

Control and Planning Systems for Transfer Pricing

Divisionalized organizational structure

- Large companies produce and sell a wide variety of products throughout the world.
- Because of the complexity of operations, it is difficult for top management to directly control operations.
- It may therefore be appropriate to shape a **divisionalized organizational structure**:
 - Divide a company into separate self-contained segments or divisions.
 - Allow divisional managers to operate with a great deal of independence.
 - A divisional manager has responsibility for both the production and marketing activities of the division.
- The danger in creating autonomous divisions is that divisional managers might not pursue goals that are in the best interests of the company as a whole.

Investment centres, profit centres and cost centres

- The creation of separate divisions may lead to the delegation of different degrees of authority; for example, in some organizations a divisional manager may also have responsibility for making capital investment decisions. Where this situation occurs, the division is known as an **investment centre**.
- Alternatively, where a manager cannot control the investment and is responsible only for the profits obtained from operating the assets assigned to him or her by corporate headquarters, the segment is referred to as a **profit centre**.
- In contrast, the term **cost centre** is used to describe a **responsibility centre** where a manager is responsible for costs but not profits.

Investment centres, profit centres and cost centres

- Divisionalization can improve the decision-making process both from the point of view of the quality of the decision and the speed of the decision.
 - Decisions can be made by the person who is familiar with the situation and who should therefore be able to make more informed judgements than central management who cannot be intimately acquainted with all the activities of the various segments of the business.
 - Speedier decisions should also occur because information does not have to pass along the chain of command to and from top management. Decisions can be made on the spot by those who are familiar with the product lines and production processes and who can react to changes in local conditions in a speedy and efficient manner.
 - Delegation of responsibility to divisional managers provides them with greater freedom, thus making their activities more challenging and providing the opportunity to achieve self-fulfilment and greater motivation.
- The major potential disadvantage of divisionalization is that there is a danger that:
 - Divisions may compete with each other excessively.
 - Divisional managers may be encouraged to take action that will increase their own profits at the expense of the profits of other divisions and the company as a whole.

Prerequisites for successful divisionalization

- A divisionalized structure is most suited to large companies that are engaged in several dissimilar activities. Examples: Unilever, Siemens AG, Mitsubishi Group and Samsung.
- The reason is that it is difficult for top management to be intimately acquainted with all the diverse activities of the various segments of the business.
- When the major activities of a company are closely related, these activities should be carefully coordinated, and this coordination is more easily achieved in a centralized organizational structure.
- **BUT:**
- Even though substantial independence of divisions from each other is a necessary condition for divisionalization, if carried to the limit it would destroy the very idea that such divisions are an integral part of any single business (Solomons, 1965).
- Divisions should be more than investments – they should contribute not only to the success of the company but to the success of each other.

Pre-requisites for successful divisionalization – divisions at Siemens AG

Germany global company Siemens AG had a turnover of almost €76 billion in 2010, recording a profit after taxes of €4 billion, according to its annual report. The company operates globally, with 405 000 employees at 1640 locations in 190 countries. Siemens is a diverse organization. Looking at the home page of the company's website (www.siemens.com), we get an idea of how diverse. The web page presents 11 'product groups':

- Automation
- Building technologies
- Communication networks
- Consumer products
- Drive technology
- Energy
- Financial solutions
- Healthcare
- IT solutions and services
- Lighting
- Mobility

Each product group is further broken down. For example, the automation product group includes

sub-products such as operator control and monitoring systems, industrial control, industrial communication and sensor systems. These products and sub-products are suggesting a quite detailed organizational structure. Looking at the 'about' page of the website, the company is portrayed as serving three 'sectors': industry, energy and healthcare. While the website does not tell us the exact internal structures, we could expect that these three sectors are subdivided into a divisional structure, given the diverse nature of the product groups above. Some activities (e.g. financial solutions) may be cross-sector and/or cross divisional too.

Questions

- 1 What advantages does a divisionalized structure have for decision-making at Siemens?
- 2 Would a divisionalized structure be suited to fast-food giant McDonalds?

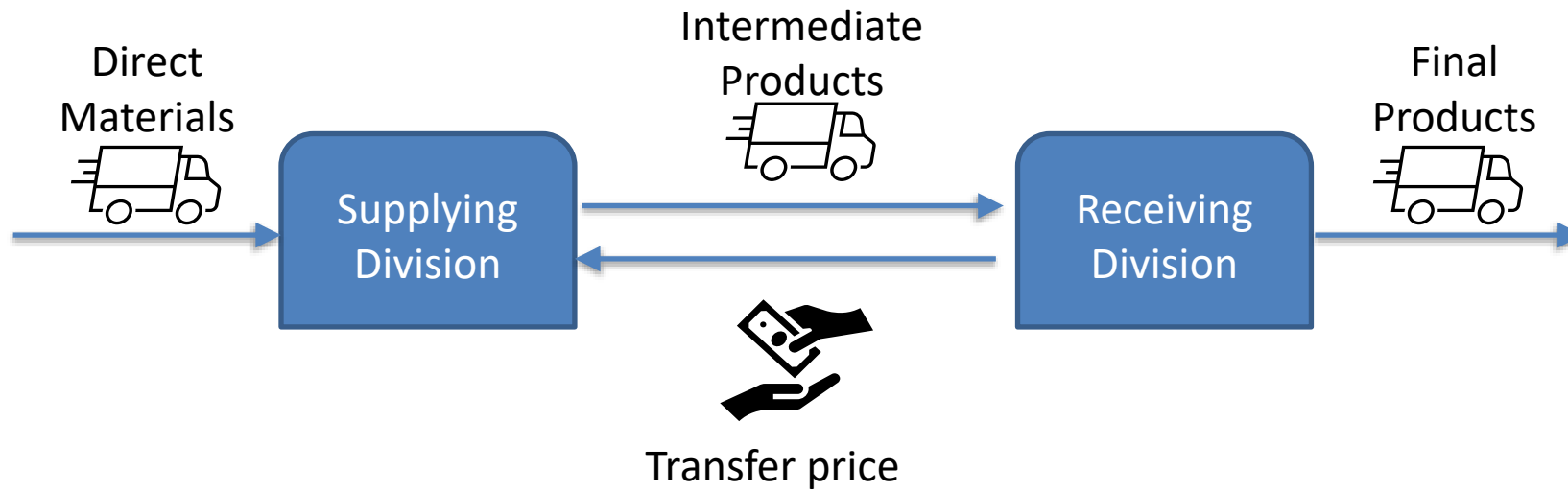


References

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Transfer pricing system

- The established transfer price is a cost to the receiving division and revenue to the supplying division. Whatever transfer price is set will affect the profitability of each division.
- Transfer price will also significantly influence each division's input and output decisions, and thus total company profits.



Transfer pricing system

- A transfer pricing system can be used to meet the following purposes:
 - To provide information that motivates divisional managers to make good economic decisions. This will happen when actions that divisional managers take to improve the reported profit of their divisions also improves the profit of the company as a whole.
 - To provide information that is useful for evaluating the managerial and economic performance of the divisions.
 - To ensure that divisional autonomy is not undermined.
 - To intentionally move profits between divisions or locations.

Transfer pricing system

- The management accounting literature identifies many different types of transfer prices that companies can use to transfer goods and services.
- The most notable ones are:
 - Market-based transfer prices.
 - Cost plus a profit mark-up transfer prices.
 - Marginal/variable cost transfer prices.
 - Full cost transfer prices.
 - Negotiated transfer prices.
 - Marginal/variable cost-plus opportunity cost transfer prices.

Transfer pricing system: surveys

UK survey (Abu-Serdaneh, 2004)

A survey based on responses from 170 companies reported the percentage of companies that used particular transfer pricing methods to a considerable extent. The percentage usage was as follows:

	%	%
Prevailing market price	16	
Adjusted market price	<u>15</u>	31
Unit full manufacturing cost	24	
Unit full manufacturing cost plus a profit margin	<u>38</u>	62
Unit variable manufacturing cost	2	
Unit variable manufacturing cost plus a profit margin	6	
Unit variable manufacturing cost plus a fixed fee	<u>1</u>	9
Negotiated transfer price		8

The findings indicated that a minority of companies used more than one transfer price.

Transfer pricing system: surveys

USA Survey (Borkowski, 1990)

Number of companies participating 215
Percentage using transfer prices 89.6%

Percentage using transfers on following bases

Market price

Full market price	20.2	
Adjusted market price	<u>12.5</u>	32.7

Negotiated

To external price	13.6	
To manufacturing costs	3.0	
With no restrictions	<u>6.0</u>	22.6

Full cost

Standard	14.3	
Actual	7.1	
Plus profit based on cost	14.9	
Plus fixed profit	2.4	
Other	<u>2.4</u>	41.1

Variable cost

Standard	2.4	
Actual	0.6	
Plus contribution based on cost	<u>0.6</u>	3.6

Total		<u>100.0</u>
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Market-based transfer prices

- If a perfectly competitive market for an intermediate product exists, it is optimal for both decision-making and performance evaluation purposes to set transfer prices at competitive market prices.
 - A perfectly competitive market exists where the product is homogeneous and no individual buyer or seller can affect the market prices.
- When transfers are recorded at market prices, divisional performance is more likely to represent the real economic contribution of the division to total company profits.
 - If the supplying division did not exist, the intermediate product would have to be purchased on the outside market at the current market price.
 - If the receiving division did not exist, the intermediate product would have to be sold on the outside market at the current market price.
- Divisional profits are therefore likely to be similar to the profits that would be calculated if the divisions were separate organizations.

Cost plus a mark-up transfer price

- Transactions between divisions are made on a transfer price that equals cost (of supplying division) plus a mark-up. It could lead to suboptimal solutions for the group.
- See the following example:

The Oslo division and the Bergen division are divisions within the Baltic Group. One of the products manufactured by the Oslo division is an intermediate product for which there is no external market. This intermediate product is transferred to the Bergen division where it is converted into a final product for sale on the external market. One unit of the intermediate product is used in the production of the final product. The expected units of the final product which the Bergen division estimates it can sell at various selling prices are as follows:

<i>Net selling price</i> (£)	<i>Quantity sold</i> (units)
100	1000
90	2000
80	3000
70	4000
60	5000
50	6000

The costs of each division are as follows:

(£)	<i>Oslo</i> (£)	<i>Bergen</i> (£)
Variable cost per unit	11	7
Fixed costs attributable to the products	60 000	90 000

Cost plus a mark-up transfer price

The costs of each division are as follows:

(£)	Oslo (£)	Bergen (£)
Variable cost per unit	11	7
Fixed costs attributable to the products	60 000	90 000

Total unit variable cost = $11 + 7 = 18$

Total fixed cost =
 $60\ 000 + 90\ 000 = 150\ 000$

Whole company profit computations

Output level (units)	Total revenues	Company variable costs	Company fixed costs	Company profit/(loss)
1000	100 000	18 000	150 000	(68 000)
2000	180 000	36 000	150 000	(6 000)
3000	240 000	54 000	150 000	36 000
4000	280 000	72 000	150 000	58 000
5000	300 000	90 000	150 000	60 000
6000	300 000	108 000	150 000	42 000

Maximum Profit

Cost plus a mark-up transfer price

Let us assume that £35 per unit (or £35 000 per 1000 units) is the full cost plus a mark-up transfer price. At this transfer price the profit computations for each division will be as follows:

Oslo division (Supplying division)

Output level (units)	Transfer price revenues	Variable costs	Fixed costs	Total profit/(loss)
1000	35 000	11 000	60 000	(36 000)
2000	70 000	22 000	60 000	(12 000)
3000	105 000	33 000	60 000	12 000
4000	140 000	44 000	60 000	36 000
5000	175 000	55 000	60 000	60 000
6000	210 000	66 000	60 000	84 000

Neither division will be motivated to operate at the optimal output level for the company as a whole of 5000 units.

Divisional Maximum Profit

Bergen division (Receiving divisions)

Output level (units)	Total revenues	Variable costs	Total cost of transfers	Fixed costs	Total profit/ (loss)
1000	100 000	7 000	35 000	90 000	(32 000)
2000	180 000	14 000	70 000	90 000	6 000
3000	240 000	21 000	105 000	90 000	24 000
4000	280 000	28 000	140 000	90 000	22 000
5000	300 000	35 000	175 000	90 000	0
6000	300 000	42 000	210 000	90 000	(42 000)

Divisional Maximum Profit

Marginal/variable cost transfer prices

- Marginal cost is a term that is used by economists. It refers to the additional cost of one extra unit of output. Accountants generally assume that marginal cost is the same as variable cost.
- When the market for the intermediate product is imperfect or non-existent, transfer prices set at the **variable/marginal cost** of the supplying division can motivate both the supplying and receiving division managers to operate at output levels that will **maximize overall company profits**.
- Setting the transfer price at the unit variable cost of the supplying division will motivate the divisional managers to operate at the optimum output level for the company as a whole, provided that the supplying division manager is instructed to meet the demand of the receiving division at this transfer price.
- Although the variable cost transfer price encourages overall company optimality it is a poor measure of divisional performance.

Marginal/variable cost transfer prices

- Refer to previous example of Baltic Group (Oslo and Bergen divisions)

The costs of each division are as follows:

(£)	Oslo (£)	Bergen (£)
Variable cost per unit	11	7
Fixed costs attributable to the products	60 000	90 000

- At a variable cost transfer price of £11 per unit the profit computations for each division will be as follows:

Oslo division (Supplying division)

<i>Output level (units)</i>	<i>Transfer price revenues</i>	<i>Variable costs</i>	<i>Fixed costs</i>	<i>Total profit/ (loss)</i>
1000	11 000	11 000	60 000	(60 000)
2000	22 000	22 000	60 000	(60 000)
3000	33 000	33 000	60 000	(60 000)
4000	44 000	44 000	60 000	(60 000)
5000	55 000	55 000	60 000	(60 000)
6000	66 000	66 000	60 000	(60 000)

Marginal/variable cost transfer prices

Bergen division (Receiving division)

<i>Output level (units)</i>	<i>Total revenues</i>	<i>Variable costs</i>	<i>Total cost of transfers</i>	<i>Fixed costs</i>	<i>Total profit/ (loss)</i>
1000	100 000	7 000	11 000	90 000	(8 000)
2000	180 000	14 000	22 000	90 000	54 000
3000	240 000	21 000	33 000	90 000	96 000
4000	280 000	28 000	44 000	90 000	118 000
5000	300 000	35 000	55 000	90 000	120 000
6000	300 000	42 000	66 000	90 000	102 000

Divisional Maximum Profit

- The supplying division reports a loss equal to £60 000 (=fixed costs) at all output levels (In the short-term fixed costs are unavoidable).
- In contrast, the receiving division (Bergen) maximizes its profits at the optimal output level of 5000 units with a reported profit of £120 000.
- The variable cost transfer price motivates managers to choose the optimal output level for the company as a whole but it results in a poor measure of divisional performance since the allocation of the £60 000 profits from inter-divisional profits results in the supplying division reporting a loss of £60 000 and the receiving division reporting a profit of £120 000.

Full cost transfer prices without a mark-up

- Let us assume that the 5000 units optimal output level for the company as a whole is used to determine the fixed cost per unit.
- The fixed cost per unit for the intermediate product will be £12 per unit (£60 000 fixed costs/5000 units) giving a full cost of £23 (£11 variable cost plus £12 fixed cost). If the transfer price is set at £23 per unit (i.e., £23 000 per 1000 batch) the receiving division manager will expand output as long as net marginal revenue exceeds the transfer price.
- How many units of product will Bergen division (receiving division) purchase?
- Recall some information:

<i>Net selling price (£)</i>	<i>Quantity sold (units)</i>	<i>Units</i>	<i>Net marginal revenue (£)</i>
100	1000	1000	93 000 (100 000 – 7000)
90	2000	2000	73 000 (80 000 – 7000)
80	3000	3000	53 000 (60 000 – 7000)
70	4000	4000	33 000 (40 000 – 7000)
60	5000	5000	13 000 (20 000 – 7000)
50	6000	6000	-7 000 (0 – 7000)



$$\text{Net marginal revenue} = \text{Price} \times \text{Quantity} - \text{Per Unit Variable Cost } (=7) \times \text{Quantity}$$

Full cost transfer prices without a mark-up

Net selling price (£)	Quantity sold (units)
100	1000
90	2000
80	3000
70	4000
60	5000
50	6000



Units	Net marginal revenue (£)
1000	93 000 (100 000 – 7000)
2000	73 000 (80 000 – 7000)
3000	53 000 (60 000 – 7000)
4000	33 000 (40 000 – 7000)
5000	13 000 (20 000 – 7000)
6000	-7 000 (0 – 7000)

Net marginal revenue \geq Transfer cost

- For each one thousand units increment in output up to 4000 units, net marginal revenue exceeds the transfer cost of £23 000 per thousand-unit batch.
- The manager will choose not to expand output to the 5000 units optimal level for the company as a whole because the transfer cost of £23 000 exceeds the net marginal revenue of £13 000.
- The transfer price is suitable for neither performance evaluation nor ensuring that optimal output decisions are made.

Negotiated transfer prices

- The difficulties encountered in establishing a sound system of transfer pricing have led to suggestions that negotiated transfer prices should be used.
- Negotiated transfer prices are most appropriate in situations where some market imperfections exist for the intermediate product, such as where there are several different market prices.
- When there are such imperfections in the market, the respective divisional managers must have the freedom to buy and sell outside the company to enable them to engage in a bargaining process. It is claimed that if this is the case then the friction and bad feeling that may arise from a centrally controlled market transfer price will be eliminated without incurring a misallocation of resources

Negotiated transfer prices

- For negotiation to work effectively it is important that managers have equal bargaining power.
- Unequal bargaining power:
 - If the receiving division has many sourcing possibilities for the intermediate product or service, but the supplying division has limited outlets.
 - If the transfers are a relatively small proportion of the business for one of the divisions and a relatively large proportion of the business of the other.
- A further difficulty with negotiation is that it is time-consuming for the managers concerned, particularly where a large number of transactions are involved.

Marginal/variable cost-plus opportunity cost transfer prices

- Setting transfer prices at the marginal/variable cost of the supplying division per unit transferred plus the opportunity cost per unit of the supplying division is often cited as a general rule that should lead to optimum decisions for the company as a whole.
- Opportunity cost is defined as the contribution foregone by the supplying division from transferring internally the intermediate product. This rule will result in the transfer price being set at the variable cost per unit when there is no market for the intermediate product.
- If the facilities are dedicated to the production of the intermediate product they will have no alternative use, so the opportunity cost will be zero.
- Consider now a situation where there is a perfectly competitive external market for the intermediate product.
 - Assume that the market price for the intermediate product is £20 per unit and the variable cost per unit of output is £5. If the supplying division has no spare capacity the contribution foregone from transferring the intermediate product is £15. Adding this to the variable cost per unit will result in the transfer price being set at the market price of £20 per unit.
 - What is the transfer price if the supplying division has temporary spare capacity? In this situation there will be no foregone contribution and the transfer price will be set at the variable cost per unit of £5.

Marginal/variable cost-plus opportunity cost transfer prices

- You should have noted that applying the above general rule leads to the same transfer price as was recommended earlier in this chapter. In other words, if there is a perfectly competitive external market for the intermediate product, the market price is the optimal transfer price. When there is no market for the intermediate product, transfers should be made at the variable cost per unit of output of the intermediate product. Thus, the general rule is merely a restatement of the principles that have been established earlier. The major problem with this general rule is that it is difficult to apply in more complex situations such as when there is an imperfect market for the intermediate product.

Exercise 18.13

Gustavsson AB, manufacturer of tractors and other heavy farm equipment, is organised along decentralised lines, with each manufacturing division operating as a separate profit centre. Each divisional manager has been delegated full authority on all decisions involving the sale of that division's output both to outsiders and to other divisions of Gustavsson. Division C has in the past always purchased its requirement of a particular tractor-engine component from Division A. However, when informed that Division A is increasing its selling price to € 150, Division C's manager decides to purchase the engine component from outside suppliers.

Division C can purchase the component for € 135 on the open market. Division A insists that, because of the recent installation of some highly specialised equipment and the resulting high depreciation charges, it will not be able to earn an adequate return on its investment unless it raises its price. Division A's manager appeals to top management of Gustavsson for support in the dispute with Division C and supplies the following operating data:

C's annual purchases of tractor-engine component	1000 units
A's variable costs per unit of tractor-engine component	€ 120
A's fixed costs per unit of tractor-engine component	€ 20

Exercise 18.13

Required:

1. Assume that there are no alternative uses for internal facilities. Determine whether the company as a whole will benefit if Division C purchases the component from outside suppliers for € 135 per unit.
2. Assume that internal facilities of Division A would not otherwise be idle. By not producing the 1000 units for Division C, Division A's equipment and other facilities would be used for other production operations that would result in annual cash-operating savings of € 18000. Should Division C purchase from outside suppliers?
3. Assume that there are no alternative uses for Division A's internal facilities and that the price from outsiders drops € 20. Should Division C purchase from outside suppliers?
4. Assume that Division A can sell the 1000 units to other customers at € 155 per unit with variable marketing costs of € 5 per unit. Determine whether Gustavsson will benefit if Division C purchases the 1000 components from outside suppliers at € 135 per unit.

Exercise 18.13

Suggested solution:

1.

The company as a whole will not benefit if Division C buys on the outside market.

Purchase costs from outsider, 1,000 units x € 135	€ 135,000
Deduct: Savings in variable costs by reducing Division A output, 1,000 units X € 120	€ <u>120,000</u>
Net cost (benefit) to company as a whole by buying from outside	<u>€ 15,000</u>

2.

The company will benefit if C purchases from the outside supplier:

Purchase costs from outsider, 1,000 units x € 135		€ 135,000
Deduct: Savings in variable costs, 1,000 units x € 120	€ 120,000	
Savings due to A's equipment and facilities being assigned to other operations	€ 18,000	<u>€ 138,000</u>
Net cost (benefit) to company as a whole by buying from outside		<u>€ (3,000)</u>

Exercise 18.13

Suggested solution:

3

The company will benefit if C purchases from the outside supplier:

Purchase costs from outsider, 1,000 units × € 115	€ 115,000
Deduct: Savings in variable costs by reducing Division A output, 1,000 units × € 120	120,000
Net cost (benefit) to company as a whole by buying from outside	€ (5,000)

⊕ The three requirements are summarised below (in thousands):

	(1)	(2)	(3)
Total purchase costs from outsider	<u>€ 135</u>	<u>€ 135</u>	<u>€ 115</u>
Total relevant costs if purchased from Division A			
Total incremental (outlay) costs if purchased from A	120	120	120
Total opportunity costs if purchased from A	<u>–</u>	<u>18</u>	<u>–</u>
Total relevant costs if purchased from A	<u>120</u>	<u>138</u>	<u>120</u>
Operating income advantage (disadvantage) to company as a whole by buying from A	<u>€ 15</u>	<u>€ (3)</u>	<u>€ (5)</u>

Goal congruence would be achieved if the transfer price is set equal to the total relevant costs of purchasing from Division A.

Exercise 18.13

Suggested solution:

4.

The company would benefit in this situation if C purchased from outside suppliers. The € 15,000 disadvantage to the company by purchasing from the outside supplier would be more than offset by the € 30,000 contribution margin of A's sale of 1,000 units to other customers.

Purchase costs from outside supplier, 1,000 units × € 135	€ 135,000
Deduct variable cost savings, 1,000 units × € 120	<u>€ 120,000</u>
Net cost to company <u>as a whole by</u> buying from outside	€ <u>€ 15,000</u>

A's sales to other customers, 1,000 units × € 155	€ 155,000
Deduct:	
Variable manufacturing costs, € 120 × 1,000 units	€ 120,000
Variable marketing costs, € 5 × 1,000 units	€ <u>5,000</u>
Variable costs	<u>€ 125,000</u>
Contribution margin from A selling to other customers	€ <u>30,000</u>

Exercise 18.15

The Leipzig Division of Bohemia Industries makes two component parts, X23 and Y99. It supplies X23 to the Hanover Division to be used in the manufacture of car engines and supplies Y99 to the Bremen Division to be used in the manufacture of car gearboxes. The Leipzig Division is the only supplier of these specialised components. When transfers are made in-house, Bohemia Industries transfers products at full cost (calculated using an activity-based cost system) plus 10%. The unit cost information for X23 and Y99 is as follows:

	X23	Y99
Variable costs per unit	€ 11	€ 8
Allocated fixed costs per unit	€ 14	€ 7

The Hanover Division feels that the price for X23 is too high and has told Leipzig that it is trying to locate an outside vendor to supply the part at a lower price. Wilhelm von Kalkstein, Leipzig Division's management accountant, calls Eberhard Dunkelmann, his assistant, into his office. 'We can't afford to lose the Hanover Division business. Our fixed costs won't go away even if we stop supplying Hanover, and this means that the costs of supplying Y99 to Bremen will increase. Then they'll start wanting to buy from outside. We're seriously looking at possibly shutting down the entire division if we lose the Hanover business. See if you can find a different method of allocating fixed costs that will decrease X23's transfer price to € 23.65. I think Bremen will be willing to pay a somewhat higher price for Y99.'

Exercise 18.15

Eberhard is uncomfortable making any changes because he knows that any other allocation method would violate corporate guidelines on overhead cost allocation. Still, he believes that changing the fixed-cost allocations is in the best interest of Bohemia Industries. Eberhard is confused about what he should do.

Required:

1. Calculate the transfer prices for X23 and Y99.
2. Calculate the fixed cost per unit that Eberhard would have to allocate to X23 to enable Leipzig to transfer X23 at € 23.65 per unit.

Exercise 18.15

Suggested solution:

1

Transfer prices for X23 and Y99 follow:

	X23	Y99
Variable costs per unit	€ 11.00	€ 8.00
Allocated fixed costs per unit	€ 14.00	€ 7.00
Full costs per unit	€ 25.00	€ 15.00
10% of full costs per unit	€ 2.50	€ 1.50
Transfer price per unit	€ 27.50	€ 16.50

2

For X23 to have a transfer price of € 23.65 per unit, its full cost would have to be $€ 23.65 + 1.10 = € 21.50$, because the transfer price per unit is determined by adding 10% to the full costs per unit.

Full costs per unit of X23	€ 21.50
Add 10% of full costs per unit	€ 2.15
Transfer price per unit	€ 23.65

Fixed costs per unit that Eberhard would have to allocate to X23 can be calculated as follows:

Full costs per unit of X23	€ 21.50
Deduct variable costs per unit	€ 11.00
Fixed costs per unit to be allocated	€ 10.50

Exercise 18.16

Ilmajoki-Lumber Oy has a Raw Lumber Division and Finished Lumber Division. The variable costs are:

- o Raw Lumber Division: € 100 per 100 board-metres of raw lumber.
- o Finished Lumber Division: € 125 per 100 board-metres of finished lumber.

Assume that there is no waste incurred in processing raw lumber into finished lumber. Raw lumber can be sold at € 200 per 100 board-metres. Finished lumber can be sold at € 275 per 100 board-metres.

Required:

1. Should Ilmajoki-Lumber process raw lumber into its finished form?
2. Assume that internal transfers are made at 110% of variable costs. Will each division maximise its contribution to divisional operating profit by adopting the action that is in the best interests of Ilmajoki-Lumber?
3. Assume that internal transfers are made at market prices. Will each division maximise its contribution to divisional operating profit by adopting the action that is in the best interests of Ilmajoki-Lumber?

Exercise 18.16

Suggested solution:

1

Alternative 1: Sell as raw lumber for € 200 per 100 board-metres:

Revenue	€ 200
Variable costs	<u>€ 100</u>
Contribution margin	<u>€ 100</u>

Alternative 2: Sell as finished lumber for € 275 per 100 board-metres:

Revenue	€ 275
Variable costs:	
Raw lumber	€ 100
Finished lumber	<u>€ 125</u>
Contribution margin	<u>€ 50</u>

Ilmajoki Lumber will maximise its total contribution margin by selling lumber in its raw form. An alternative approach is to examine the incremental revenues and incremental costs in the Finished Lumber Division:

Incremental revenues, € 275 – € 200	€ 75
Incremental costs	<u>€ 125</u>
Incremental loss	<u>€ (50)</u>

Exercise 18.16

2

Transfer price at 110% of variable costs:

$$= € 100 + (€ 100 \times 0.10)$$

$$= € 110 \text{ per } 100 \text{ board-metres}$$

Suggested solution:

	<u>Sell as raw lumber</u>	<u>Sell as finished lumber</u>
Raw Lumber Division		
Division revenues	€ 200	€ 110
Division variable costs	<u>€ 100</u>	<u>€ 100</u>
Division operating income	<u>€ 100</u>	<u>€ 10</u>
Finished Lumber Division		
Division revenues	€ 0	€ 275
Transferred-in costs	–	€ 110
Division variable costs	<u>–</u>	<u>€ 125</u>
Division operating income	<u>€ 0</u>	<u>€ 40</u>

The Raw Lumber Division will maximise reported divisional operating income by selling raw lumber, which is the action preferred by the company as a whole. The Finished Lumber Division will maximise divisional operating income by selling finished lumber, which is contrary to the action preferred by the company as a whole.

Exercise 18.16

Suggested solution:

3

Transfer price at market price = € 200 per 100 board-metres.

	Sell as raw lumber	Sell as finished lumber
<u>Raw Lumber Division</u>		
Division revenues	€ 200	€ 200
Division variable costs	€ <u>100</u>	€ <u>100</u>
Division operating income	€ <u>100</u>	€ <u>100</u>
Finished Lumber Division		
Division revenues	€ 0	€ 275
Transferred-in costs	–	€ 200 ←
Division variable costs	–	€ <u>125</u>
Division operating income	€ <u>0</u>	€ <u>(50)</u>

The Raw Lumber Division will maximise divisional operating income by selling raw lumber, which is the action preferred by the company. The Finished Lumber Division will maximise divisional operating income by not further processing raw lumber, which is preferred by the company as a whole.

Exercise 18.21 Question from the Chartered Institute of Management Accountants, Intermediate Level, Management Accounting - Decision Making

P Ltd has two divisions, Q and R, that operate as profit centres. Division Q has recently been set up to provide a component (Comp1) which division R uses to produce its product (ProdX). Prior to division Q being established, division R purchased the component on the external market at a price of £160 per unit. Division Q has an external market for Comp1 and also transfers to division R. Division R uses one unit of Comp1 to produce ProdX which is sold externally. There are no other products produced and sold by the divisions.

Costs associated with the production of Comp1 and ProdX are as follows:

	Comp1	ProdX
Fixed costs	£50000 per annum	£100 000 per annum
Variable costs		£250 per unit*
Direct labour	£15 per hour	
Materials	£25 per unit	
Variable overheads	£3 per labour-hour	
*The variable cost for ProdX excludes the cost of the component.		

Exercise 18.21

The first unit of Compl will take 20 labour-hours to produce. However, it is known that the work of direct labour is subject to a 90% learning curve. The forecast external annual sales and capacity levels for the divisions are as follows:

External sales		
Division Q	Compl	5000 units at a price of £150 per unit
Division R	ProdX	10000 units at a price of £500 per unit
Production capacity		
Division Q	Compl	13 000 units
Division R	ProdX	15 000 units

Required:

1. State, with reasons, the volume of Comp1 which division Q would choose to produce in the first year and calculate the marginal cost per unit of Comp1 at this volume.
2. Explain the criteria an effective system of transfer pricing should satisfy.
3. Discuss one context in which a transfer price based on marginal cost would be appropriate and describe any issues that may arise from such a transfer pricing policy.
4. Identify the minimum transfer price that division Q would wish to charge and the maximum transfer price which division R would want to pay for the Comp1. Discuss the implications for the divisions and for the group as a whole of the transfer prices that you have identified.

Exercise 18.21

Suggested solution:

1

If its objective is to maximise the profit of its division, then division Q will wish to maximise the number of Comp1s it sells at the best possible price, while satisfying both its external (5000 units) and internal market (8000 units). The marginal cost for producing 13,000 Comp1s is shown below:

	£	£
Materials	25×13000	325,000
Labour	$15 \times 61,620(W1)^*$	924,300
Overheads	$3 \times 61,620$	184,860
Total marginal cost		1,434,160
Units produced		13,000
Marginal cost per unit		110

*Working 1

$$Y = ax^b$$

$$Y = (20) (13,000 \text{ to the power of the log of the learning curve rate/log of } 2)$$

$$Y = (20) (13,000^{0.152})$$

$$Y = 4.74 \text{ hours per unit}$$

$$\text{Total labour hours } 13,000 \text{ units} \times 4.74 \text{ hours per unit} = 61,620$$

Exercise 18.21

Suggested solution:

2

An effective transfer-pricing system should conform to the following criteria.

Enable divisional and managerial performance measurement

The verdict on divisional managers is predominantly determined by their divisions' performance. In order for it to serve as a reasonable indicator of managerial performance, transfer-pricing system is required to be *robust*.

Promote goal congruence

As divisional managers are judged on their divisions' performance, it is in their interest to seek the best transfer price for their division. Consequently, a transfer-pricing system is sought which is favourable for each division as well as the company as a whole.

Maintain divisional autonomy

The right to set their divisional transfer price without the interference of head office will ensure that managers aren't undermined and de-motivated and made to feel they have no control over their divisional performance. There is little point in granting autonomy to divisions if they are not free to set their transfer price.

Record transfers between divisions

A practical application of transfer pricing is to aid in recording the transfer of goods and services between divisions.

Minimise the global tax liability

In multinational companies, the transfer-pricing system can assist in transferring profits around the globe and therefore minimise the global tax liability.

Exercise 18.21

Suggested solution:

3

Imperfect or non-existent markets for the intermediate product means that the marginal cost transfer prices can motivate both the supplying and receiving division managers to operate at output levels that will maximise over all company profits. Therefore, the correct transfer price to encourage optimum profits for the company as a whole (assuming there are no production constraints) is the marginal production cost of the intermediate product. However, if the transfer price for the intermediate product is set at marginal cost, the supplying division will be seen to under-perform and will report losses on the interdivisional transfers because of the total production costs having been deducted from a transfer price based on marginal cost. Obviously, the supplying division in this instance will not be happy with this transfer price, but of course the receiving division will be. The receiving division will obtain the intermediate product at marginal cost and therefore, all of the profit from the final output will be reported in its division.

Exercise 18.21

Suggested solution:

4

The minimum transfer price that division Q would wish to charge would be equal to the external market price, that is, £150 per unit. Division Q's objective will be to charge as high a transfer price as possible and division R's objective will be to pay as little as possible for the components. Clearly, division R would wish to buy from division Q if the transfer price is less than £160 per unit.

If division Q sets a transfer price equal to £160 per unit, then division R will be indifferent as to whether it purchases internally or externally. However, from a group point of view, profit will be maximised from utilising the spare capacity within division Q and not purchasing the components from the external market. Therefore, agreement will need to be reached between division Q and division R and a transfer price negotiated, which is less than £160 per unit.

Agreement on the transfer price of Comp1 will depend on the strength of the managers' negotiation skills and whether or not equal bargaining power exists for the divisional managers.

Proposals for resolving transfer pricing conflicts

- In the absence of a perfect market for the intermediate product none of the transfer pricing methods can perfectly meet both the decision-making and performance evaluation requirements and also not undermine divisional autonomy.
- If (a) the external market for the intermediate product does not approximate closely those of perfect competition and (b) long-run marginal cost can be accurately estimated, transfers at marginal cost should motivate decisions that are optimal from the overall company's perspective.
- **BUT** transfers at marginal cost are unsuitable for performance evaluation since they do not provide an incentive for the supplying division to transfer goods and services internally **because** they do not contain a profit margin for the supplying division.
- Transferring at cost plus a mark-up creates the opposite conflict **because** the transfer price meets the performance evaluation requirement but will not induce managers to make optimal decisions.
- To resolve the above conflicts the following transfer pricing methods have been suggested:
 - Adopt a dual-rate transfer pricing system;
 - Transfer at a marginal cost plus a fixed lump-sum fee.

Dual-rate transfer pricing system

- Dual-rate transfer prices are not widely used in practice for several reasons:
 - The use of different transfer prices causes confusion
 - They are considered to be artificial.
 - They reduce divisional incentives to compete effectively. For example, the supplying division can easily generate internal sales to the receiving divisions when they are charged at variable cost. This protects them from competition and gives them little incentive to improve their productivity.
 - Top-level managers do not like to double count internal profits because this can result in misleading information and create a false impression of divisional profits.

Two-part transfer pricing system

- A solution that has been proposed where the market for the intermediate product is imperfect or non-existent, and where the supplying division has no capacity constraints is a two-part transfer pricing system:
- Transfer price = variable cost per unit of output + (a fixed fee)
- With this system, the receiving division acquires additional units of the intermediate product at the variable cost of production.
- The receiving division acquires the quantity of the intermediate product which equates its marginal (variable) costs with its net marginal revenues to determine the optimum profit-maximizing output level.
- The supplying division can recover its fixed costs and earn a profit on the inter-divisional transfers through the fixed fee charged each period. The fixed fee is intended to compensate the supplying division for tying up some of its fixed capacity for providing products or services that are transferred internally. The fixed fee should cover a share of fixed costs of the supplying division and also provide a return on capital.

International transfer pricing

- International transfer pricing is concerned with the prices that an organization uses to transfer products between divisions in different countries.
- The rise of multinational organizations introduces additional issues that must be considered when setting transfer prices.
- When the supplying and the receiving divisions are located in different countries with different taxation rates, and the taxation rates in one country are much lower than those in the other, it would be in the company's interest if most of the profits were allocated to the division operating in the low taxation country.
- Taxation authorities in each country are aware that companies can use the transfer pricing system to manipulate the taxable profits that are declared in different countries and investigate the transfer pricing mechanisms of companies to ensure that they are not using the transfer pricing system to avoid paying local taxes.

International transfer pricing

- Economic Co-operation and Development issued a guideline statement in 1995 (OECD, Paris, 1995): the taxation authorities in most countries have used it as the basis for regulating transfer pricing behaviour of international intra-firm transactions.
- The OECD guidelines are based on the arm's-length price principle which relates to the price that would have resulted if the prices actually used had been between two unrelated parties.
- The arm's-length principle can be implemented using one of the following methods: (1) the comparable uncontrolled price method (which uses externally verified prices of similar transactions involving unrelated parties); (2) the resale price method (which deducts a percentage from the selling price from the final product to allow for profit); (3) the cost-plus method.

International transfer pricing – Google uses 'Dutch sandwich' to save billions in taxes

Global search engine provider Google managed to keep its effective tax rate overseas at a low 2.4 per cent in 2009. The company had a transfer pricing arrangement approved by the US Internal Revenue Service in 2006. Under the arrangement, Google's operations in Dublin, Ireland, licenses its search and advertising technology to the US parent. The Irish corporate tax rate of 12.5 per cent compares favourably with other jurisdictions, but Google pays little tax in Ireland as its profits are shifted through the Netherlands to a Bermuda subsidiary. This process is referred to by tax experts as the 'Dutch Sandwich'. According to a Bloomberg news report (22 Oct., 2010), 99.8 per cent of revenues recorded in its Irish operations reach Bermuda. Most of the revenues come from European markets. In Bermuda, the corporate tax rate is zero, so Google avoids taxes on a large share of its profits. From 2007 to 2009,

Google's effective tax rate has been 2.4 per cent. This is a low effective tax rate considering a 28 per cent rate in the UK, the company's second largest market. Indeed most of the countries Google operates in have corporate tax rates above 20 per cent. According to the report Google is not alone in its efforts. Apple, Oracle, Microsoft and IBM reported tax rates between 4.5 percent and 25.8 percent on their overseas earnings from 2007 to 2009.

Questions

- 1 Considering the arm's-length principle, would it be easy to estimate a price for Google's licensing of its technologies?
- 2 Do you think the arrangements like those of Google are ethical, despite being legal?



References

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