

Study Notes

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Paper P2 Performance Management

In cases where one division of a company supplies another, cost-based transfer pricing is often used in order to measure each division's performance. But which system offers the fairest assessment?

By Grahame Steven FCMA
Accounting lecturer and teaching fellow at
Edinburgh Napier University

Before the early 20th century most businesses tended to have narrow product ranges, so their management accounting techniques were concerned mainly with efficiency. When companies such as DuPont started to expand what they produced in the 1920s, they needed new methods to track the performance of their increasingly diverse activities. DuPont's solution was to calculate an ROI for each division of its business.

The next issue it faced was intra-company trading, since a number of its divisions transferred some of their output to other divisions, which used this to make finished goods. DuPont needed a pricing method for such transfers to prevent the results of supplying divisions from being understated and those of receiving divisions from being overstated. After considering various options, it based the transfer price on the cost of the goods made by supplying divisions.

For an example of how transfer pricing works, let's consider a fictitious paint manufacturer called Chemical World. Because it sells its resins and coatings to separate markets, the company has split its business into a Resins division and a Coatings division. It needs a transfer pricing system, because every 1kg of coating it makes requires 0.5kg of internally manufactured resin to be mixed with 0.5kg of externally sourced material. Example 1 provides key figures for each division and the company as a whole

EXAMPLE 1

Resins

Direct material, external	£0.70 per kg
Direct material, internal	£0 per kg
Fixed overheads	£0.65 per kg
Cost per kg	£1.35

Total fixed overheads	£6,500,000
Budget production (kg)	10,000,000
Absorption rate	£0.65 per kg

External selling price per kg	£2.00
Internal selling price per kg	£0.00

External sales (kg)	8,000,000
Internal sales (kg)	2,000,000

Income statement

	Resins	Coatings	Total
External sales (£)	16,000,000	12,000,000	28,000,000
Internal sales (£)	0	0	0
Total sales (£)	16,000,000	12,000,000	28,000,000
Manufacturing costs (£)	13,500,000	5,600,000	19,100,000
Gross profit (£)	2,500,000	6,400,000	8,900,000

EXAMPLE 2

Resins

Direct material, external	£0.70 per kg
Direct material, internal	£0 per kg
Fixed overheads	£0.65 per kg
Cost per kg	£1.35

Total fixed overheads	£6,500,000
Budget production (kg)	10,000,000
Absorption rate	£0.65 per kg

External selling price per kg	£2.00
Internal selling price per kg	£0.70

External sales (kg)	8,000,000
Internal sales (kg)	2,000,000

Income statement

	Resins	Coatings	Total
External sales (£)	16,000,000	12,000,000	28,000,000
Internal sales (£)	1,400,000	0	1,400,000
Total sales (£)	17,400,000	12,000,000	29,400,000
Manufacturing costs (£)	13,500,000	7,000,000	20,500,000
Gross profit (£)	3,900,000	5,000,000	8,900,000

Coatings

Direct material, external	£1.10 per kg
Direct material, internal	£0 per kg
Fixed overheads	£0.30 per kg
Cost per kg	£1.40

Total fixed overheads	£1,200,000
Budget production (kg)	4,000,000
Absorption rate	£0.30 per kg

External selling price per kg	£3.00
Internal selling price per kg	£0.00

External sales (kg)	4,000,000
Internal sales (kg)	0

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based on next year's budgets. It shows the situation where no transfer pricing system is in place – ie, where resin is supplied at no cost to the Coatings division. The key information and calculations for this and the other five examples are as follows:

- Direct material, external: the cost of direct material purchased from third parties.
- Direct material, internal: the cost of direct material supplied by other divisions of the company.
- Resins division overhead absorption rate: $\frac{£6,500,000}{10,000,000\text{kg}} = £0.65$ per kg.
- Coatings division overhead absorption rate: $\frac{£1,200,000}{4,000,000\text{kg}} = £0.30$ per kg.
- Resins division external sales: $8,000,000\text{kg} \times £2$ per kg = $£16,000,000$.
- Resins division internal sales: $2,000,000\text{kg} \times £0$ per kg = $£0$. Note that an internal selling price is used in the other five examples.
- Resins division manufacturing costs: $10,000,000\text{kg} \times £1.35$ per kg = $£13,500,000$.
- The Coatings division needs $2,000,000\text{kg}$ of resin to make and sell $4,000,000\text{kg}$ of coating, since 0.5kg of resin is required for each 1kg of coating.
- The cost of the resin needed by the Coatings division to manufacture 1kg of coating is the internal selling price per kg $\times 0.5$, because 0.5kg of resin is required in making each 1kg of coating. In Example 2, for instance, it's $£0.70$ per kg $\times 0.5 = £0.35$ per kg.
- Coatings division external sales: $4,000,000\text{kg} \times £3$ per kg = $£12,000,000$.
- Coatings division internal sales: $£0$.
- Coatings division manufacturing costs: $4,000,000\text{kg} \times £1.40$ per kg = $£5,600,000$.
- Resins capacity: $10,000,000\text{kg}$.
- Coatings capacity: $5,000,000\text{kg}$.

The financial position set out in example 1 is not acceptable, because it doesn't reflect the financial performance of either division. The Resins division is subsidising Coatings since its output is being transferred for free. Such distorted results could cause Chemical World to make incorrect capital investment decisions, since Coatings appears to be highly profitable. The situation could also demotivate managers in Resins, as they will feel that their division is not being rewarded properly for its work – its products are being given away. DuPont decided to use a cost-based transfer pricing system to recompense supply-

EXAMPLE 3

Resins

Direct material, external	£0.70 per kg
Direct material, internal	£0 per kg
Fixed overheads	£0.65 per kg
Cost per kg	£1.35

Total fixed overheads	£6,500,000
Budget production (kg)	10,000,000
Absorption rate	£0.65 per kg

External selling price per kg	£2.00
Internal selling price per kg	£1.50

External sales (kg)	8,000,000
Internal sales (kg)	2,000,000

Income statement	Resins	Coatings	Total
External sales (£)	16,000,000	12,000,000	28,000,000
Internal sales (£)	3,000,000	0	3,000,000
Total sales (£)	19,000,000	12,000,000	31,000,000
Manufacturing costs (£)	13,500,000	8,600,000	22,100,000
Gross profit (£)	5,500,000	3,400,000	8,900,000

EXAMPLE 4

Resins

Direct material, external	£0.70 per kg
Direct material, internal	£0 per kg
Fixed overheads	£0.65
Cost per kg	£1.35

Total fixed overheads	£6,500,000
Budget production (kg)	10,000,000
Absorption rate	£0.65 per kg

External selling price per kg	£2.00
Internal selling price per kg	£1.62

External sales (kg)	8,000,000
Internal sales (kg)	2,000,000

Income statement	Resins	Coatings	Total
External sales (£)	16,000,000	12,000,000	28,000,000
Internal sales (£)	3,240,000	0	3,240,000
Total sales (£)	19,240,000	12,000,000	31,240,000
Manufacturing costs (£)	13,500,000	8,840,000	22,340,000
Gross profit (£)	5,740,000	3,160,000	8,900,000

Coatings

Direct material, external	£1.10 per kg
Direct material, internal	£0.75 per kg
Fixed overheads	£0.30 per kg
Cost per kg	£2.15

Total fixed overheads	£1,200,000
Budget production (kg)	4,000,000
Absorption rate	£0.30 per kg

External selling price per kg	£3.00
Internal selling price per kg	£0.00

External sales (kg)	4,000,000
Internal sales (kg)	0

EXAMPLE 5

Resins

Direct material, external	£0.75 per kg
Direct material, internal	£0 per kg
Fixed overheads	£0.70 per kg
Cost per kg	£1.45

Total fixed overheads	£7,000,000
Budget production (kg)	10,000,000
Absorption rate	£0.70 per kg

External selling price per kg	£2.00
Internal selling price per kg	£1.74

External sales (kg)	8,000,000
Internal sales (kg)	2,000,000

Income statement	Resins	Coatings	Total
External sales (£)	16,000,000	12,000,000	28,000,000
Internal sales (£)	3,480,000	0	3,480,000
Total sales (£)	19,480,000	12,000,000	31,480,000
Manufacturing costs (£)	14,500,000	9,080,000	23,580,000
Gross profit (£)	4,980,000	2,920,000	7,900,000

EXAMPLE 6

Resins

Direct material, external	£0.75 per kg
Direct material, internal	£0 per kg
Fixed overheads	£0.70 per kg
Cost per kg	£1.45

Total fixed overheads	£7,000,000
Budget production (kg)	10,000,000
Absorption rate	£0.70 per kg

External selling price per kg	£2.00
Internal selling price per kg	£1.62

External sales (kg)	8,000,000
Internal sales (kg)	2,000,000

Income statement	Resins	Coatings	Total
External sales (£)	16,000,000	12,000,000	28,000,000
Internal sales (£)	3,240,000	0	3,240,000
Total sales (£)	19,240,000	12,000,000	31,240,000
Manufacturing costs (£)	14,500,000	8,840,000	23,340,000
Gross profit (£)	4,740,000	3,160,000	7,900,000

Coatings

Direct material, external	£1.10 per kg
Direct material, internal	£0.87 per kg
Fixed overheads	£0.30 per kg
Cost per kg	£2.27

Total fixed overheads	£1,200,000
Budget production (kg)	4,000,000
Absorption rate	£0.30 per kg

External selling price per kg	£3.00
Internal selling price per kg	£0.00

External sales (kg)	4,000,000
Internal sales (kg)	0

ing divisions. But which cost-based system should apply in Chemical World's case?

In example 2 the transfer price of resin is based on marginal cost – ie, the cost of the direct material (£0.70 per kg) to the Resins division. Chemical World's overall profit is not affected by the use of transfer pricing, but the cake is now cut differently: Resins has a profit of $£3.9\text{m}$ while Coatings has a profit of $£5\text{m}$. Although Resins has received some compensation for what it supplies to Coatings, its managers are still unlikely to be satisfied with this arrangement, since Resins has been reimbursed only for the direct costs it has incurred in making the resin.

Example 3, which is based on full production costs (direct and indirect manufacturing costs), gives a better indication of the profitability of the two divisions: $£5.5\text{m}$ for Resins and $£3.4\text{m}$ for Coatings. But, once again, it's unlikely that managers at Resins would be happy with this system, since their division is in business to make a profit. Example 4 shows what would happen if a 20 per cent mark-up were applied to the full production cost: Resins would now have a profit of $£5.74\text{m}$ and Coatings would have $£3.16\text{m}$. While this seems a reasonable approach, the problem lies in getting the divisions to agree the mark-up.

Another issue associated with cost-based methods is the cost on which the mark-up is based. Should it be the actual or standard cost? If the mark-up is based on actual cost, then a supplying division that fails to control its costs can pass on part of its overspend to the receiving division. Example 5 shows that the Coatings division's profits would fall from $£3.16\text{m}$ to $£2.92\text{m}$ under this method.

Why should Coatings be penalised because Resins has failed to control its costs? It could also be argued that the use of actual costs encourages inefficiency, because an increase in costs leads to higher profits. So the mark-up should be based on standard cost, because this ensures that any overspend remains with the supplying division. Example 6 demonstrates the use of standard cost. While Chemical World's overall profit in both examples is $£7.9\text{m}$, the profit for Resins has fallen to $£4.74\text{m}$ and the profit for Coatings has risen to $£3.16\text{m}$. Using the standard cost also provides an incentive for the supplying division to control its costs, because it will retain all of the savings when its actual costs are below budget.