allied	3	1%
Total	279	100%

Source: Adapted from *Top Companies - Financial Mail Special Survey*. June 28 1996:39-59.

responsibility for the group finance function. If the financial director were to delegate the responsibility for answering the questionnaire to a third person, he is also in the best position to identify the next most responsible person in the organisation competent to answer the questionnaire (Koen 1982 246).

Transfer pricing is often considered a sensitive topic. This problem was addressed by including a statement in the covering letter guaranteeing anonymity to all respondents.

In order to motivate companies to respond the covering letter immediately drew the attention of potential respondents to the fact that the questionnaire would not take long to complete. The inclusion of a reply-paid envelope and the promise of a free copy of a report summarising the results of the study were also mentioned in the covering letter with a view to motivating companies to respond.

The questionnaire was designed in such a way that respondents would have to merely check the appropriate box when answering a question. It was felt that this method of eliciting responses would simplify the answering process and encourage companies to respond. Respondents were however informed that should they wish to provide reasons or explanations with their answers they were most welcome to do so.

A definitions section was included in the questionnaire to improve the accuracy of the answers. The definitions section made it clear to companies that the emphasis of the study was on their domestic transfer pricing practices. The term "goods and services" was also defined for respondents (exclusion of central administrative overheads) as the objective of the study is to concentrate on the core trading activities of companies.

Question one requires respondents to provide an estimate of the level of interdivisional trading. This question is asked with a view to gauging the importance of transfer pricing to a company. Naturally, the greater the level of interdivisional trading the more important transfer pricing is to a company.

Question two requires respondents to indicate whether transfer pricing is used within their group or not. Those respondents answering in the affirmative are routed through the rest of the questionnaire. Companies not using transfer pricing are requested to proceed to the last question, question ten, which requires respondents to provide a reason as to why transfer pricing is not used within their group.

As stated earlier, the objectives of the empirical investigation are threefold. These are to

(1) identify the transfer pricing methods used by companies, (2) identify the objectives of the transfer pricing methods used and (3) to obtain information on certain policy issues relating to transfer pricing. Questions three and four of the questionnaire deal with objective one , questions five and six with objective two and questions seven, eight and nine with objective three.

Transfer pricing methods

Possible transfer pricing methods used by companies were identified from the literature review. These methods are listed in questions three and four. Prior research indicates that a large proportion of companies use more than one transfer pricing method. Thus in question three companies are asked to indicate all transfer pricing methods in use. Question four requires companies which use more than one transfer pricing method to indicate the dominant method in use. In this way the more important transfer pricing methods used in practice were identified.

Transfer pricing objectives

Seven of the more important transfer pricing objectives were identified from the literature review. These objectives are listed in questions five and six. It will be recalled from chapter two that it is often difficult for a transfer pricing system to simultaneously satisfy various objectives. Thus questions five and six attempt to identify the more important transfer pricing objectives. In question five companies are asked to rate the importance of each objective on a five point scale as follows:

	<u>Point value</u>
Extremely important	5
Very important	4
Moderately important	3
Not too important	2
Not at all important	1

In question six companies are asked to identify the single most important or dominant objective of their transfer pricing systems.

### Other policy issues

Based on the review of the literature three important policy issues were identified; viz. (1) the responsibility for the selection of the transfer pricing method, (2) permission to purchase externally goods and services which are available internally and (3) the manner of settling transfer pricing disputes. These issues are dealt with in questions seven, eight and nine respectively.

### Review of the survey instrument

Prior to conducting the pilot test, a draft copy of the questionnaire was discussed with two senior members of the Faculty of Commerce at the University of Natal, Pietermaritzburg.

## **4.6 PILOT TESTING**

“A pilot test is conducted to detect weaknesses in design and instrumentation” (Cooper & Emory 1995 66). In particular a pilot study was conducted in order to detect any ambiguities in the wording of the questionnaire and to establish objective response rates as an aid to determining the appropriate sample size for the full-scale study (Tang 1979 42). Subjects for the pilot study were selected from the population to be tested as it is considered an advantage for the questionnaire to be tested under circumstances approximating those of the final study (Cooper & Emory 1995 319).

“The size of the pilot group may range from 25 to 100 subjects, depending on the method to be tested, but the respondents do not have to be statistically selected ” (Cooper & Emory 1995 66). For the purposes of the present study it was decided to circularise 25 companies using the following rationale.

At least one company from each of the 16 industries represented in the population was included in the pilot study. For this purpose the largest company in each industry was identified and included in the pilot study. The remaining 9 positions were filled by identifying the second largest company in the 9 industries having the highest level of frequency in the population.

Twenty-five pilot questionnaires together with covering letters were mailed to companies on 25 November 1996. A strongly worded follow-up reminder together with a second copy of the questionnaire was mailed on 23 December 1996 to all companies that had not responded to the first mailing. A copy of the reminder letter is included in Appendix B. The results of the pilot

survey are summarised in Table 4.2.

Table 4.2 Responses to the pilot survey

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Number of companies surveyed	25
Number of early responses	7
Early response rate	28 %
Number of responses to second mailing	8
Overall response rate	60 %

---

The overall response rate of 60 % was considered very good and indicated that a full-scale survey was feasible. Respondents did not appear to experience any difficulty in completing the questionnaire. One company however provided a double response to question 9. In order to avoid this in the final survey, question 9 was revised by inclusion of the word “normally”, ie. *“How are transfer pricing disputes between divisions normally settled?”* Other than this change to question 9 no other changes were considered necessary to the final questionnaire.

**4.7 FINAL SURVEY**

For the purposes of the full-scale study it was considered appropriate to survey the remaining 254 companies in the population, ie. a 100 % survey. This was done with a view to obtaining the greatest quantity of information from a broad spectrum of industries.

On 29 January 1997 copies of the final questionnaire together with covering letters were mailed to all the companies included in the final survey. A follow-up reminder along with a second copy of the questionnaire was mailed on 27 February 1997 to all companies that had not responded by this date.

A total of 131 replies were received to the final survey. Of these, 11 questionnaires were returned unanswered either because it was company policy not to participate in surveys or because the respondent considered the questionnaire inapplicable. 3 completed questionnaires

were considered to be unusable due to internal inconsistencies in the answering of the questionnaire. This then left a final tally of 117 usable responses, details of which are summarised in Table 4.3.

Table 4.3 Responses to the final survey

Number of companies surveyed	254
Number of early responses (usable)	76
Early response rate	30 %
Number of responses to second mailing (usable)	41
Overall response rate	46 %

#### **4.8 OVERALL RESPONSE**

Considering the fact that the final survey questionnaire differed only slightly from the pilot survey questionnaire it was considered appropriate to lump together the responses to both surveys for the purposes of data analysis and presentation. The overall usable response rate for both surveys is presented in Table 4.4. An overall usable response rate of 47% compares favourably with the two most recent widespread studies reviewed in chapter 3, namely Tang (1993) and Borkowski (1988), who achieved usable response rates of 29% and 48% respectively.

Table 4.4 Responses to both surveys

	<u>Pilot</u>	<u>Final</u>	<u>Total</u>
Number of companies surveyed	25	254	279
Total usable responses	15	117	132
Overall response rate	60 %	46 %	47 %

#### **4.9 REFERENCES**

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## **CHAPTER 5**

### **EMPIRICAL RESEARCH FINDINGS**

#### **5.1 INTRODUCTION**

In this chapter data obtained by means of the questionnaire survey are analysed and presented. Based on the analysis certain hypotheses are formulated and tested using a statistical technique.

#### **5.2 CHARACTERISTICS OF THE RESPONDENT FIRMS**

##### **Industrial classification**

The distribution of the respondent firms by industrial sector is presented in Table 5.1. The top five sectors represented in the responses are industrial holding, stores, electronics & electrical, food and beverages, hotels & leisure which together comprise 58% of the total responses.

##### **Size classification**

The respondent firms were classified into three size categories based on total asset values as reported in the Financial Mail Survey. The three size categories are: 1. companies with total assets of less than R200 million, 2. companies with assets between R200 million and R1 000 million and 3. companies with assets above R 1 000 million. The distribution of the respondent firms amongst these three categories is presented in Table 5.2.

##### **Interdivisional transfers as a percentage of total sales**

Respondent firms were asked to provide an estimate of the value of domestic interdivisional transfers as a proportion of total group sales. Table 5.3 shows that 44% of companies had interdivisional transfers comprising more than 5 % of total sales.

##### **The extent of use of transfer pricing analysed by industry and in total**

Table 5.4 presents the extent of use of transfer pricing by industry and in total. Overall 73 out of 132 companies use transfer pricing, representing an overall usage rate of 55%. This is



Table 5.1 Industrial classification of the respondent firms

<u>Industrial sector</u>	<u>Number of respondents</u>	<u>Frequency</u>
1. Industrial holding	21	16%
2. Stores	16	12%
3. Electronics & electrical	15	11%
4. Food	13	10%
5. Beverages, hotels & leisure	12	9%
6. Engineering	11	8%
7. Clothing, footwear & textiles	6	4%
8. Building, construction & allied	10	8%
9. Paper & packaging	5	4%
10. Pharmaceutical & medical	4	3%
11. Motor	5	4%
12. Printing & publishing	5	4%
13. Chemicals, oils & plastics	3	2%
14. Transportation	2	2%
15. Furniture, household & allied	1	1%
16. Steel and allied	3	2%
	-----	-----
Total	132	100%
	-----	-----

Table 5.2 Size classification of respondent firms

<u>Total assets (R million)</u>	<u>Number of firms</u>	<u>Frequency</u>
Less than R 200	50	38%
Between R 200 and R 1 000	41	31%
Above R 1 000	41	31%
	----	-----
	132	100%
	----	-----

Table 5.3 Percentage interdivisional transfers

<u>% interdivisional transfers</u>	<u>Number of firms</u>	<u>Frequency</u>
Less than 5 %	70	56%
Between 5 and 10 %	19	15%
Between 10 and 20 %	19	15%
Between 20 and 40 %	10	8%
Above 40 %	8	6%
	----	-----
	126*	100%
	----	-----

\* 6 companies did not disclose the level of interdivisional trading

Table 5.4 The extent of use of transfer pricing analysed by industry and in total

<u>Industrial sector</u>	<u>Number of respondents</u>	<u>Number using transfer pricing</u>	<u>Usage rate</u>
1. Industrial holding	21	11	52%
2. Stores	16	9	56%
3. Electronics & electrical	15	10	67%
4. Food	13	9	69%
5. Beverages, hotels & leisure	12	4	33%
6. Engineering	11	8	73%
7. Clothing, footwear & textiles	6	2	33%
8. Building, construction & allied	10	6	60%
9. Paper & packaging	5	2	40%
10. Pharmaceutical & medical	4	0	0%
11. Motor	5	1	20%
12. Printing & publishing	5	4	80%
13. Chemical, oils & plastics	3	2	67%
14. Transportation	2	1	50%
15. Furniture, household & allied	1	1	100%
16. Steel & allied	3	3	100%
	-----	-----	
Total	132	73	55%
	-----	-----	

considerably less than the 92% usage rate for U.S. companies reported by Tang (1993). The three highest rates of usage by industry are evident in the steel & allied (100%), printing & publishing (80%) and engineering (73%) industries. Rates of usage in total and by industry are graphically represented in Diagrams 5.1 and 5.2 respectively.

#### The extent of use of transfer pricing analysed by company size

Table 5.5 and Diagram 5.3 present the extent of use of transfer pricing by size category. The surprising feature here is the fact that there is a greater frequency of transfer price usage among companies with total assets between R200 million and R1 000 million than the largest companies with assets above R 1 000 million.

#### The extent of use of transfer pricing analysed by the level of interdivisional trading

The extent of use of transfer pricing analysed by the level of interdivisional trading is presented in Table 5.6 and Diagram 5.4. It is not surprising to note that as the level of interdivisional trading rises the frequency of transfer price usage increases.

#### Reasons for not using transfer pricing

Table 5.7 and Diagram 5.5 present the reasons why companies did not use transfer pricing. The most frequently cited reason was a low level of interdivisional transfers. A similar finding was reported by Tang (1993) in respect of U.S. companies. 26% of companies indicated that they did not use transfer pricing because their operations were highly decentralised, divisions were treated as independent operating units and if they traded with each other they would do so at arms length. These groups probably perceive transfer pricing as a form of control mechanism which does not fit in with the decentralised culture of the group.

# Transfer price usage in total

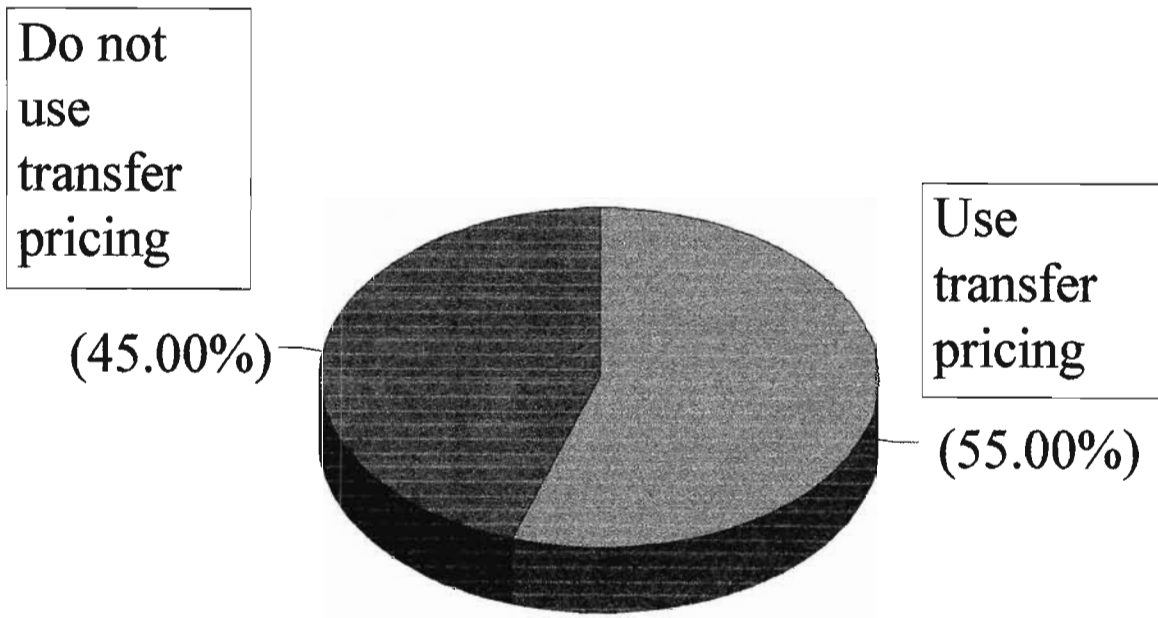


Diagram 5.1

# Transfer price usage by industry

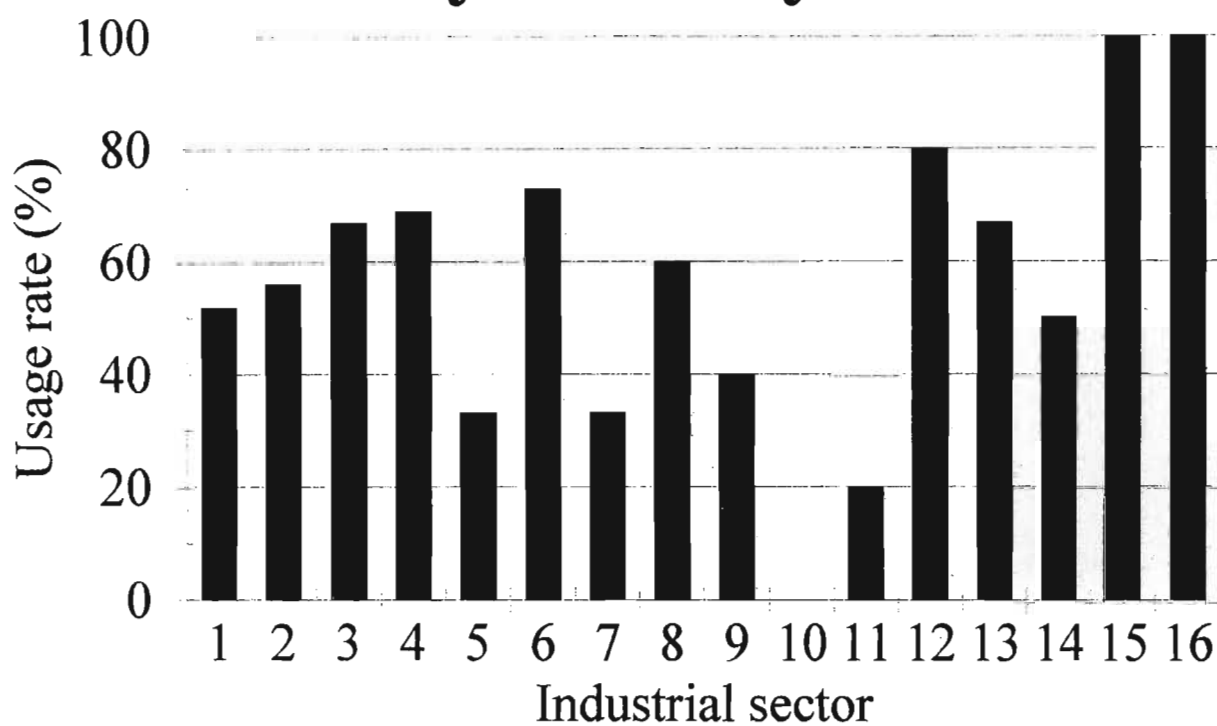


Diagram 5.2

## Key:

- |                                    |                                   |
|------------------------------------|-----------------------------------|
| 1. Industrial holding              | 9. Paper & packaging              |
| 2. Stores                          | 10. Pharmaceutical & medical      |
| 3. Electronics & electrical        | 11. Motor                         |
| 4. Food                            | 12. Printing & publishing         |
| 5. Beverages, hotels & leisure     | 13. Chemicals, oils & plastics    |
| 6. Engineering                     | 14. Transportation                |
| 7. Clothing, footwear & textiles   | 15. Furniture, household & allied |
| 8. Building, construction & allied | 16. Steel and allied              |

Table 5.5 The extent of use of transfer pricing analysed by company size

<u>Total assets (R million)</u>	<u>Number of firms</u>	<u>Number using transfer pricing</u>	<u>Usage rate</u>
Less than R 200	50	24	48%
Between R 200 and R 1 000	41	32	78%
Above R 1 000	41	17	41%
	-----	----	
	132	73	
	-----	----	

Table 5.6 The extent of use of transfer pricing analysed by the level of interdivisional trading

<u>% interdivisional transfers</u>	<u>Number of firms</u>	<u>Number using transfer pricing</u>	<u>Usage rate</u>
Less than 5 %	70	26	37%
Between 5 and 10 %	19	15	79%
Between 10 and 20 %	19	16	84%
Between 20 and 40 %	10	9	90%
Above 40 %	8	7	88%
	-----	----	
	126*	73	
	-----	----	

\* 6 companies did not disclose the level of interdivisional trading

# Transfer price usage by company size

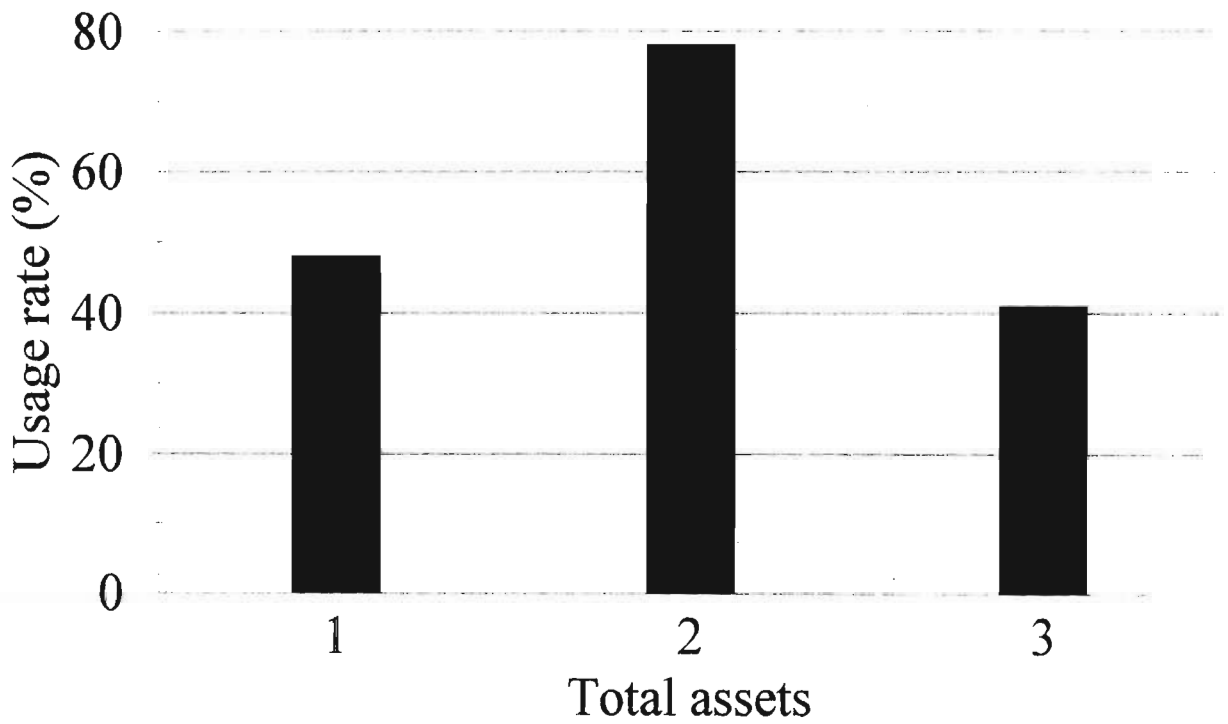


Diagram 5.3

Key:

1. Total assets less than R 200 million
2. Total assets between R 200 and R 1 000 million
3. Total assets above R 1 000 million



## Transfer price usage by level of interdivisional trading

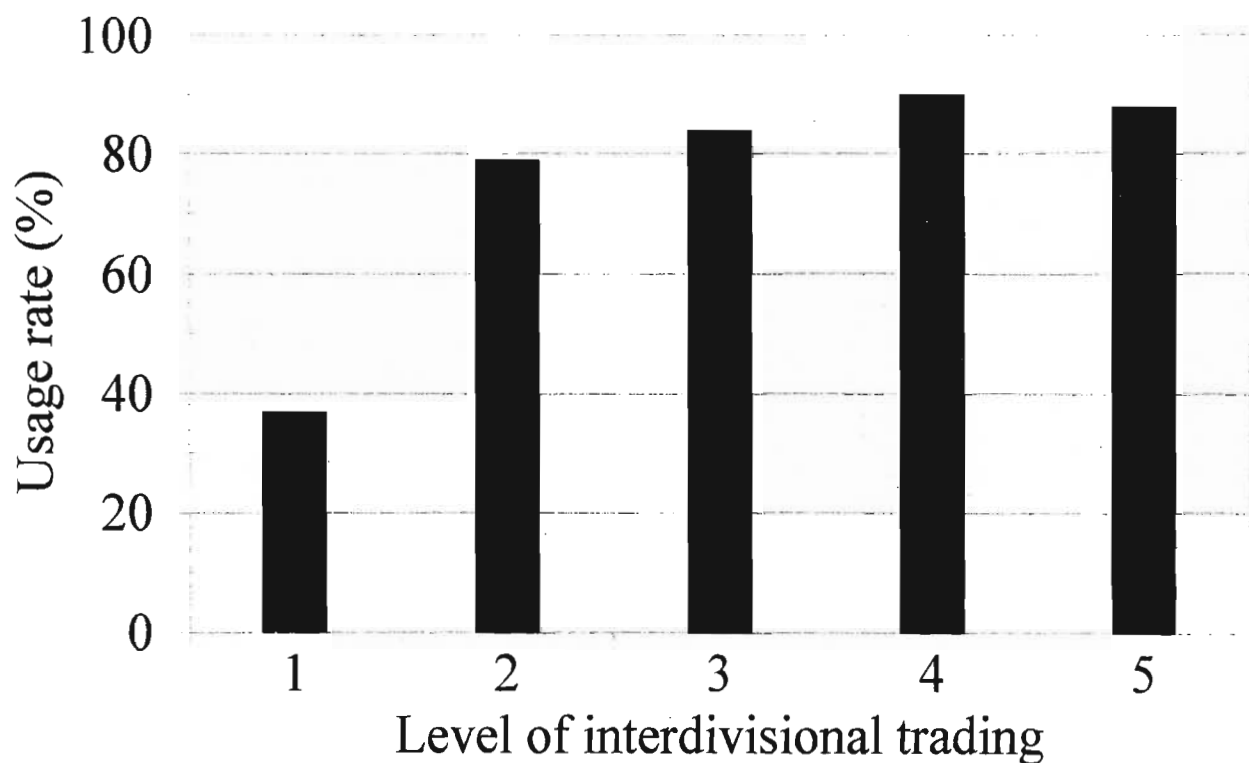


Diagram 5.4

### Key:

1. Less than 5 % of total sales
2. Between 5 and 10 % of total sales
3. Between 10 and 20 % of total sales
4. Between 20 and 40 % of total sales
5. Above 40 % of total sales

Table 5.7 Reasons for not using transfer pricing

<u>Reason</u>	<u>Number of companies</u>	<u>Frequency</u>
1. Volume of domestic interdivisional sales is insignificant	35	62%
2. Operations highly decentralised	15	26%
3. A transfer pricing system is too complicated to operate	4	7%
5. Other	3	5%
	-----	-----
	57*	100%
	-----	-----
* 2 companies did not provide reasons		

## Reasons for not using transfer pricing

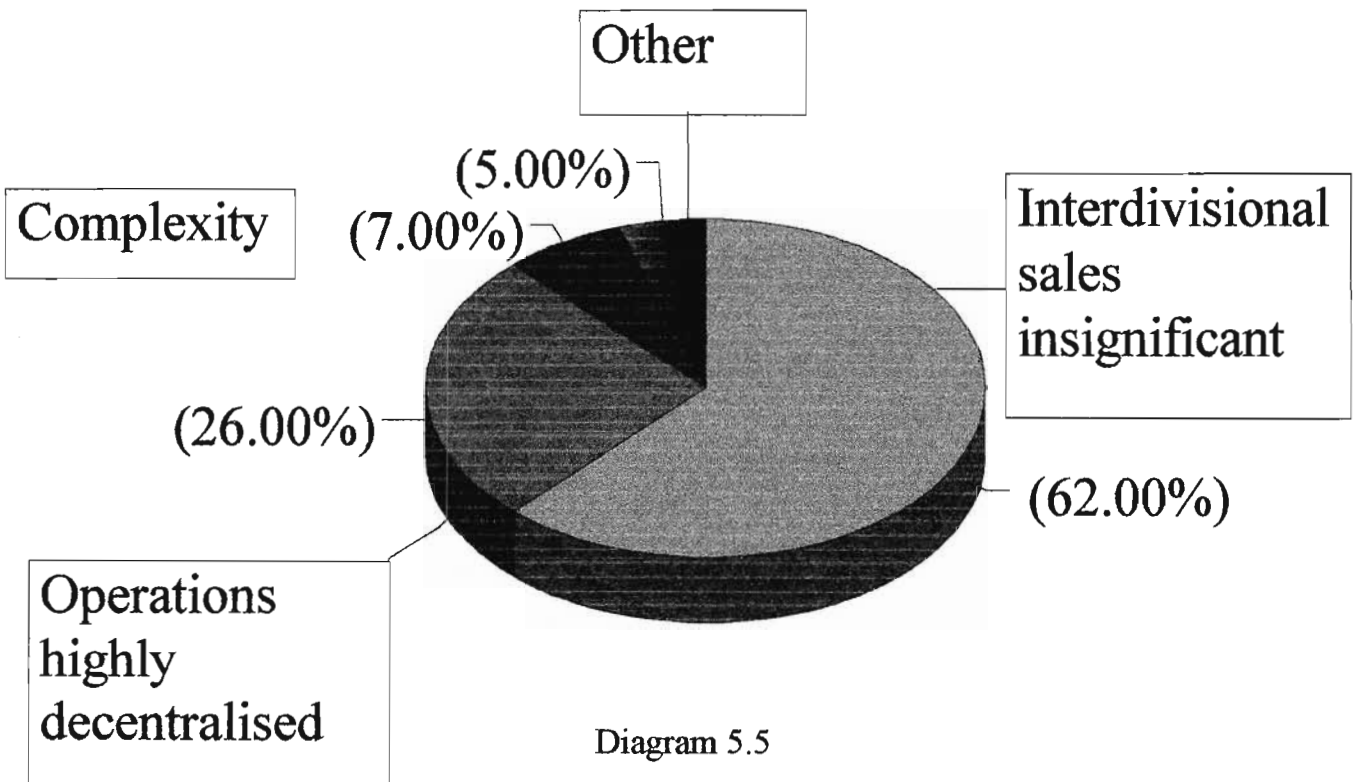


Diagram 5.5

**5.3 TRANSFER PRICING OBJECTIVES**

In the questionnaire, companies were asked to rate the importance of seven potential transfer pricing objectives on a five-point scale as follows:

	<u>Point value</u>
Extremely important	5
Very important	4
Moderately important	3
Not too important	2
Not at all important	1

The mean score for a particular objective was calculated by summing the scores for that objective and dividing by the number of responses. Table 5.8 presents a ranking of the objectives based on their mean scores.

The top two ranked objectives are in general compliance with the academic literature. The high rating accorded to divisional performance evaluation corroborates the exploratory findings in respect of S.A. companies reported by Geboers, et al. (1989).

It is surprising to note however, that the objective of goal congruence does not find its way into the top three rankings. The objective of simplicity and ease of application is rated more highly than goal congruence, which is ranked number four. One would not have expected this from a review of the transfer pricing literature which generally ignores the issue of simplicity and ease of application of a particular transfer pricing method and ranks goal congruence as one of the three main objectives of a transfer pricing system. Horngren (1997 6) suggests that “the primary criterion for choosing among alternative accounting systems is how well they help achieve organisational goals in relation to the costs of those systems.” It would appear that South African companies consider this principle as applied in the area of transfer pricing to be of much greater importance than has hitherto been considered. This finding in respect of goal congruence can also be contrasted with that of Wu & Sharp (1979) who found that U.S. companies rate goal congruence more highly than any other objective.

Table 5.8 Ranking of transfer pricing objectives

<u>Ranking</u>	<u>Objective</u>	<u>Mean-score</u>
1	To accurately determine the performance of divisions.	4.6
2	To promote divisional autonomy.	4.0
3	The method should be simple to understand and easy to apply.	3.9
4	To maximise consolidated group profit.	3.2
5	To comply with the rules and requirements of external financial reporting.	2.7
6	To minimise taxation payments.	2.5
7	To maximise turnover.	2.2

Companies were also asked to indicate the single most important or dominant objective of their transfer pricing systems. The distribution of the firms by dominant objective is presented in Table 5.9 and Diagram 5.6.

The vast majority of companies consider the objective of fair divisional performance evaluation to be singularly the most important objective to be attained by their transfer pricing systems, followed by goal congruence and then the promotion of divisional autonomy. Tang (1993) however found that in the case of U.S. companies the most frequently cited dominant objective is goal congruence followed by fair divisional performance evaluation.

Table 5.9 Distribution of respondents by dominant transfer pricing objective

<u>Objective</u>	<u>Number of companies</u>	<u>Frequency</u>
1. To accurately determine the performance of divisions.	40	55%
2. To maximise consolidated group profit.	20	27%
3. To promote divisional autonomy.	6	8%
4. To comply with the rules and requirements of external financial reporting.	3	4%
5. The method should be simple to under- stand and easy to apply in practice.	4	6%
	-----	-----
	73	100%
	-----	-----

# Dominant transfer pricing objective

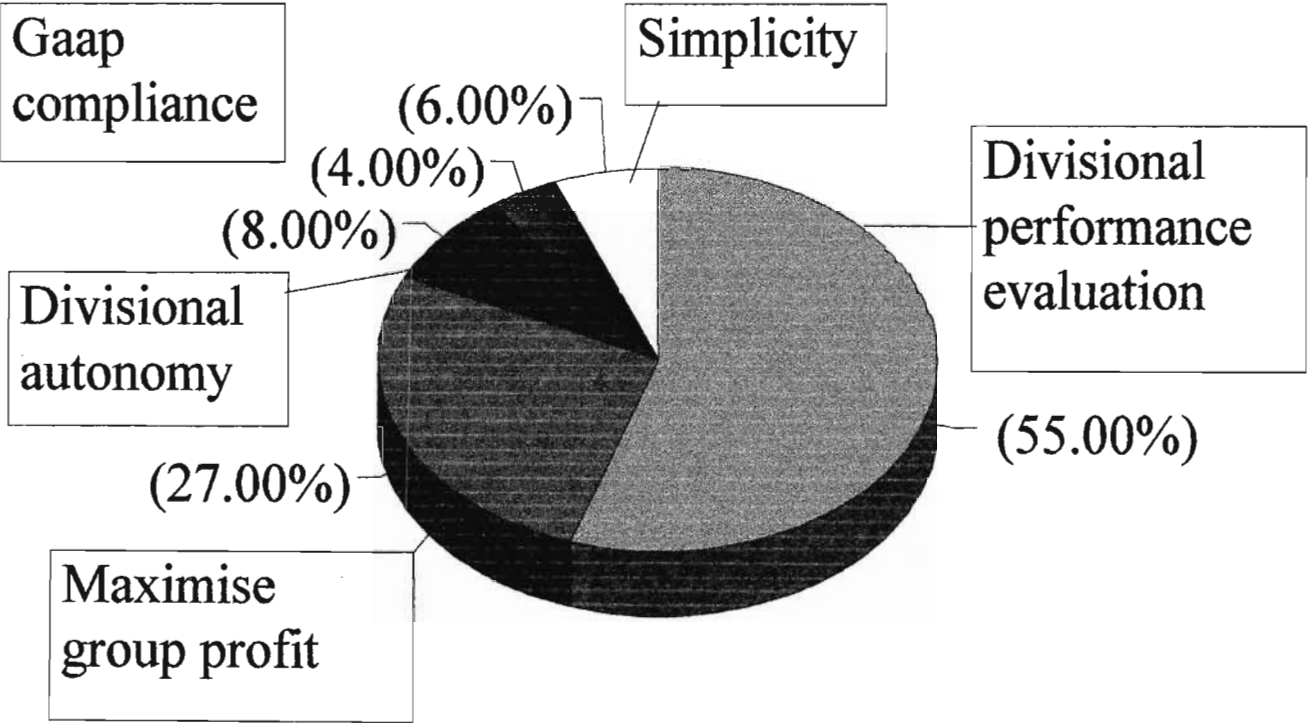


Diagram 5.6

**5.4 TRANSFER PRICING METHODS**

Number of transfer pricing methods used

Respondents were asked to indicate the number of transfer pricing methods used. The results are presented in Table 5.10 and Diagram 5.7 and indicate that 32% of companies use more than one transfer pricing method. While not as high as the 48% for U.S. companies reported by Tang (1993) this statistic reiterates the point made earlier that there is no single correct transfer pricing method to suit all circumstances and that even within a single group of companies it is frequently considered necessary to simultaneously apply more than one transfer pricing method.

Table 5.10 Number of domestic transfer pricing methods used

<u>Number of methods used</u>	<u>Number of companies</u>	<u>Frequency</u>
One	50	68%
Two	18	25%
Three	2	3%
Four	2	3%
Five	1	1%
	-----	-----
	73	100%
	-----	-----



## Number of transfer pricing methods used

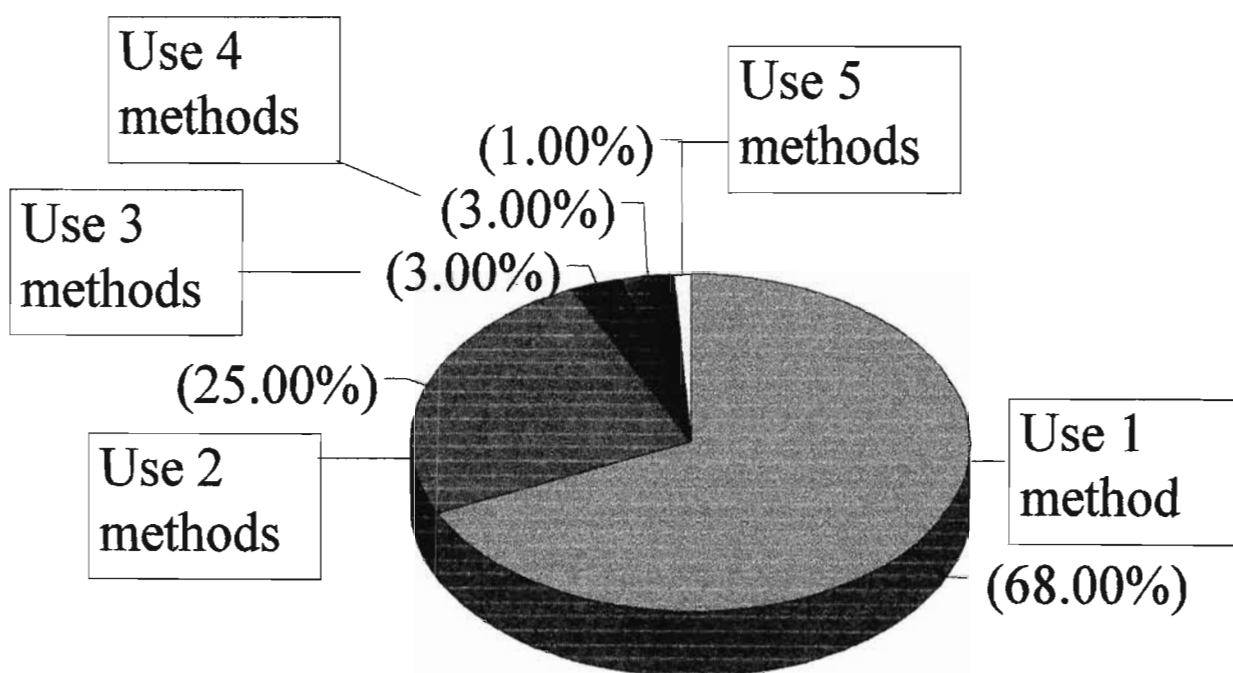


Diagram 5.7

### Primary transfer pricing methods used by respondent firms

In the questionnaire companies were asked to indicate all the transfer pricing methods used within the group. Those companies using more than one transfer pricing method were also asked to identify the main or dominant method used. In the case of companies using one transfer pricing method only, this method was considered to be the main method. Diagram 5.8 and Table 5.11 provide a summary of the main or primary transfer pricing methods used by the respondents. As can be seen from Diagram 5.8, overall companies have a slight preference for the use of non-cost oriented methods as their primary transfer pricing methods as opposed to cost-oriented methods. Table 5.11 indicates that the four most frequently used, and therefore the most important methods in practice are market price (30%), negotiated price (19%), full production cost plus profit (14%) and full production cost (14%). The use of economic marginal cost or its accounting approximation of variable cost is virtually non-existent with just one company using it. The use of other theoretical methods such as cost plus lumpsum subsidy and mathematical programming prices is totally non-existent. These findings are consistent with the findings of the empirical studies discussed in chapter three.

### Secondary transfer pricing methods used by respondent firms

Twenty three companies used more than one transfer pricing method. All methods used by these companies other than the one identified as the main method were classified as secondary methods. The extent of use of the various transfer pricing methods as secondary methods is summarised in Diagram 5.9 and Table 5.12. The most frequently used secondary method is negotiated price.

### Comparison of methods used with other studies

The findings of the current study in respect of the transfer pricing methods used by South African companies are compared with the findings of the two most recent widespread studies into domestic transfer pricing practices discussed in chapter three, namely Tang (1993) and Borkowski (1988). Since Tang did not separately identify secondary transfer pricing methods used but reported on all methods used and Borkowski reported on primary methods only, the comparative analysis will be split into two separate tables. Table 5.13 shows a comparison between the **primary** transfer pricing methods used by South African and U.S. companies while Table 5.14 reflects a comparison based on all transfer pricing methods used, ie. both primary and secondary

# Primary transfer pricing methods used

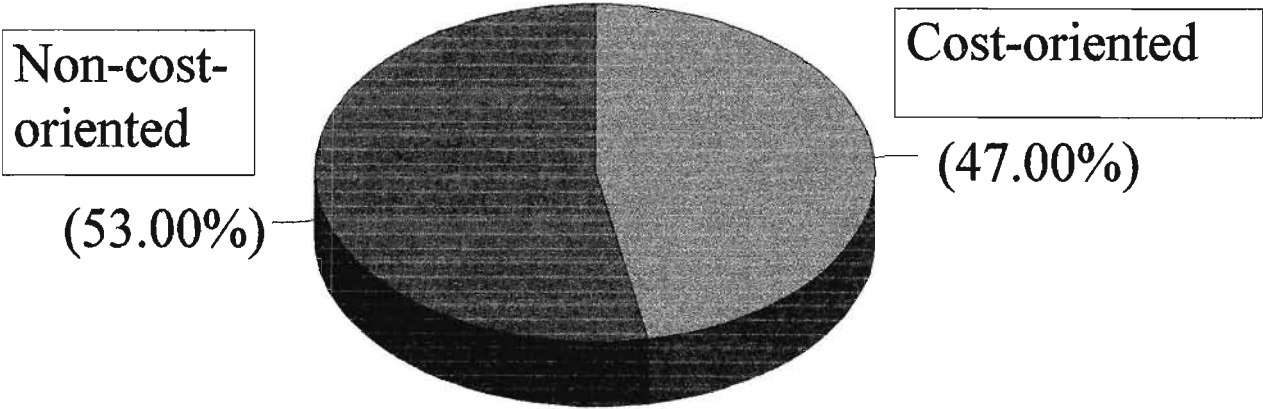


Diagram 5.8

Table 5.11 Primary transfer pricing methods used by respondent firms

<u>Pricing methods</u>	<u>Number of companies</u>	<u>Frequency</u>
Cost-oriented methods:	34	47%
Actual /standard variable production cost	1	1%
Actual /standard full production cost	10	14%
Actual /standard bought-in cost	6	8%
Variable production cost (actual or standard) plus a markup %	0	0%
Full production cost (actual or standard) plus a markup %	10	14%
Bought-in cost (actual or standard) plus a markup %	6	9%
Variable/full production cost /Bought-in cost (actual or standard) plus a lumpsum subsidy	0	0%
Other cost-oriented methods	1	1%
Non-cost-oriented methods:	39	53%
Market price	22	30%
Adjusted market price	3	4%
Negotiated price	14	19%
Mathematical programming price	0	0%
Total all methods	73	100%

## Secondary transfer pricing methods used

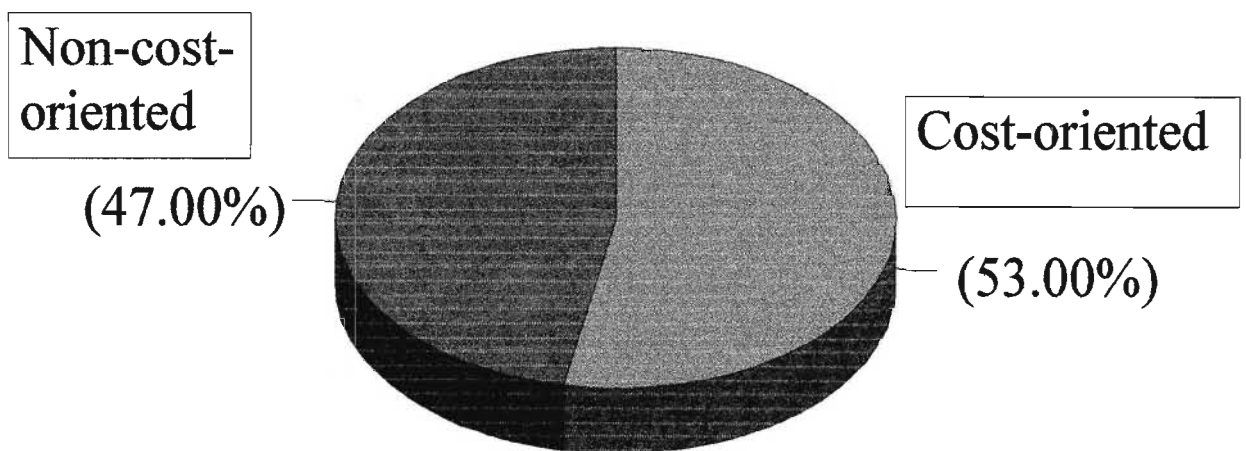


Diagram 5.9

Table 5.12 Secondary transfer pricing methods used by respondent firms

<u>Pricing methods</u>	<u>Number of times method cited</u>	<u>Frequency</u>
Cost-oriented methods:	17	53%
Actual /standard variable production cost	1	3%
Actual /standard full production cost	1	3%
Actual /standard bought-in cost	4	13%
Variable production cost (actual or standard) plus a markup %	0	0%
Full production cost (actual or standard) plus a markup %	6	19%
Bought-in cost (actual or standard) plus a markup %	5	15%
Variable/full production cost /Bought-in cost (actual or standard) plus a lumpsum subsidy	0	0%
Non-cost-oriented methods:	15	47%
Market price	2	6%
Adjusted market price	1	3%
Negotiated price	11	35%
Mathematical programming price	0	0%
Other non-cost-oriented methods	1	3%
Total all methods	32	100%

Table 5.13 A comparison of primary transfer pricing methods used

<u>Pricing methods</u>	<u>South Africa</u> Present study	<u>United States</u> *Borkowski (1988)
Cost-oriented methods:	47%	44%
Cost	23%	24%
Cost plus profit	23%	18%
Other cost-oriented methods	1%	2%
Non-cost-oriented methods:	53%	56%
Market price-based	34%	33%
Negotiated price	19%	23%
Total all methods	100%	100%

\*Source: Adapted from Borkowski, SC. 1988. *An investigation into the divergence of theory from practice regarding transfer pricing methods*. Ann Arbor: UMI. 96.

Table 5.14 A comparison of primary and secondary transfer pricing methods used

<u>Pricing methods</u>	<u>South Africa</u> Present study	<u>United States</u> *Tang (1993)
Cost-oriented methods:	49%	46%
Cost	22%	27%
Cost plus profit	26%	17%
Other cost-oriented methods	1%	2%
Non-cost-oriented methods:	51%	54%
Market price-based	25%	37%
Negotiated price	25%	17%
Other non-cost-oriented methods	1%	-
Total all methods	100%	100%

\*Source: Adapted from Tang Roger Y.W. 1993. *Transfer Pricing in the 1990s - Tax and management perspectives*. Westport: Quorum Books. 71.

methods. These two tables do not reflect material differences between the extent to which the various transfer pricing methods are used by South African and U.S. companies.

**5.5 OTHER POLICY ISSUES**

Responsibility for the selection of domestic transfer pricing methods

Respondents were asked to indicate who was responsible for the selection of the domestic transfer pricing methods used within the group. Table 5.15 shows the split between the different responsibility levels and this is graphically represented in Diagram 5.10. In most cases the method



Table 5.15 Responsibility for the selection of domestic transfer pricing methods

---

<u>Level of responsibility</u>	<u>Number of companies</u>	<u>Frequency</u>
1. Head office management	21	29%
2. Divisional management	20	27%
3. Head office management after close consultation with divisional management	32	44%
	-----	-----
	73	100%
	-----	-----

---

is selected by head office management after close consultation with the divisions. A similar finding was reported by Tang (1993) in respect of U.S. companies

#### Outside purchase policy

Respondents were asked to indicate whether they were permitted to purchase outside the group goods and services which are available internally. Their responses are presented in Table 5.16 and Diagram 5.11. In most cases divisions are only permitted to deal externally after obtaining head office approval. Again a similar finding was reported by Tang (1993) in respect of U.S. companies.

#### Settlement of transfer price disputes

Respondents were asked to indicate how transfer pricing disputes between divisions were normally settled. Their responses are presented in Table 5.17 and Diagram 5.12. In most cases transfer price disputes are resolved by head office management after close consultations with the divisions. In very few cases are disputes unilaterally resolved by head office management. Tang

# Responsibility for the selection of transfer pricing methods

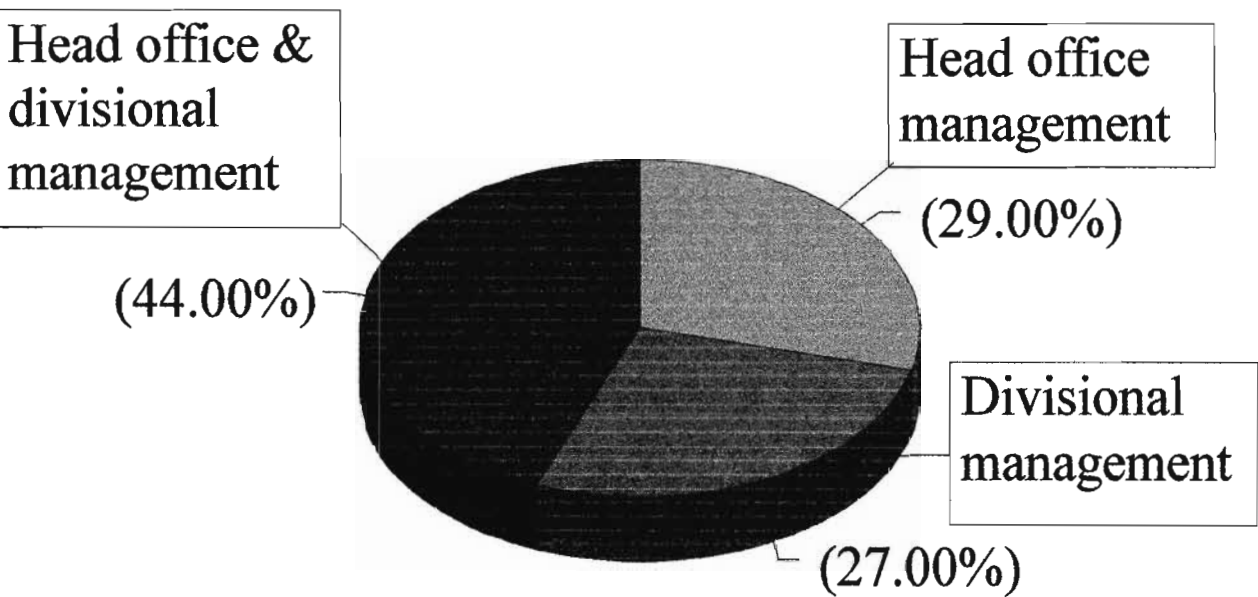


Diagram 5.10

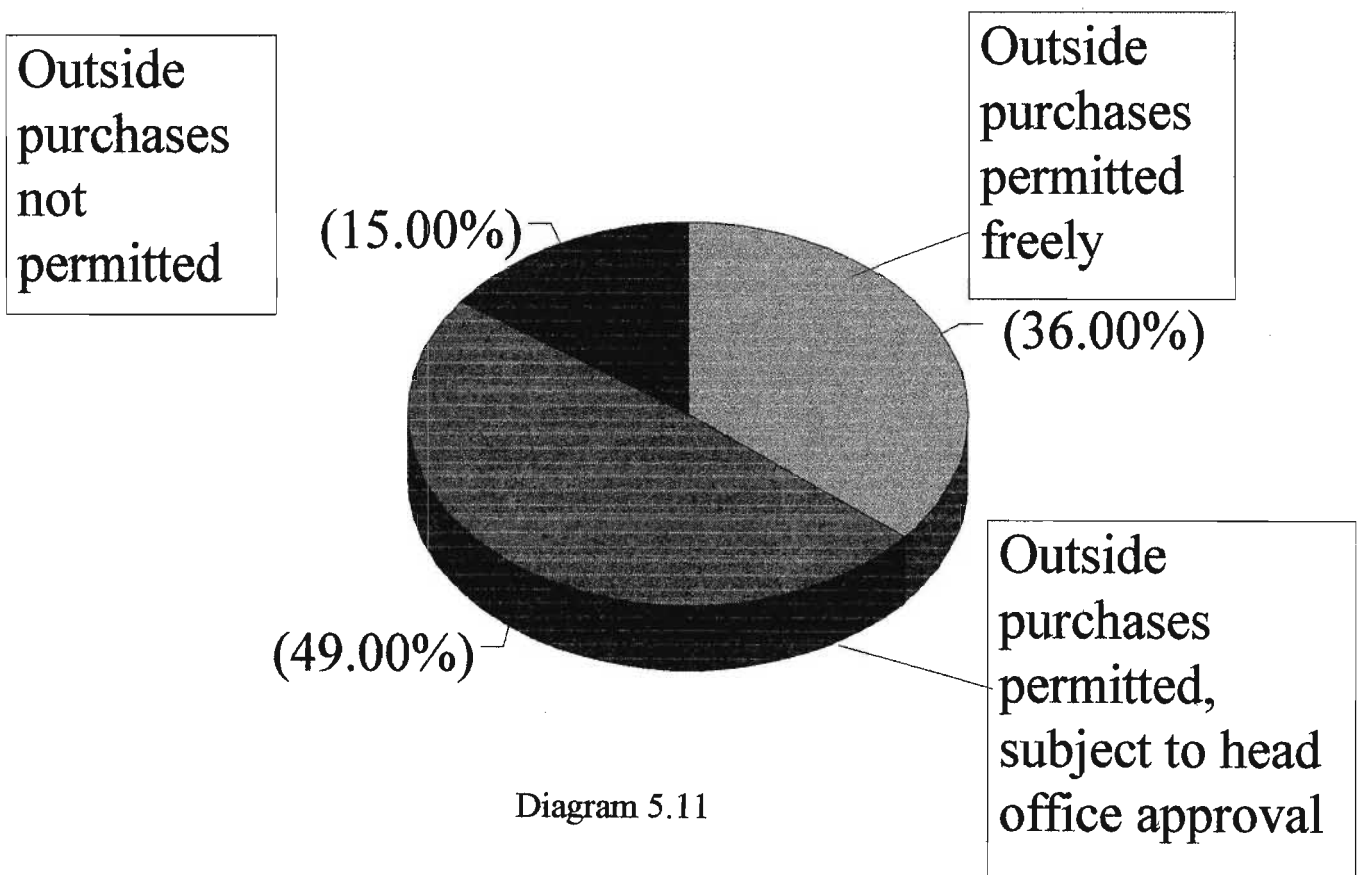
Table 5.16 Outside purchase policy

<u>Purchase policy</u>	<u>Number of companies</u>	<u>Frequency</u>
1. Permitted to purchase outside with complete freedom	26	36%
2. Permitted to purchase outside subject to head office approval	35	49%
3. Not permitted to purchase outside	11	15%
	-----	-----
	72*	100%
	-----	-----
*1 company reported no external source of supply		

Table 5.17 How transfer pricing disputes are normally settled

<u>How disputes settled</u>	<u>Number of companies</u>	<u>Frequency</u>
1. By head office management	6	9%
2. By the divisions themselves	28	39%
3. By head office management after close consultation with the divisions	37	52%
	-----	-----
	71*	100%
	-----	-----
*2 companies reported no disputes		

# Outside purchase policy



# Settlement of transfer price disputes

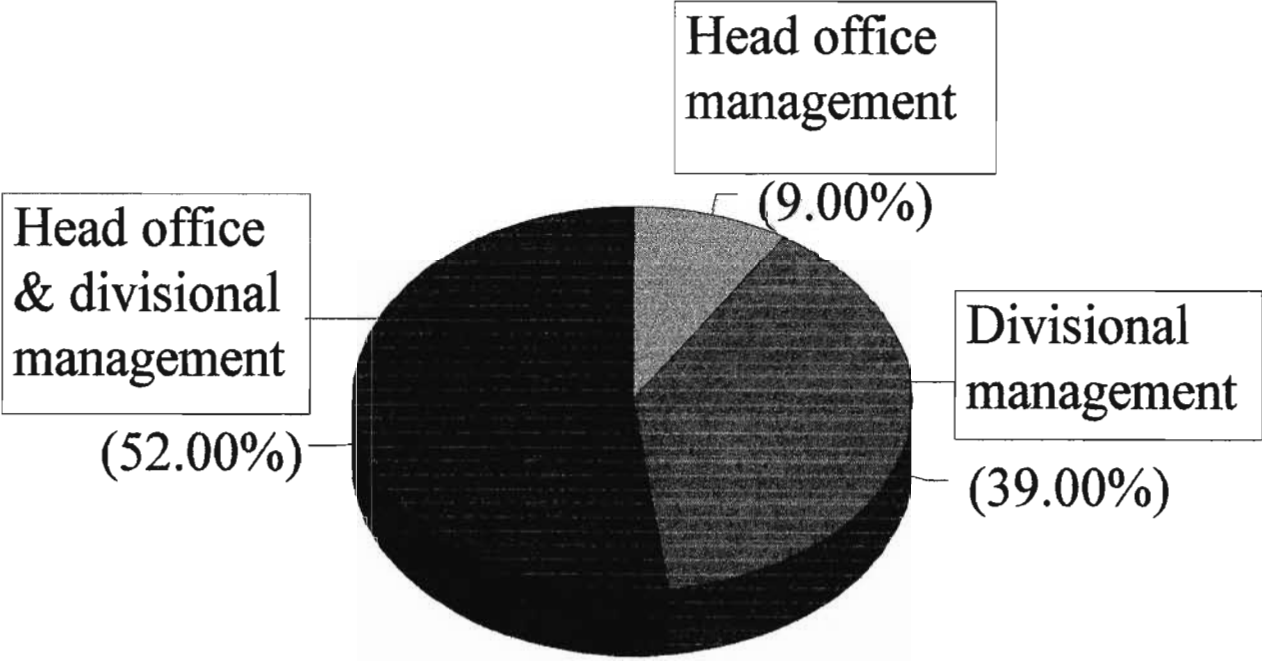


Diagram 5.12

(1993) on the other hand reported that most U.S. companies settled transfer price disputes through negotiations between the divisions themselves.

## **5.6 IDENTIFICATION OF HYPOTHESES**

Based on the literature review and the preliminary data analysis the following hypotheses are identified for specific testing:

**The extent of application of cost-oriented or non-cost-oriented domestic transfer prices among large listed South African industrial companies does not vary according to**

- 1) the size of these companies.**
- 2) the level of interdivisional trading within these companies.**
- 3) the main (ie. dominant) objective of these companies' transfer pricing systems.**
- 4) the responsibility level within these companies at which the transfer pricing method is selected.**
- 5) the outside purchase policies of these companies relating to goods and services available internally.**
- 6) the manner in which transfer pricing disputes between divisions are normally settled.**

## **5.7 IDENTIFICATION OF THE APPROPRIATE STATISTICAL TEST**

In hypotheses 1 to 6 above we wish to establish whether there is an association between the orientation of the transfer pricing method used by a company and a particular organisational variable. Letchford (1982: 88) identifies chi-square testing as an appropriate statistical test "when determining whether there is an association between two attributes which members of a population may or may not possess."

Under chi-square testing the null hypothesis always is that there is no association between

two attributes. If the computed chi-square value for a particular data set is greater than the critical test value then the null hypothesis is rejected, implying a relationship between the two attributes. On the other hand, if the computed chi-square value is less than the critical test value the hypothesis is accepted, implying the lack of a relationship between the two attributes. The critical test value is obtained from a standard chi-square distribution table.

In order to apply chi-square testing the data need to be arranged into contingency tables with appropriate row and column headings. Row totals and column totals are calculated by summing the observed values in each row and column. Expected values for each cell are computed according to the following formula:

$$\text{Expected cell value} = \frac{\text{Row total} * \text{Column total}}{\text{Number of observations}}$$

The computed chi-square value is then calculated according to the following formula:

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

where,  $\chi^2$  = computed chi-square value

O = observed contingency table cell value

E = expected contingency table cell value

The critical test value to be selected from a chi-square distribution table is a function of the level of significance (alpha risk or the risk of an incorrect rejection) and the degrees of freedom associated with the data set. Alpha risk for this study is set at 10%. The relevant degrees of freedom for a particular contingency table is objectively computed according to the following formula:

$$\text{d.f.} = (R-1) * (C-1)$$

where, d.f. = degrees of freedom

R = number of rows

C = number of columns

Cooper & Emory (1995 452) caution that chi-square testing should not be used if any of the expected cell values in a contingency table are less than 1 or if more than 20% of the cells in a contingency table have an expected value of less than 5. Should this occur they suggest that expected cell counts be increased by combining two or more categories, ie. collapsing the data into fewer categories.

## **5.8 HYPOTHESES TESTING**

### **Preliminary tests**

The statistical software package Minitab was used to generate computed chi-square values. Preliminary chi-square testing indicated that none of the contingency tables had expected cell counts of less than 1. However the contingency tables for hypotheses two, three and six reflected expected cell values of less than 5 for more than 20% of the cells. This made it necessary to collapse the data in these tables into fewer categories. This was achieved as follows:

1. In respect of hypothesis two the last two categories of % interdivisional transfers ie. "between 20 and 40%" and "above 40%" (refer Table 5.6) were combined into one category "greater than 20%."
2. In respect of hypothesis three, the three least frequently cited dominant objectives of divisional autonomy, gaap compliance and simplicity (refer Table 5.9) were combined into one category referred to as "miscellaneous."
3. In respect of hypothesis 6, the number of categories for the manner in which disputes are normally settled was reduced from three (see Table 5.17) to two by combining the categories of settlement "by head office management" and settlement "by head office management after close consultation with the divisions." This resulted in a contingency table with two categories only, ie. disputes normally settled with some head office intervention and disputes normally settled by the divisions themselves.



### Final tests

The final contingency tables for hypotheses 1 to 6 are presented in Tables 5.18 to 5.23. The data contained in these tables was fed into a computer using Minitab, a statistical software package. Details of the output generated by this program are included in Appendix C. Table 5.24 summarises the results of the statistical tests. As can be seen from Table 5.24 hypotheses 1, 3 and 5 cannot be rejected as in all cases the computed chi-square value is less than the critical test value. Hypotheses 2, 4 & 6 are however rejected because the computed chi-square value is greater than the critical test value at  $\alpha = 10\%$  in respect of hypothesis 2 and  $\alpha = 1\%$  in respect of hypotheses 4 & 6.

### Specific conclusions

1. The finding in respect of company size (hypothesis 1) coincides with Tang's (1993) findings in respect of U.S. companies, ie. there is no association between company size and the orientation of the transfer pricing method used.
2. The finding in respect of hypothesis two suggests that companies with a low level of interdivisional trading (less than 20%) have a tendency to use non-cost oriented transfer pricing methods whereas companies with a high level of interdivisional trading (greater than 20%) prefer to use cost-oriented methods.
3. The finding in respect of transfer pricing objectives (hypothesis 3) conflicts with that of Borkowski (1988). Borkowski found that in respect of U.S. companies there is an association between transfer pricing objectives and the type of transfer pricing method used. No such association is evident in the case of South African companies.
4. The specific conclusion to be drawn by rejecting hypothesis 4 is that there is a significant association between the responsibility level within the organisation at which the transfer price is selected and the type of transfer price used. Borkowski (1988) also reported a similar finding. Specifically, the findings of the current study are that transfer price methods selected as a result of some head office management involvement tend to be cost-oriented whereas methods selected by divisional management themselves tend to be non-cost-oriented.

Table 5.18 Hypothesis 1: Company size and the orientation of domestic transfer pricing methods

<u>Total assets (R million)</u>				
<u>Transfer pricing method</u>	<u>Less than R 200</u>	<u>Between R 200 and R 1 000</u>	<u>Above R 1 000</u>	<u>Total</u>
Cost-oriented	14	15	5	34
Non-cost-oriented	10	17	12	39
	-----	-----	-----	-----
	24	32	17	73
	-----	-----	-----	-----

Table 5.19 Hypothesis 2: Level of interdivisional trading and the orientation of domestic transfer pricing methods

<u>Level of interdivisional trading</u>					
<u>Transfer pricing method</u>	<u>less than 5%</u>	<u>5 to 10%</u>	<u>10 to 20%</u>	<u>greater than 20%</u>	<u>Total</u>
Cost-oriented	13	6	4	11	34
Non-cost-oriented	13	9	12	5	39
	-----	-----	-----	-----	-----
	26	15	16	16	73
	-----	-----	-----	-----	-----

Table 5.20 Hypothesis 3: The main transfer pricing objective and the orientation of domestic transfer pricing methods

<u>Main transfer pricing objective</u>				
<u>Transfer pricing method</u>	<u>Goal</u> <u>congruence</u>	<u>Performance</u> <u>evaluation</u>	<u>Miscell-</u> <u>aneous</u>	<u>Total</u>
Cost-oriented	6	21	7	34
Non-cost-oriented	14	19	6	39
	-----	-----	-----	-----
	20	40	13	73
	-----	-----	-----	-----

Table 5.21 Hypothesis 4: Responsibility for transfer price selection and the orientation of domestic transfer pricing methods

<u>Method selected by</u>				
<u>Transfer pricing method</u>	<u>Head office</u> <u>management</u>	<u>Divisional</u> <u>management</u>	<u>Head office</u> <u>&amp; division</u>	<u>Total</u>
Cost-oriented	14	2	18	34
Non-cost-oriented	7	18	14	39
	-----	-----	-----	-----
	21	20	32	73
	-----	-----	-----	-----

Table 5.22 Hypothesis 5: Outside purchase policy and the orientation of domestic transfer pricing methods

<u>Transfer pricing method</u>	<u>Outside purchase policy</u>			<u>Total</u>
	<u>*Policy 1</u>	<u>**Policy 2</u>	<u>***Policy 3</u>	
Cost-oriented	9	16	8	33
Non-cost-oriented	17	19	3	39
	-----	-----	-----	----
	26	35	11	72****
	-----	-----	-----	----

\*Policy 1 - Permitted to purchase outside with complete freedom

\*\*Policy 2 - Permitted to purchase outside subject to head office approval

\*\*\*Policy 3 - Not permitted to purchase outside

\*\*\*\* 1 company reported no external source of supply

Table 5.23 Hypothesis 6: Manner of settling transfer price disputes and the orientation of domestic transfer pricing methods

<u>Transfer pricing method</u>	<u>Disputes settled by</u>		<u>Total</u>
	<u>Some head office involvement</u>	<u>Divisional management</u>	
Cost-oriented	25	7	32
Non-cost-oriented	18	21	39
	-----	-----	----
	43	28	71*
	-----	-----	----

\*2 companies reported no disputes

Table 5.24 Summary of statistical tests

<u>Hypothesis</u>	<u>Computed</u> <u>chi-square</u>	<u>Degrees of</u> <u>freedom</u>	<u>Critical test value</u>		
			<u>10%</u> <u>significance</u>	<u>5%</u> <u>significance</u>	<u>1%</u> <u>significance</u>
1	3.347	2	4.60*		
2	6.538	3	6.25**		
3	3.049	2	4.60*		
4	15.363	2	4.60**	5.99**	9.21**
5	4.523	2	4.60*		
6	7.523	1	2.71**	3.84**	6.64**

\* Relationship is not significant - hypothesis cannot be rejected

\*\* Relationship is significant - hypothesis may be rejected

5. The failure to reject hypothesis 5 suggests that the outside purchase policies of a company in respect of intermediate products appear to have no association with the choice of transfer pricing method.

6. The conclusion to be drawn from rejecting hypothesis 6 is that there is a significant association between the manner in which divisional transfer price disputes are normally settled and the orientation of the transfer pricing method used. Specifically, in those companies in which disputes are normally settled by some form of head office management involvement cost-oriented transfer pricing methods tend to be used, whereas in the case of companies in which disputes are settled by the divisions themselves without any head office intervention, non-cost-oriented methods are more likely to be used.

## **5.9 CONCLUSION**

In this chapter the characteristics of the respondent firms were analysed and the research findings presented. Where appropriate comparisons were made with the findings of previous studies. The research findings may be summarised as follows:

### **Transfer pricing objective**

South African companies identify the facilitation of fair divisional performance evaluation as the most important objective to be achieved by their domestic transfer pricing systems.

### **Transfer pricing method**

Singularly, the most popular primary transfer pricing method used by South African companies is market price.

### **The responsibility for the selection of the transfer pricing method**

In most South African companies, the transfer pricing method to be used is selected by head office management after close consultation with divisional management.

### **Outside purchase policy**

In most South African companies, divisions are permitted to purchase from outside the group goods and services which are available internally, provided approval to do so is obtained from head office.

### **Settlement of transfer price disputes**

In most cases, transfer price disputes between divisions are normally settled by head office management after close consultation with the divisions.

### **Organisational variables and the choice of transfer pricing methods**

No significant association was found between the organisational variables listed below and a firm's choice of transfer price:

1. Size.
2. Main transfer pricing objective.
3. Outside purchase policy.

There is however a significant association between the following three organisational variables and the choice of transfer price:

1. The level of interdivisional trading
2. The level of responsibility at which the transfer pricing method is selected.
3. The manner in which divisional transfer price disputes are normally settled.

Specifically it was found that firstly, companies with a low level of interdivisional trading use non-cost-oriented transfer pricing methods whereas companies with a high level of interdivisional trading use cost-oriented methods.

Secondly, it was found that transfer pricing methods selected as a result of some head office management involvement tend to be cost-oriented methods whereas those methods selected by the divisions themselves tend to be non-cost-oriented methods.

Thirdly, the manner in which disputes between divisions are normally settled also correlates with a firm's choice of transfer price. In companies where disputes are normally settled by some form of head office intervention, cost-oriented methods tend to be used. Where disputes are normally settled by the divisions themselves non-cost-oriented methods tend to be used.

The latter two findings would tend to suggest that the more centralised the decision making process within a group is, the more likely is it to use a cost-oriented method. On the other hand less centralised groups are more likely to use non-cost-oriented transfer pricing methods.

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## CHAPTER 6

### CONCLUSION

#### **6.1 SUMMARY OF FINDINGS**

An analysis of transfer pricing theory suggests that there is no single correct transfer pricing method to suit all circumstances. Each method has its advantages and disadvantages, depending on the circumstances. The most appropriate method to suit a particular set of circumstances is dependant on those circumstances.

A review of past empirical studies into transfer pricing practices suggests that the economic theories of Hirshleifer and complex mathematical programming methods find little support by way of practical application. Despite academic criticism of full cost based methods, such methods enjoy considerable support in practice, perhaps because of their ease of application.

The findings of the empirical investigation may be summarised as follows. The main objective of the transfer pricing systems employed by large listed South African industrial companies is the facilitation of fair divisional performance evaluation. Overall, the transfer pricing methods used by South African companies are fairly evenly spread between cost and non-cost oriented methods. Singularly, the most frequently used primary method is market price. Policies relating to the selection of the transfer pricing method, the purchase of intermediate goods and services and the settlement of transfer pricing disputes reflect some head office management involvement in the transfer price decision process in most cases.

A significant association was found between the following three organisational variables and a firm's choice of transfer pricing method:

1. The level of interdivisional trading.
2. The level of responsibility within the organisation at which the transfer pricing method is selected.
3. The manner in which divisional transfer price disputes are normally settled.

## **6.2 LIMITATIONS OF THE RESEARCH**

1. The population surveyed consisted of large listed South African industrial companies. The results of the research may therefore not be extended to non-industrial, unlisted or small companies.
2. Certain organisational variables were tested for association with the orientation of the transfer pricing methods used. Perhaps other more significant variables impacting on a firm's choice of transfer pricing method exist and have been ignored for testing (Borkowski 1988 52).
3. Whilst the survey responses were reviewed for internal inconsistencies (and three questionnaires were in fact excluded from the count of usable responses because of internal inconsistencies) the validity of the responses is difficult to assess. Not all responses were completed by the group financial director. Thus the persons completing the questionnaires may not in all cases be ideally suited to do so.

## **6.3 AREAS FOR FUTURE RESEARCH**

1. There is a greater frequency of transfer price usage amongst companies with total assets between R200 million and R1 000 million than the largest companies with assets above R1 000 million. This is an unexpected finding and the reasons therefore need to be investigated more thoroughly.
2. The reason for the significant relationship between the three organisational variables (1. level of interdivisional trading, 2. responsibility for the selection of the transfer pricing method and 3. the manner of settling disputes) and the orientation of the transfer pricing method needs to be investigated further. Is there a special reason for this or are the relationships merely coincidental?
3. No significant association was found between the main transfer pricing objective and the orientation of the transfer pricing system. On what basis then do firms select a particular transfer pricing method? Perhaps a case study research focussing on a small group of companies could be

undertaken to study this more in depth.

4. The scope of the study was limited to domestic transfer pricing. A future study could investigate the international dimensions of transfer pricing from a South African perspective. This is likely to become increasingly important for South African companies as exchange control regulations on outward investment are dismantled and South African companies engage in more international trade.

5. The survey covered listed companies only. The transfer pricing practices of unlisted entities could be investigated.

6. Only industrial companies were investigated in this study. A future study could focus on transfer pricing practices in the mining and financial services industries. Perhaps a comparative analysis could be undertaken of the practices in these industries.

#### **6.4 REFERENCE**

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## APPENDIX A: Pilot Survey Questionnaire

25 November 1996

The Financial Director  
X Limited  
PO Box 123  
Durban  
4000

Dear Sir

**An investigation into the domestic transfer pricing practices of large listed South African industrial companies**

Enclosed please find a questionnaire relating to the above topic. Completion of the questionnaire requires approximately 10-12 minutes of your valuable time and a maximum of only 9 questions will have to be answered by you. These questions are easily answerable by placing an "X" in the appropriate box.

Respondents are assured that no company will be identified by name in any report emanating from this study nor will the questionnaires be made available to any other person.

**By responding to this questionnaire you are assisting me greatly in the successful completion of my Masters dissertation and I thank you for your co-operation.**

**All respondents to the questionnaire will be provided with a free copy of a report summarising the results of the study.**

A stamped return envelope is enclosed for your convenience.

Yours sincerely

Imtiaz Vally  
Senior lecturer

## SURVEY QUESTIONNAIRE

Company:

### AN INVESTIGATION INTO THE DOMESTIC TRANSFER PRICING PRACTICES OF LARGE LISTED SOUTH AFRICAN INDUSTRIAL COMPANIES

#### INTRODUCTION

This questionnaire is designed to obtain information relating to the **domestic** transfer pricing practices of large listed South African industrial companies. Whilst all questions may be answered by simply placing an "X" in the appropriate box you may provide additional comments wherever you wish.

For the purposes of this questionnaire the following terms are used as defined:

**TRANSFER PRICE:** The price that is attached to goods and services that are transferred between the parent company and divisions or between divisions/branches of the same group.

**GOODS AND SERVICES:** Allocations of central administrative overhead expenses are excluded from the definition of goods and services.

**DOMESTIC TRANSFERS:** Transfers that take place **within the borders of the Republic only**. International interdivisional transfers fall beyond the scope of this questionnaire and are to be ignored.

#### QUESTION 1

Please provide an estimate of the value of **domestic** interdivisional transfers as a proportion of total group sales.

- |                       |                          |
|-----------------------|--------------------------|
| Less than 5 %         | <input type="checkbox"/> |
| Between 5 % and 10 %  | <input type="checkbox"/> |
| Between 10 % and 20 % | <input type="checkbox"/> |
| Between 20 % and 40 % | <input type="checkbox"/> |
| Above 40 %            | <input type="checkbox"/> |

#### QUESTION 2

Does your group use transfer pricing to account for the **domestic** interdivisional transfers of goods and services?

Yes ☐

If yes please continue with the rest of the questionnaire.

No ☐

If no, please skip to question 10.

/QUESTION 3

**QUESTION 3**

Please indicate below the transfer pricing methods that are used within your group to account for the **domestic** interdivisional transfers of goods and services. (You may check more than one method if more than one method is used.)

Market price	<input type="checkbox"/>
Market price less selling expenses	<input type="checkbox"/>
Negotiated price	<input type="checkbox"/>
Mathematical programming price	<input type="checkbox"/>
Actual variable production cost	<input type="checkbox"/>
Standard variable production cost	<input type="checkbox"/>
Actual full production cost	<input type="checkbox"/>
Standard full production cost	<input type="checkbox"/>
Actual bought-in cost	<input type="checkbox"/>
Standard bought-in cost	<input type="checkbox"/>
Variable production cost (actual or standard) plus a markup %	<input type="checkbox"/>
Full production cost (actual or standard) plus a markup %	<input type="checkbox"/>
Bought-in cost (actual or standard) plus a markup %	<input type="checkbox"/>
Variable production cost (actual or standard) plus a lumpsum subsidy	<input type="checkbox"/>
Full production cost (actual or standard) plus a lumpsum subsidy	<input type="checkbox"/>
Bought-in cost (actual or standard) plus a lumpsum subsidy	<input type="checkbox"/>
Other (please specify)..... .....	<input type="checkbox"/>

/QUESTION 4

**QUESTION 4**

If you checked only one method in question 3 please skip this question and continue with question 5. If you checked more than one method in question 3 please indicate below which is the single most important (ie. dominant) **domestic** transfer pricing method used within your group. You may check **one** method only.

Market price	<input type="checkbox"/>
Market price less selling expenses	<input type="checkbox"/>
Negotiated price	<input type="checkbox"/>
Mathematical programming price	<input type="checkbox"/>
Actual variable production cost	<input type="checkbox"/>
Standard variable production cost	<input type="checkbox"/>
Actual full production cost	<input type="checkbox"/>
Standard full production cost	<input type="checkbox"/>
Actual bought-in cost	<input type="checkbox"/>
Standard bought-in cost	<input type="checkbox"/>
Variable production cost (actual or standard) plus a markup %	<input type="checkbox"/>
Full production cost (actual or standard) plus a markup %	<input type="checkbox"/>
Bought-in cost (actual or standard) plus a markup %	<input type="checkbox"/>
Variable production cost (actual or standard) plus a lumpsum subsidy	<input type="checkbox"/>
Full production cost (actual or standard) plus a lumpsum subsidy	<input type="checkbox"/>
Bought-in cost (actual or standard) plus a lumpsum subsidy	<input type="checkbox"/>
Other (please specify)..... .....	<input type="checkbox"/>

/QUESTION 5

**QUESTION 5**

Listed below are various objectives that a **domestic** transfer pricing system may be designed to achieve. Please indicate the degree of importance that your group places upon each of the objectives when formulating its **domestic** transfer pricing policies.

	EI <sup>1</sup>	VI <sup>2</sup>	MI <sup>3</sup>	NtI <sup>4</sup>	Naal <sup>5</sup>
To comply with the rules and requirements of external financial reporting (ie. Gaap compliance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To maximise consolidated group profit (ie. promote goal congruence)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The method should be simple to understand and easy to apply in practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To minimise taxation payments (Income tax, Vat, RSC levies etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To accurately determine the performance of divisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To promote divisional autonomy (ie. independence)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To maximise turnover (sales)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 1. EI = Extremely Important
- 2. VI =Very Important
- 3. MI= Moderately Important
- 4. NtI= Not too Important
- 5. Naal= Not at all Important

/QUESTION 6

### QUESTION 6

Which transfer pricing objective does your group consider to be the single most important (ie. dominant) objective to be achieved by its **domestic** transfer pricing system? You may check one box only.

To comply with the rules and requirements of external financial reporting (ie. Gaap compliance)

☐

To maximise consolidated group profit (ie. promote goal congruence)

☐

The method should be simple to understand and easy to apply in practice

☐

To minimise taxation payments (Income tax, Vat, RSC levies etc)

☐

To accurately determine the performance of divisions

☐

To promote divisional autonomy (ie. independence)

☐

To maximise turnover (sales)

☐

### QUESTION 7

Who is responsible for the selection of the domestic transfer pricing methods used within your group?

Head office management

☐

Divisional management

☐

Head office management after close consultation with divisional management

☐

Other (please specify).....  
.....

☐

/QUESTION 8

**QUESTION 8**

Are domestic divisions permitted to purchase from outside the group goods and services which are available internally?

- Yes, with complete freedom ☐
- Yes, subject to head office approval ☐
- No ☐
- No external source of supply ☐

**QUESTION 9**

How are transfer pricing disputes between divisions settled?

- By head office management ☐
- By the divisions themselves ☐
- By head office management after close consultation with the divisions ☐
- Other (please specify)..... ☐
- .....

**QUESTION 10**

This question should be answered only if your answer to question 2 was no. If your group does not use transfer pricing **domestically** please indicate the reason for not doing so.

- The volume of **domestic** interdivisional sales is insignificant ☐
- A transfer pricing system is too complicated to operate ☐
- Other (please specify)..... ☐
- .....
- .....

**Completed by:**

Name ..... Signature .....

Title ..... Date .....

**THANK YOU. YOUR CO-OPERATION IS MOST APPRECIATED**



## **Appendix B: Follow-up Letter**

23 December 1996

The Financial Director  
X Limited  
PO Box 123  
Durban  
4000

Dear Sir

### **An investigation into the domestic transfer pricing practices of large listed South African industrial companies**

A questionnaire relating to the above topic was mailed to you on 25 November 1996. If you have already completed and returned the questionnaire, I thank you for your co-operation.

If you have not returned the questionnaire this is a reminder that your company's input is very important to the interpretation of the final survey results. Your company was included in this survey because it features in the 1996 Financial Mail Survey of Top Companies. In view of the importance of your company to the South African economy therefore, it is important that data relating to your company are included in the survey.

Respondents are assured that no company will be identified by name in any report emanating from this study nor will the questionnaires be made available to any other persons.

Please assist with the success of this project as other companies already have. A copy of the questionnaire is attached and a reply-paid envelope is enclosed for your convenience.

Yours sincerely

Imtiaz Vally  
Senior lecturer

**Appendix C: Detailed Chi-square Tests**

MTB > ChiSquare c1-c3.

**Chi-Square Test**

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	14	15	5	34
	11.18	14.90	7.92	
2	10	17	12	39
	12.82	17.10	9.08	
Total	24	32	17	73

ChiSq = 0.712 + 0.001 + 1.075 +  
0.621 + 0.001 + 0.937 = 3.347  
df = 2, p = 0.188

MTB > ChiSquare c1-c4.

**Chi-Square Test**

Expected counts are printed below observed counts

	C1	C2	C3	C4	Total
1	13	6	4	11	34
	12.11	6.99	7.45	7.45	
2	13	9	12	5	39
	13.89	8.01	8.55	8.55	
Total	26	15	16	16	73

ChiSq = 0.065 + 0.139 + 1.599 + 1.689 +  
0.057 + 0.121 + 1.394 + 1.473 = 6.538  
df = 3, p = 0.089

MTB > ChiSquare c1-c3.

**Chi-Square Test**

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	6	21	7	34
	9.32	18.63	6.05	
2	14	19	6	39
	10.68	21.37	6.95	
Total	20	40	13	73

ChiSq = 1.180 + 0.301 + 0.148 +  
1.029 + 0.263 + 0.129 = 3.049  
df = 2, p = 0.218

MTB > ChiSquare c1-c3.

### Chi-Square Test

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	14 9.78	2 9.32	18 14.90	34
2	7 11.22	18 10.68	14 17.10	39
Total	21	20	32	73

ChiSq = 1.820 + 5.744 + 0.643 +  
1.587 + 5.008 + 0.561 = 15.363  
df = 2, p = 0.000

MTB > ChiSquare c1-c3.

### Chi-Square Test

Expected counts are printed below observed counts

	C1	C2	C3	Total
1	9 11.92	16 16.04	8 5.04	33
2	17 14.08	19 18.96	3 5.96	39
Total	26	35	11	72

ChiSq = 0.714 + 0.000 + 1.736 +  
0.604 + 0.000 + 1.469 = 4.523  
df = 2, p = 0.105

MTB > ChiSquare c1-c2.

### Chi-Square Test

Expected counts are printed below observed counts

	C1	C2	Total
1	25 19.38	7 12.62	32
2	18 23.62	21 15.38	39
Total	43	28	71

ChiSq = 1.630 + 2.503 +  
1.337 + 2.053 = 7.523  
df = 1, p = 0.006

MTB >