

Relevant costing and decision making

Introduction

Management at all levels within an organisation take decisions. The overriding requirement of the information that should be supplied by the cost accountant to aid decision making is that of **relevance**. This chapter therefore begins by looking at the costing technique required in decision-making situations, that of **relevant costing**, and explains how to decide which costs need taking into account when a decision is being made and which costs do not.

We then go on to see how to apply relevant costing to product mix decisions.

1 Relevant costs

1.1 Relevant costs

Relevant costs are future cash flows arising as a direct consequence of a decision.

- Relevant costs are **future costs**
- Relevant costs are **cash flows**
- Relevant costs are **incremental costs**

Decision making should be based on relevant costs.

- (a) **Relevant costs are future costs.** A decision is about the future and it cannot alter what has been done already. Costs that have been incurred in the past are totally irrelevant to any decision that is being made 'now'. Such costs are **past costs** or **sunk costs**.

Costs that have been incurred include not only costs that have already been paid, but also costs that have been **committed**. A **committed cost** is a future cash flow that will be incurred anyway, regardless of the decision taken now.

- (b) **Relevant costs are cash flows.** Only cash flow information is required. This means that costs or charges which do not reflect **additional cash spending** (such as depreciation and notional costs) should be ignored for the purpose of decision making.

- (c) **Relevant costs are incremental costs.** For example, if an employee is expected to have no other work to do during the next week, but will be paid his basic wage (of, say, \$100 per week) for attending work and doing nothing, his manager might decide to give him a job which earns the organisation \$40. The net gain is \$40 and the \$100 is irrelevant to the decision because although it is a future cash flow, it will be incurred anyway whether the employee is given work or not.

Other terms are sometimes used to describe relevant costs.

1.2 Avoidable costs

Avoidable costs are costs which would not be incurred if the activity to which they relate did not exist.

One of the situations in which it is necessary to identify the avoidable costs is in deciding whether or not to **discontinue a product**. The only costs which would be saved are the **avoidable costs** which are usually the variable costs and sometimes some specific costs. Costs which would be incurred whether or not the product is discontinued are known as **unavoidable costs**.

1.3 Differential costs and opportunity costs

Relevant costs are also **differential costs** and **opportunity costs**.

- **Differential cost** is the difference in total cost between alternatives.
- An **opportunity cost** is the value of the benefit sacrificed when one course of action is chosen in preference to an alternative.

For example, if decision option A costs \$300 and decision option B costs \$360, the **differential cost** is \$60.

1.3.1 Example: Differential costs and opportunity costs

Suppose for example that there are three options, A, B and C, only one of which can be chosen. The net profit from each would be \$80, \$100 and \$70 respectively.

Since only one option can be selected option B would be chosen because it offers the biggest benefit.

Profit from option B	\$ 100
Less opportunity cost (ie the benefit from the most profitable alternative, A)	80
Differential benefit of option B	<u>20</u>

The decision to choose option B would not be taken simply because it offers a profit of \$100, but because it offers a differential profit of \$20 in excess of the next best alternative.

1.4 Controllable and uncontrollable costs

We came across the term **controllable costs** at the beginning of this study text. **Controllable costs** are items of expenditure which can be directly influenced by a given manager within a given time span.

As a general rule, **committed fixed costs** such as those costs arising from the possession of plant, equipment and buildings (giving rise to depreciation and rent) are largely **uncontrollable** in the short term because they have been committed by longer-term decisions.

Discretionary fixed costs, for example, advertising and research and development costs can be thought of as being **controllable** because they are incurred as a result of decisions made by management and can be raised or lowered at fairly short notice.

1.5 Sunk costs

A **sunk cost** is a past cost which is not directly relevant in decision making.

The principle underlying decision accounting is that management decisions can only affect the future. In decision making, managers therefore require information about **future costs and revenues** which would be affected by the decision under review. They must not be misled by events, costs and revenues in the past, about which they can do nothing.

Sunk costs, which have been charged already as a cost of sales in a previous accounting period or will be charged in a future accounting period although the expenditure has already been incurred, are irrelevant to decision making.

1.5.1 Example: Sunk costs

An example of a sunk cost is development costs which have already been incurred. Suppose that a company has spent \$250,000 in developing a new service for customers, but the marketing department's most recent findings are that the service might not gain customer acceptance and could be a commercial failure. The decision whether or not to abandon the development of the new service would have to be taken, but the \$250,000 spent so far should be ignored by the decision makers because it is a **sunk cost**.

1.6 Fixed and variable costs

In general, variable costs will be relevant costs and fixed costs will be irrelevant to a decision.

Unless you are given an indication to the contrary, you should assume the following.

- Variable costs will be relevant costs.
- Fixed costs are irrelevant to a decision.

This need not be the case, however, and you should analyse variable and fixed cost data carefully. Do not forget that 'fixed' costs may only be fixed in the short term.

1.6.1 Non-relevant variable costs

There might be occasions when a variable cost is in fact a sunk cost (and therefore a **non-relevant variable cost**). For example, suppose that a company has some units of raw material in inventory. They have been paid for already, and originally cost \$2,000. They are now obsolete and are no longer used in regular production, and they have no scrap value. However, they could be used in a special job which the company is trying to decide whether to undertake. The special job is a 'one-off' customer order, and would use up all these materials in inventory.

- (a) In deciding whether the job should be undertaken, the relevant cost of the materials to the special job is nil. Their original cost of \$2,000 is a **sunk cost**, and should be ignored in the decision.
- (b) However, if the materials did have a scrap value of, say, \$300, then their relevant cost to the job would be the **opportunity cost** of being unable to sell them for scrap, ie \$300.

1.6.2 Attributable fixed costs

There might be occasions when a fixed cost is a relevant cost, and you must be aware of the distinction between 'specific' or '**directly attributable**' fixed costs, and general fixed overheads.

Directly attributable fixed costs are those costs which, although fixed within a relevant range of activity level are relevant to a decision for either of the following reasons.

- (a) They could increase if certain extra activities were undertaken. For example, it may be necessary to employ an extra supervisor if a particular order is accepted. The extra salary would be an **attributable fixed cost**.
- (b) They would decrease or be eliminated entirely if a decision were taken either to reduce the scale of operations or shut down entirely.

General fixed overheads are those fixed overheads which will be unaffected by decisions to increase or decrease the scale of operations, perhaps because they are an apportioned share of the fixed costs of items which would be completely unaffected by the decisions. General fixed overheads are not relevant in decision making.

1.6.3 Absorbed overhead

Absorbed overhead is a notional accounting cost and hence should be ignored for decision-making purposes. It is overhead incurred which may be relevant to a decision.

1.7 The relevant cost of materials

The relevant cost of raw materials is generally their **current replacement cost**, *unless* the materials have already been purchased and would not be replaced once used. In this case the relevant cost of using them is the **higher** of the following.

- Their current resale value
- The value they would obtain if they were put to an alternative use

If the materials have no resale value and no other possible use, then the relevant cost of using them for the opportunity under consideration would be nil.

Question

Relevant cost of materials

O'Reilly has been approached by a customer who would like a special job to be done for him, and who is willing to pay \$22,000 for it. The job would require the following materials.

Material	Total units required	Units already in inventory	Book value of units in inventory \$/unit	Realisable value \$/unit	Replacement cost \$/unit
A	1,000	0	-	-	6
B	1,000	600	2	2.50	5
C	1,000	700	3	2.50	4
D	200	200	4	6.00	9

Material B is used regularly by O'Reilly, and if units of B are required for this job, they would need to be replaced to meet other production demand.

Materials C and D are in inventory as the result of previous over-buying, and they have a restricted use. No other use could be found for material C, but the units of material D could be used in another job as substitute for 300 units of material E, which currently costs \$5 per unit (of which the company has no units in inventory at the moment).

Required

Calculate the relevant costs of material for deciding whether or not to accept the contract.

Question

Relevant material costs

A company regularly uses a material. It currently has 100kg in inventory for which it paid \$200. If it were sold it could be sold for \$3 per kg. The market price is now \$4 per kg. A customer has placed an order that will use 200kg of the material. The relevant cost of the 200kg is:

- | | | | |
|---|-------|---|-------|
| A | \$500 | C | \$700 |
| B | \$600 | D | \$300 |

Answer

- (a) **Material A** is not yet owned. It would have to be bought in full at the replacement cost of \$6 per unit.
- (b) **Material B** is used regularly by the company. There are existing inventories (600 units) but if these are used on the contract under review a further 600 units would be bought to replace them. Relevant costs are therefore 1,000 units at the replacement cost of \$5 per unit.
- (c) 1,000 units of **material C** are needed and 700 are already in inventory. If used for the contract, a further 300 units must be bought at \$4 each. The existing inventories of 700 will not be replaced. If they are used for the contract, they could not be sold at \$2.50 each. The realisable value of these 700 units is an opportunity cost of sales revenue forgone.
- (d) The required units of **material D** are already in inventory and will not be replaced. There is an opportunity cost of using D in the contract because there are alternative opportunities either to sell the existing inventories for \$6 per unit (\$1,200 in total) or avoid other purchases (of material E), which would cost $300 \times \$5 = \$1,500$. Since substitution for E is more beneficial, \$1,500 is the opportunity cost.

(e) **Summary of relevant costs**

	\$
Material A ($1,000 \times \$6$)	6,000
Material B ($1,000 \times \$5$)	5,000
Material C ($300 \times \$4$) plus ($700 \times \$2.50$)	2,950
Material D	1,500
Total	<u>15,450</u>

Answer

The material is in regular use and so 200kg will be purchased. The relevant cost is therefore $200 \times \$4 = \$800$. Answer D.

1.8 The relevant cost of labour

The relevant cost of labour, in different situations, is best explained by means of an example.

1.8.1 Example: Relevant cost of labour

LW is currently deciding whether to undertake a new contract. 15 hours of labour will be required for the contract. LW currently produces product L, the standard cost details of which are shown below.

STANDARD COST CARD PRODUCT L	
	\$/unit
Direct materials (10kg @ \$2)	20
Direct labour (5 hrs @ \$6)	30
	50
Selling price	72
Contribution	<u>22</u>

- What is the relevant cost of labour if the labour must be hired from outside the organisation?
- What is the relevant cost of labour if LW expects to have 5 hours spare capacity?
- What is the relevant cost of labour if labour is in short supply?

Solution

- Where labour must be hired from outside the organisation, the relevant cost of labour will be the variable costs incurred.

Relevant cost of labour on new contract = 15 hours @ \$6 = \$90

- It is assumed that the 5 hours spare capacity will be paid anyway, and so if these 5 hours are used on another contract, there is no additional cost to LW.

Relevant cost of labour on new contract

	\$
Direct labour (10 hours @ \$6)	60
Spare capacity (5 hours @ \$0)	0
	<u>60</u>

- Contribution earned per unit of Product L produced = \$22

If it requires 5 hours of labour to make one unit of product L, the contribution earned per labour hour = $\$22/5 = \$4.40$.

Relevant cost of labour on new contract

	\$
Direct labour (15 hours @ \$6)	90
Contribution lost by not making product L ($\$4.40 \times 15$ hours)	66
	<u>156</u>

It is important that you should be able to identify the relevant costs which are appropriate to a decision. In many cases, this is a fairly straightforward problem, but there are cases where great care should be taken. Attempt the following question.

9.

Question

Customer order

A company has been making a machine to order for a customer, but the customer has since gone into liquidation, and there is no prospect that any money will be obtained from the winding up of the company.

Costs incurred to date in manufacturing the machine are \$50,000 and progress payments of \$15,000 had been received from the customer prior to the liquidation.

The sales department has found another company willing to buy the machine for \$34,000 once it has been completed.

To complete the work, the following costs would be incurred.

- (a) Materials: these have been bought at a cost of \$6,000. They have no other use, and if the machine is not finished, they would be sold for scrap for \$2,000.
- (b) Further labour costs would be \$8,000. Labour is in short supply, and if the machine is not finished, the work force would be switched to another job, which would earn \$30,000 in revenue, and incur direct costs of \$12,000 and absorbed (fixed) overhead of \$8,000.
- (c) Consultancy fees \$4,000. If the work is not completed, the consultant's contract would be cancelled at a cost of \$1,500.
- (d) General overheads of \$8,000 would be added to the cost of the additional work.

Required

Assess whether the new customer's offer should be accepted.

Answer

- (a) Costs incurred in the past, or revenue received in the past are not relevant because they cannot affect a decision about what is best for the future. Costs incurred to date of \$50,000 and revenue received of \$15,000 are 'water under the bridge' and should be ignored.
- (b) Similarly, the price paid in the past for the materials is **irrelevant**. The only relevant cost of materials affecting the decision is the opportunity cost of the revenue from scrap which would be forgone – \$2,000.

(c) **Labour costs**

	\$
Labour costs required to complete work	8,000
Opportunity costs: contribution forgone by losing other work \$(30,000 – 12,000)	<u>18,000</u>
Relevant cost of labour	<u>26,000</u>

- (d) The **incremental cost** of consultancy from completing the work is \$2,500.

	\$
Cost of completing work	4,000
Cost of cancelling contract	<u>1,500</u>
Incremental cost of completing work	<u>2,500</u>

- (e) **Absorbed overhead is a notional accounting cost** and should be ignored. Actual overhead incurred is the only overhead cost to consider. General overhead costs (and the absorbed overhead of the alternative work for the labour force) should be ignored.

(f) **Relevant costs may be summarised as follows.**

	\$	\$
Revenue from completing work		34,000
Relevant costs		
Materials: opportunity cost	2,000	
Labour: basic pay	8,000	
opportunity cost	18,000	
Incremental cost of consultant	<u>2,500</u>	
		<u>30,500</u>
Extra profit to be earned by accepting the order		<u>3,500</u>

1.9 The relevant cost of an asset

The **relevant cost** of an asset represents the amount of money that a company would have to receive if it were deprived of an asset in order to be no worse off than it already is. We can call this the **deprival value**.

The deprival value of an asset is best demonstrated by means of an example.

1.9.1 Example: Deprival value of an asset

A machine cost \$14,000 ten years ago. It is expected that the machine will generate future revenues of \$10,000. Alternatively, the machine could be scrapped for \$8,000. An equivalent machine in the same condition would cost \$9,000 to buy now. What is the deprival value of the machine?

Solution

Firstly, let us think about the relevance of the costs given to us in the question.

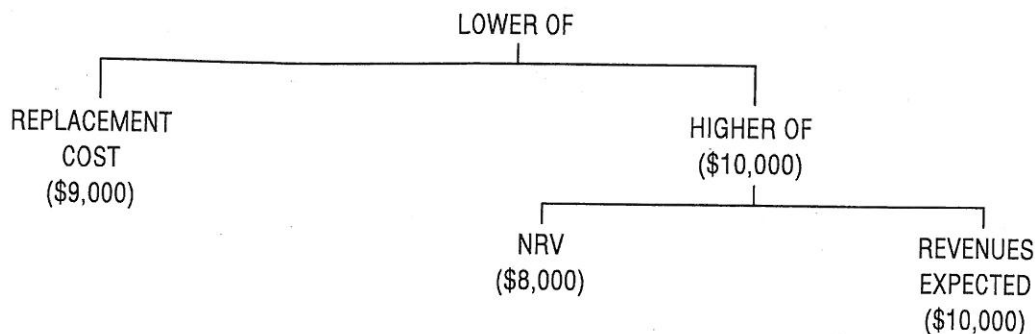
Cost of machine = \$14,000 = past/sunk cost

Future revenues = \$10,000 = revenue expected to be generated

Net realisable value = \$8,000 = scrap proceeds

Replacement cost = \$9,000

When calculating the **deprival value** of an asset, use the following diagram.



Therefore, the deprival value of the machine is the lower of the replacement cost and \$10,000. The deprival value is therefore \$9,000.

RELEVANT COST PRICING

✓ 4 Company XYZ has surplus manufacturing capacity and has been asked to tender for a special order. The following resources and costs would be required to fulfil the special order:

- (i) Three employees would have to be transferred from other work in order to meet the skill requirements of the order. Total wages for the expected time spent on the special order would be £4,360 (including bonus payments to the three employees, not specifically related to the order, of £460). The normal work of the three employees would be carried out by sub-contract staff at a total cost to Company XYZ of £3,680.
- (ii) 80 kg of Material A are required. Company XYZ has 268 kg of Material A in stock. The material, which cost £7.60 per kg when purchased, is no longer used by the company in its normal business. The stock could be sold, in whole or in part, for £7.00 per kg. The replacement cost of Material A is £8.30 per kg.
- (iii) 135 kg of Material B are required. Company XYZ has 532 kg of Material B in stock. The weighted average cost of the stock of Material B, which is used regularly in the company's normal business, is £10.265 per kg. The replacement cost is £10.60 per kg.
- (iv) Overheads (production and non-production) are absorbed at 150% of direct labour costs. Estimated incremental overhead costs as a result of taking on the special order would be £1,260.

Required:

- (a) Determine the minimum selling price that could be quoted for the special order so as to cover relevant costs.
 - (b) Determine the selling price (to the nearest £) that should be quoted for the special order if Company XYZ wishes to earn a profit margin (net of relevant costs) of 20% of selling price.
 - (c) Explain the concept of relevant costs using your analysis of raw material costs in part (a) as an illustration.
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- (d) Outline the limitations of routine management accounting information in providing guidance for decision-making.

(a) Special order: minimum selling price to cover relevant costs

Relevant costs:	£
Labour	3,680
Material A	560 (80 kg at £7.00)
Material B	1,431 (135 kg at £10.60)
Overheads	1,260
	£6,931

Therefore, minimum selling price is £6,931.

(b) Special order: selling price to earn 20% profit margin net of relevant costs

Relevant costs	£6,931
+ (1 - 0.2)	0.8 (i.e. relevant costs % of sales expressed as a decimal)
= Selling price	£8,664

Concept of relevant costs:

The concept of relevant costs applies in decision making. Costs are relevant to a decision if they are affected depending upon the course of action chosen. Costs that are incurred regardless of the course of action chosen are irrelevant because they are unaffected by the decision.

Relevant costs, for each relevant resource, represent:
either

- (i) the incremental (additional) costs incurred as a result of taking a particular course of action,
or
- (ii) the revenues foregone (opportunity cost) by not being able to take an alternative course of action.

Taking Material B for example, the weighted average cost of the existing stock is irrelevant because it has already been incurred. What is relevant is the cost that would be incurred as a consequence of using 135 kg of the material in the special order. In the situation described, usage of stock would lead to replacement (i.e. less available for normal business) at an incremental cost of £1,431 (135 kg at £10.60).

Taking Material A for example, the historic cost is again irrelevant as is the cost of replacement because this is not an action that would be considered. The relevant cost is the lost revenue of £560 (80 kg at £7.00) from not being able to sell the material (i.e. it is an opportunity cost).

Limitations of routine management accounting information for decision making:

Routine management accounting information may have limited usefulness for any particular decision because:

- (i) Routine management accounting information is reporting past performance whereas decisions must be based on future expectations.
- (ii) Routine management accounting information is prepared according to a set of general guidelines and conventions, for example about cost behaviour and cost allocation. Decisions require information that is specific to a particular situation at a particular time.
- (iii) Uncertainty is a feature of all decisions and a range of financial estimates may be required.
- (iv) Other factors, less easily quantified in financial terms, invariably need to be considered.