



Transfer Pricing and Opportunity Cost

by John Currie, on behalf of the CPA Examinations Team for Professional Level Performance Management, February 2023.

Large companies are often organised into profit centres (PCs). Typically, each PC has considerable operating autonomy and is permitted (and expected) to maximise its own profits. Often these PCs choose to trade with each other even where they are not obligated to do so. A question then arises as to what prices should apply to any transfers between PCs.

One basis for determining the transfer price is the opportunity cost associated with making the transfer. However, this approach to transfer pricing is not a magic bullet which will produce the best possible outcome in all circumstances. With transfer pricing (as with any business problem) we need to ask, “what solution will work in practice for this particular organisation”, not “what is the correct solution in a theoretical or abstract sense”. In particular, in any situation where a transfer price is required, we should ask these questions:

1. What the “opportunity cost transfer price” would be in the particular case.
2. What decisions the PC managers would be likely to take in response to the transfer price.
3. Whether those decisions by the PC managers would be “goal congruent” (i.e., consistent with the best interests of the company as a whole).
4. Whether any changes to the company’s business model are advisable in the long term.

Let’s apply this approach to a particular company, “Mikado Ltd.”

Example: Mikado Ltd.

- Mikado Ltd. consists of two profit centres. The company has made a significant capital investment in both profit centres and both of them operate at their full production capacity.
- Profit Centre 1 (PC1) manufactures 15,000 units of a component each year. 10,000 of these units are sold to external customers at a price of €1,200 each and the remaining 5,000 units are sold to Profit Centre 2 (PC2) at the same price. Production costs in PC1 are €6,000,000 per annum (fixed cost) plus €500 per unit of the component (variable cost).
- Each year PC2 manufactures 5,000 units of a product which it sells to consumers for €2,500 each. Fixed production costs in PC2 are €4,500,000 per annum. In the manufacture of one unit of its product PC2 uses one unit of the component from PC1 and incurs additional variable costs of €500.
- Some conflict has arisen between the two profit centres over the transfer price of the component. PC2 has asked for the €1,200 transfer price to be reduced. However, PC1 has refused, and has stated that (if PC2 does not wish to purchase its annual quota of 5,000 units per annum at the €1,200 price) then PC1’s existing customers would be happy to purchase these units at this €1,200 price. In response, PC2 has accused PC1 of taking unfair advantage of the fact that PC2 has no alternative source of supply for the component.

What is the opportunity cost transfer price in this case?

- The opportunity cost transfer price is €1,200, i.e., the existing transfer price.
- The reason for this is that (by transferring the 5,000 components to PC2) the opportunity for PC1 to sell those 5,000 components to its external customers for €1,200 each is lost.
- An important consideration here is that there is no spare capacity in PC1. It can transfer the 5,000 components to PC2 or it can sell them to its external customers, but it can't do both because its production capacity is fully utilised.

What decisions will PC1 take?

- PC1 will use its entire production capacity and thus manufacture 15,000 components. For each component manufactured PC1 receives €1,200 (from either PC2 or an external customer) and this comfortably exceeds the €500 variable cost, giving PC1 a contribution of (€1,200 - €500 = €700) on each unit of the component.
- PC1 will be indifferent as to whether it sells the component to PC2 or to an external customer, because in both cases the price received is the same (€1,200). Therefore, PC1 will supply the required 5,000 components to PC2 if the latter so wishes although PC1 has already pointed out that it could easily sell these components at the same price to an external customer

What decision will PC2 take?

- PC2 will purchase 5,000 units of the component despite its complaints about the transfer price. We know this because by doing so PC2 will earn a contribution on its product as follows:

Selling price received	€2,500
Less: transfer price paid	(€1,200)
Less: variable costs in PC2	(€500)
Contribution	€800

- PC2 has no alternative source of supply for the component. Therefore, if it refused to purchase the component from PC1 then PC2 could not make any units of its own product and would suffer a loss equal to its fixed costs. From PC2's perspective it is preferable to purchase the component from PC1 in order to earn some positive contribution which helps to pay (at least partly) its fixed costs.

Is goal congruence achieved?

- The manufacture of each unit of PC2's product results in a contribution for Mikado Ltd. of (€2,500 selling price - €500 variable cost of manufacturing the component in PC1 - €500 variable cost in PC2 = €1,500).
- As the manager of PC1 has pointed out, there is an alternative use for the 5,000 components which are at present transferred to PC2. This alternative is for PC1 to sell them to its external customers for €1,200 each. However, this would yield a profit to Mikado of only (€1,200 - €500 = €700) per component.
- Clearly €1,500 > €700 so it is in the interests of Mikado Ltd. that the 5,000 components should be transferred from PC1 to PC2 and then built into PC2's finished product. As shown above, this is exactly what the PC managers are likely to decide when acting in their own best interests. Thus, it can be said that the €1,200 transfer price leads to the achievement of a goal congruent outcome.

Are any changes to the company's business model advisable in the long term?

- We have seen above what is the optimal use of Mikado Ltd.'s existing production facilities. However, the company has made a substantial capital investment in both PCs and we cannot take it for granted that the continued existence of these production facilities is financially justified in the long term. For example, it may be the case that (in the long term) it would be possible (and financially preferable for Mikado Ltd.) to scale down some of the production facilities and achieve a reduction in fixed costs. Let's evaluate that possibility.
- First of all, let's determine whether Mikado is really making a profit on the annual production of 5,000 units of PC2's product:

Contribution from this production: 5,000 units @ €1,500 =	€7,500,000
Less: Fixed costs in PC2	€4,500,000
Less: Fixed costs in PC1 attributable to these units ¹ = (5,000 / 15,000) * €6,000,000	€2,000,000
Profit	€1,000,000

¹ Remember that PC1 produces 15,000 units of its component but that only 5,000 of these are transferred to PC2.

- So, it seems that this production is profitable for Mikado Ltd. even in the long term. However, let's see how much of this profit is attributed to each of the two profit centres, bearing in mind the €1,200 transfer price:

	PC1	PC2
Sales	5,000 units @ €1,200 transfer price = €6,000,000	5,000 units @ €2,500 = €12,500,000
Less: Transfer price PAID	Not applicable	5,000 units @ €1,200 transfer price = €6,000,000
Less: Variable costs	5,000 units @ €500 = €2,500,000	5,000 units @ €500 = €2,500,000
Less: Fixed costs attributable to this production	$(5,000 / 15,000) * €6,000,000 = €2,000,000$	€4,500,000
Profit (Loss)	Profit €1,500,000	(Loss €500,000)

- How are we to interpret this result, especially the €500,000 loss for PC2? The answer is that PC2 really is a loss-maker when we acknowledge that the continued operation of this profit centre involves both an opportunity cost and significant fixed costs:

Opportunity cost of the component (i.e., sales revenue foregone)	€1,200
Variable cost in PC2	€500
Fixed costs per unit of output in PC2	$€4,500,000 / 5,000 = €900$
Full cost of PC2's product, per unit	€2,600
Loss per unit of PC2 = Selling price minus full cost	$€2,500 - €2,600 = €100$
Total loss in PC2	$5,000 * €100 = €500,000$

- In the long-term (specifically, a timeframe within which fixed costs can be avoided, e.g., when leases of production facilities expire) it would be more profitable for Mikado Ltd. to discontinue PC2 completely and to have PC1 sell all 15,000 units of its component to external customers at the €1,200 price.
- PC2 has complained that the €1,200 transfer price is too high and is unfair. But this argument does not stand up to scrutiny for a number of reasons. First, €1,200 is the market value of the component and external customers are willing to pay it. A transfer price lower than this figure would represent a subsidy of PC2 at the expense of PC1. Second, the €1,200 transfer price has the beneficial effect that it results in the PC2 profit calculation revealing the loss-making nature of this part of Mikado Ltd.'s operations. Third, and as shown earlier, the €1,200 transfer price does not remove the incentive for PC2 to continue manufacturing its product in the short term and this is in Mikado Ltd.'s best interests.

Conclusion:

This example shows that (in this case at least) a transfer price based on opportunity cost can lead to very satisfactory outcomes for the company both in the short term and in the long term.

But it was stated at the outset that this type of transfer price does not always deliver the best outcome; it depends on the particular circumstances. For example, suppose that another profit centre ("PC3") manufactured a highly specialised component for which there was no external market and that the only possible use for the component was to sell it to PC2. In that case, since the transfer does not give rise to any external sale, the logic of an opportunity cost transfer price would mean that the specialised component would be transferred at a price equal to its variable cost of production. This would result in PC3 reporting a loss equal to its fixed costs. This would be very damaging to motivation in PC3 and would give the (presumably false) signal that the continued existence of PC3 was not financially justified.