# Transfer Pricing

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## Introduction

Transfer pricing is the set of mechanisms which is used to attach prices to goods or services which are traded between two divisions of the same company. The classic example involves one division (the "selling division", or "SD") which produces a component which is required by another division (the "buying division", or "BD"). The component is used by the BD in the manufacture of a product which it sells on the open market.

In case all of this sounds a bit abstract, let's consider a simple example of a company in which the SD manufactures car engines and the BD manufactures cars. A couple of things are obvious:

1. The BD needs the output of the SD, because the BD needs car engines in order to make cars. Alternatively, the BD may be able to buy engines from an external supplier if, for example, the BD and SD cannot agree on a transfer price for the engines.

2. The SD can sell its output either to the BD or to external customers (in this case, these external customers would be other car manufacturers, many of which would be only too happy to buy in a ready-made engine).

The transfer price represents a source of revenue to the SD, and a cost to the BD. Therefore, there is potential for inter-divisional conflict (or at least a need for inter-divisional negotiations) since the SD will want to maximize the transfer price while the BD will want to minimize it.

When we are preparing the Profit and Loss Account of the company as a whole, the transfer price is neither a cost nor a revenue. The transfer price is not taken into account in the calculation of *company* profit, since it is simply the price attaching to an intra-company transaction.

It is therefore reasonable to ask whether, from the company's point of view, it really matters what level the transfer price is set at. The answer is that it matters a great deal. If the "wrong" transfer price is set, then this creates incentives for divisions to act in ways which are detrimental to the best interests of the company as a whole. In other words, suboptimal transfer pricing destroys goal congruence. This will be illustrated by means of a series of linked examples in the next section.

To conclude this introductory section, it is useful to set out the main objectives of a transfer pricing system:

1. To achieve goal congruence. The transfer prices should be such that actions which will have the effect of increasing a *division's* reported profit will also have the effect of increasing the *company's* reported profit. This maximises the likelihood that the division managers will act in the company's best interests.

2. To ensure that divisional autonomy is maintained. In principle the top management of a company could simply issue precise instructions to divisions as to what goods to transfer to each other, in what quantities, and at what prices. This would seem to solve the problem of transfer pricing at a stroke, and to achieve optimization (for the company as a whole) by *diktat*. However, most organizations are unwilling to go down this road, because of the enormous benefits of allowing divisional autonomy. It would be very difficult to make division managers accountable for their profits if they were not given a free hand in making important decisions.

3. To ensure that the information provided (e.g., division Profit & Loss Accounts) is useful for evaluating the economic performance of divisions and the managerial performance of division managers.

## Transfer pricing scenarios

Drury (2004, p. 885) states that 'no single transfer price is likely to perfectly serve all of the [objectives of transfer pricing]'. This is true, but there is one fairly straightforward principle which can be used to identify optimal transfer prices in many cases. This principle is as follows:

> ***The transfer price should be equal to the marginal cost of producing the transferred product or service, plus the opportunity cost of making the transfer. (The opportunity cost arises because of the fact that if a product is transferred from the SD to the BD, then the SD loses the opportunity to earn some profit margin by selling the product to an external customer).***

The reasons for this principle, and its practical implications, will become clear as we review a series of four transfer pricing scenarios in this section. These examples are all based on a hypothetical company called Cristal Ltd. This company has a Molten Glass Division, and the following is a summary of that division's activities last year:

| Output & sales (*all to external customers*) | Selling price | Marginal cost (= variable cost) | Fixed costs |
|---|---|---|---|
| 40,000 tons | €120 per ton | €65 per ton | €720,000 per annum |

The company also has a Glass Bottles Division, which needs 10,000 tons of molten glass per annum in order to manufacture its bottles. At present, however, the Glass Bottles Division buys all of its molten glass from an external supplier at a price of €105 per ton.

Obviously, since the Molten Glass Division produces something which the Glass Bottles Division needs, the possibility of these two divisions doing some business with each other should at least be considered. Let's look at a number of possible scenarios.

**Scenario 1: No spare capacity in the Molten Glass Division**

This means that the Molten Glass Division cannot increase its output above the level of 40,000 tons per annum which it is already producing (and selling to external customers). Therefore, if any tons of molten glass are sold to the Glass Bottles Division, then there will have to be a corresponding reduction in the quantity sold to external customers. Applying the principle set out earlier, the Molten Glass Division will want to set the transfer price as follows:

- Marginal cost of producing molten glass = €65 per ton.

- Opportunity cost of making the transfer = lost contribution from foregoing the sale to the external customer = [€120 selling price - €65 marginal cost] = €55 per ton.

- Hence: Transfer price = [Marginal cost incurred up to the point of transfer] + [Opportunity cost of making the transfer] = €65 + €55 = €120 per ton.

The Molten Glass Division will not want to transfer their product for less than €120, since to do so would reduce the division's profits.

However, the Glass Bottles Division will not be willing to pay this price, or indeed any price higher than the €105 which they are currently paying to the external division. Therefore the two divisions will not be able to agree on a transfer price, and will not want to trade with each other.

We can show that this outcome is goal congruent (i.e., it is in the best interests of Cristal Ltd. as a whole) and that any other transfer price would be potentially detrimental to the company's best interests. Suppose, for example, that the Molten Glass Division were to match the price (€105) being offered by the Glass Bottles Division's external supplier. How would the divisions, and Cristal Ltd. as a whole, be affected?

- Glass Bottles Division: No change in profit (because it would still be paying the same price as before for molten glass, albeit to the Molten Glass Division rather than to the external supplier).

- Molten Glass Division: Reduction in sales revenue, and therefore reduction in profit, of [(€120 - €105) * 10,000 tons] = €150,000.

- Cristal Ltd.: Loss of revenue = (€120 * 10,000 tons = €1,200,000); Reduction in payments to external suppliers = (€105 * 10,000 tons = €1,050,000); Hence reduction in profit = (€1,200,000 - €1,050,000 = €150,000).

**Scenario 2: Spare capacity in the Molten Glass Division**

Assume now that the Molten Glass Division has the capacity to increase its output above the current level of 40,000 tons per annum, but that there is no demand from external customers for these potential additional tons. This means that it is now possible to produce some extra molten glass for sale to the Glass Bottles Division *without* any reduction in the quantity sold to external customers. In other words, where spare capacity exists, there is no opportunity cost associated with making the transfer. The minimum transfer price acceptable to the Molten Glass Division for units produced using spare capacity can be calculated as follows:

- Marginal cost of producing molten glass = €65 per ton.

- Opportunity cost of making the transfer = Nil.

- Hence: Transfer price = [Marginal cost incurred up to the point of transfer] + [Opportunity cost of making the transfer] = €65 + Nil = €65 per ton.

If molten glass produced using spare capacity is transferred to the Glass Bottles Division at any transfer price in excess of €65 per ton, then the Molten Glass Division's profits will increase by: [(Transfer price - €65) * Number of tons transferred].

Furthermore, if the Glass Bottles Division pays a transfer price of less than €105 per ton (i.e., the price currently charged by the external supplier), then the Glass Bottles Division's profits will increase by: [(€105 – Transfer price) * Number of tons transferred].

Therefore, so far as units which can be produced using spare capacity are concerned, a transfer price which is greater than €65 but less than €105 will result in increased profits for both divisions (compared with the profits which they would earn if they did not trade with each other). In line with the principle of divisional autonomy, it is appropriate to leave it to the two division managers to negotiate the precise transfer price within this range.

Goal congruence is also achieved. By using spare capacity, the company is producing molten glass at an incremental cost of €65 per ton instead of buying it from an external supplier at €105 per ton. Therefore, Cristal Ltd.'s profits are increased by: [(€105 - €65 = €40) * Number of tons produced using spare capacity].

**Scenario 3: LIMITED Spare capacity in the Molten Glass Division**

This is a variation on Scenario 2. Suppose, for example, that the maximum production capacity of the Molten Glass Division is 45,000 tons per annum. Since there is demand from external customers for 40,000 tons, this means that spare capacity is just 5,000 tons.

Remember that the Glass Bottles Division needs 10,000 tons per annum. Therefore, only half of its needs (5,000 tons) can be produced using spare capacity, and these transferred tons should be priced in accordance with Scenario 2.

If the Molten Glass Division were to also supply the Glass Bottles Division with the other half of its needs (i.e., another 5,000 tons) then it would have to reduce sales to external customers by a corresponding amount. Therefore these units should be priced in accordance with Scenario 1.

Hence in this situation it is optimal to have two transfer prices, i.e., a lower one for transfers which can be produced using spare capacity and a higher one for transfers which involve an opportunity cost because they involve foregoing sales to external customers.

It is important to resist the temptation in these circumstances to use an 'average' price for all transfers, because it is sure to be suboptimal. Suppose, for example, that the following situation had been arrived at:

- For units to be produced using spare capacity (Scenario 2), the divisions agreed on the 'midpoint' of the range of acceptable prices, i.e., (€65 + €105) / 2 = €85.

- As regards units which could not be produced using spare capacity, but would instead reduce the number of units available for sale to external customers, the division managers accepted (in accordance with the logic of Scenario 1) that the transfer price should be €120 (the price charged to external customers whom these transfers would displace).

So far, so good. The transfer pricing arrangement (involving the first 5,000 transfers being priced at €85 per ton, and any subsequent transfers at €120 per ton) is optimal for Cristal Ltd., in line with the logic of Scenarios 1 and 2. But suppose now that we decided to 'average' these two prices, to come up with a single transfer price which would apply to all transfers:

- Transfer price = (€85 + €120) / 2 = €102.50.

- It is easy to see that this transfer price is suboptimal. The Glass Bottles Division will want to buy all 10,000 tons of glass from the Molten Glass Division, since €102.50 is lower than the price (€105) which it is paying to its external supplier. But this is not optimal for Cristal Ltd. since (as we saw in Scenario 1)

optimization is achieved only if transfers which displace sales to external customers are priced at the price charged to external customers.

## Scenario 4: When negotiation fails

We saw in Scenario 2 that inter-divisional negotiations are likely to be needed in order to determine the transfer price which should apply to output produced using spare capacity. But this raises the question as to what should happen if the negotiations fail.

We have seen that the range of transfer prices which should be acceptable to both managers (for output produced using spare capacity) is €65 to €105. But suppose that each division tries to hold out for a transfer price very favourable to itself (e.g., the Molten Glass Division refuses to go below a transfer price of €100 and the Glass Bottles Division refuses to go above €70). Because there is no agreement on transfer price there will be no inter-divisional transfers, and the Glass Bottles Division will continue to buy all of its molten glass from the external supplier at €105 per ton. Since the company could have produced this molten glass for €65 per ton, this is clearly suboptimal for Cristal Ltd. as a whole.

When division managers cannot agree on a transfer price, should the company's top management intervene to order the divisions to make the transfer if (as in this case) it is obvious that the transfer would be in the company's best interests? The answer is no. There are two reasons for this:

1. For the reasons stated earlier, the preservation of divisional autonomy is an important principle which should not lightly be breached.

2. If the division managers are allowed to suffer the consequences of their own intransigence, then they are unlikely to make the same mistake in future. For example both managers will be aware that if they had 'split the difference' and agreed on a transfer price of €85 per ton, then they could each have earned an incremental profit of €20 per ton. By failing to agree a price, they have deprived themselves of this profit in the current period. They are likely to remember this lesson in future transfer pricing negotiations.

## Further coverage of transfer pricing methods

Both of the main prescribed texts for this course (Drury, 2004; Horngren, 2005) provide treatments of transfer pricing which are both more comprehensive and more theoretical than I have attempted to provide in this article. It is important that students should read the chapter on transfer pricing in one or other of these texts, but I hope that reading this article first will make reading the textbook a lot easier.

For example, Drury discusses five main methods of transfer pricing in considerable detail. However if students understand the basic principle of transfer pricing set out at the beginning of the previous section (i.e., that transfer price should be equal to the marginal cost of producing the transferred product or service plus the opportunity cost of making the transfer) and the four scenarios outlined above, then they already have a basic knowledge of the logic which underlies three of Drury's five methods (market-based transfer prices, marginal cost transfer prices, and negotiated transfer prices).

Drury's other two methods are full cost transfer prices and cost-plus-markup transfer prices. The mechanics of these methods are easily illustrated. Returning to the basic data given above in relation to the Molten Glass Division, the full cost per ton can be calculated as follows:

| Marginal cost per ton (= variable cost ton) | Fixed cost per ton | Full cost per ton |
|---|---|---|
| €65 | (€720,000 / 40,000 tons) = €18 | (€65 + €18) = €83 |

The full cost method involves using €83 as the transfer price per ton. The cost-plus-markup method involves using this full cost plus some profit markup. These methods often (but not always) cause suboptimisation. For example, if we consider Scenario 1 in the previous section, it is clear that the full cost transfer price (€83 per ton) would be too low where no spare capacity exists. However, in Scenario 2 (where spare capacity exists) it is clear that the full cost transfer price of €83 per ton would lead to optimal decision-making in these circumstances (and, in fact, would split the incremental profit reasonably equitably between the two divisions).

## Other issues in transfer pricing:

There are a couple of other issues which commonly arise in exam questions on transfer pricing:

1. Selling costs: Often there are selling costs which arise if goods are sold to an external customer but which are avoided if goods are transferred to another division within the company.

   This should be allowed for in determining the opportunity cost of making the transfer. For example in Scenario 1 above, we calculated the opportunity cost of transferring a ton of molten glass to the Glass Bottles Division (instead of selling it to an external customer) as €55 per ton. But suppose now that there is a sales commission of €3 per ton when molten glass is sold to an external customer, but no sales commission if goods are transferred to the Glass Bottles Division.

In these circumstances the opportunity cost of making the transfer is reduced to (€55 - €3 = €52). The optimal transfer price is reduced accordingly.

2. Strategic considerations: For strategic reasons a company may *require* its divisions to trade with each other even where external markets exist. For example a company such as Volkswagen may not wish its engines manufacturing division to sell its engines to rival car manufacturers, and may require that its car manufacturing division uses engines produced within the Volkswagen Group. In other words although external markets for engines exist, the company (for strategic reasons) the company does not wish the divisions to use them.

   Transfer pricing mechanisms which rely on external market prices (as in Scenario 1 above) clearly will not work in this situation. One solution is for the selling division (i.e., the engines manufacturing division in this example) to be paid the marginal cost for each engine (which is the optimal transfer price since there is no opportunity cost) plus a lump-sum fixed annual fee (to enable the division to cover its fixed costs and show a profit).

## References


Drury, C. (2004). *Management and cost accounting* (6th ed.). Thomson.

Horngren, C. T., Bhimani, A., Datar, S. M., & Foster, G. (2005). *Management and cost accounting* (3rd ed.). Prentice-Hall.