CHAPTER 2

An introduction to cost terms and purposes

Teaching tips and points to stress

*Costs in general*

Cost assignment is a general term for attaching either direct or indirect costs to cost objects. The distinction between direct and indirect costs is important because direct costs are directly traced to the cost object, while indirect costs are often pooled and then allocated to the cost object with less precision. Management therefore has more confidence in the accuracy of direct costs. The text uses the term cost tracing to refer specifically to assigning direct costs to cost objects. Cost allocation is reserved for assigning indirect costs to cost objects.

Cost objects include (1) activities or processes, (2) outputs of processes, such as products,   
services and projects; (3) parts of the organisation (e.g. departments or programmes); and (4)   
customers. Information on costs associated with these cost objects facilitates decisions such as

(1) which manufacturing process is most economical, (2) what price should be charged for the   
service, (3) which department uses its resources most efficiently and (4) which customers   
contribute most to the company’s profits. There is more to cost accounting than product costing.

*Direct costs and indirect costs*

Students have trouble with the distinctions between direct/indirect costs and cost tracing/cost   
allocation. Familiar examples can help. Public accounting firms directly trace direct   
professional labour costs to each audit engagement (through time sheets). In contrast, rent on the   
firm’s office and depreciation on its computers cannot be traced to individual engagements.   
These are indirect costs that must be allocated to the different engagements. Allocation of   
indirect costs is a difficult but important topic that is covered in more detail in later chapters.

Example: Is photocopying a direct or an indirect cost with respect to department cost objects? In   
the past, it was difficult to keep track of the amount of copying done by different departments.   
Moreover, there was generally less copying. Photocopying was typically considered an indirect   
cost because it was often an immaterial amount and hard to trace. Today, businesses are making   
more photocopies than ever before. Counters inserted into copiers (copy keys) easily keep track   
of the number of copies made by each user. Because copying costs are now higher and easier to   
trace, they are more often directly traced. (An additional benefit of the counters is that they may   
induce employees to make fewer copies because the number of copies is now more observable.)

*Cost drivers and cost management*

Cost management occurs when managers actively strive to reduce costs. Two major avenues for   
cost management are focusing on value-added activities (and eliminating non-value-added   
activities such as stock handling) and reducing consumption of cost drivers in value-added   
activities. Reduced consumption of cost drivers reduces costs only if managers actively squeeze   
costs down. As more managers do their own word processing, typing by secretaries declines.

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But unless management reduces the number of secretaries in response to the reduced workload, secretarial costs will not reduce.

*Two types of cost behaviour pattern: variable costs and fixed costs*

The distinction between variable costs (VCs) and fixed costs (FCs) is necessary to address basic   
questions such as how much manufacturing costs change if the level of output increases by 5%.   
For example, many fast-food restaurants guarantee workers only an hour or two of work per   
shift. If sales are less than expected, workers can be dismissed for the shift after their guaranteed   
hour (or two). In this case, direct-labour cost varies directly with output (sales). In contrast,   
many government workers are salaried and cannot be dismissed except under extreme   
circumstances. Here, direct-labour costs for a government department are relatively fixed.

Students are often confused about when VCs are variable, and when FCs are fixed. Variable costs vary in total and FCs are fixed in total. However, VCs per unit are consistent, and FCs per unit decline as more units are produced.

*Total costs and unit costs*

Students often treat ‘unitised’ fixed costs as if they were variable costs, forgetting that fixed   
costs are fixed in total. They attempt to calculate total costs by multiplying the cost per unit by   
the number of units. Because of this misleading nature of unitised fixed costs, it is better to base   
projections and comparisons on total costs. When estimating total costs, students should   
consider variable costs as an amount per unit and fixed costs as a lump sum total amount.

*Financial statements and cost terminology*

The basic concepts of assigning costs to cost objects (and using this information for planning and control) apply to service, merchandising and manufacturing companies. Students find it easier to grasp the basic concepts by starting with service companies, which are the simplest as they have no stocks. Merchandisers add the complications of purchases and stocks. The final step is manufacturers, which is more difficult due to the complexities of cost of good manufactured (CGM) and the three types of stock.

Solutions to review questions

2.1 A cost object is anything for which a separate measurement of costs is desired.

Examples include a product, a service, a project, a customer, a brand category, an activity, a department and a programme.

2.2 Costs are not direct or indirect in isolation. A cost object (such as a product, service or

project) must be specified.

• Direct costs of a cost object are those costs that are related to the particular cost   
 object and that can be traced to it in an economically feasible (cost effective) way.

• Indirect costs of a cost object are those costs that are related to the particular cost   
 object but cannot be traced to it in an economically feasible (cost effective) way.

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Assume that the cost object is a Macintosh computer product. Apple assembles multiple products in each of its plants. The computer screen is a direct cost of the Macintosh. In contrast, the salary of the security guard at the plant where the Macintosh is assembled would be an indirect cost of the Macintosh.

2.3 Consider a supervisor’s salary in a maintenance department of a telephone company. If

the cost object is the department, the salary is a direct cost. If the cost object is a telephone call by a customer, the salary is an indirect cost.

2.4 Factors affecting the classification of a cost as direct or indirect include:

1 the materiality of the cost in question

2 available information-gathering technology

3 design of operations

4 contractual arrangements.

2.5 A cost driver is any factor that affects total costs. Examples include:

Business function Example of cost driver

Research and Development Number of research projects

Design Number of products in design

Production Number of units produced

Marketing Number of advertisements run

Distribution Number of items distributed

Customer service Number of service calls

2.6 The relevant range is the range of the cost driver in which a specific relationship

between cost and driver is valid. This concept enables the use of linear cost functions when examining cost-volume-profit (CVP) relationships as long as the volume levels are within that relevant range.

2.7 A unit cost is calculated by dividing some total cost (the numerator) by some number of

units (the denominator). In many cases the numerator will include a fixed cost that will not change despite changes in the number of units to be assembled. It is erroneous in those cases to multiply the unit cost by volume changes to predict changes in total costs at different volume levels.

2.8 Descriptions of the three sectors are:

• Service-sector companies provide services or intangible products to their customers -  
 for example, legal advice or an audit. These companies do not have any stock of   
 intangible products at the end of an accounting period.

• Merchandising-sector companies provide tangible products they have previously   
 purchased in the same basic form from suppliers. Merchandise purchased from   
 suppliers but not sold at the end of an accounting period is held as stock.

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• Manufacturing-sector companies provide tangible products that have been converted   
 to a different form from the products purchased from suppliers. At the end of an   
 accounting period, stock of a manufacturer can include direct materials, work in   
 progress and finished goods.

Thus, manufacturing and merchandising companies have stock while service companies do not. Manufacturing companies have direct materials, work in progress and finished goods stock whereas merchandising companies have only goods purchased for resale stock (merchandise stock).

2.9 The three major categories of the stockable costs of a manufactured product are:

1 direct materials costs

2 direct manufacturing labour costs

3 indirect manufacturing costs.

2.10 *Direct materials costs*: The acquisition costs of all materials that eventually become part

of the cost object (say, units finished or in progress) and that can be traced to that cost   
object in an economically feasible way. Acquisition costs of direct materials include   
freight-in (inward delivery) charges, sales taxes and customs duties.  *Direct   
manufacturing labour costs*: The compensation of all manufacturing labour that is   
specifically identified with the cost object (say, units finished or in progress) and that   
can be traced to the cost object in an economically feasible way. Examples include   
wages and fringe benefits paid to machine operators and assembly-line workers.

*Indirect manufacturing costs*: All manufacturing costs considered to be part of the cost object (say, units finished or in progress) but that cannot be individually traced to that cost object in an economically feasible way. Examples include power supplies, indirect materials, indirect manufacturing labour, plant rent, plant insurance, property taxes on plants, plant depreciation and the compensation of plant managers.

*Prime costs*: All direct manufacturing costs. In the two-part classification of manufacturing costs, prime costs would comprise direct materials costs. In the threepart classification, prime costs would comprise direct materials costs and direct manufacturing labour costs.

*Conversion costs*: All manufacturing costs other than direct materials costs.

Solutions to exercises

2.11 Total costs and unit costs. (10 min)

1 Total cost, €40,000. Unit cost per person, €40,000 ÷ 500 = €80.00

2 Total cost, €40,000. Unit cost per person, €40,000 ÷ 2,000 = €20.00

3 The main lesson of this problem is to alert the student early in the course to the   
 desirability of thinking in terms of total costs rather than unit costs wherever   
 feasible. Changes in the number of cost driver units will affect total variable costs   
 but not total fixed costs. In our example, it would be perilous to use either the   
 €80.00 or the €20.00 unit cost to predict the total cost because the total costs are not

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affected by the attendance. Instead, the student association should use the €40,000 total cost. Obviously, if the musical group agreed to work for, say €40.00 per person, such a unit variable cost could be used to predict the total cost.

2.13 Total costs and unit costs. (10 min)

1 Unit cost = Total costs ÷ Number of units

Total costs Number of units Unit cost

a €60,000 200 €300

b €60,000 250 €240

c €60,000 300 €200

2 The unit-cost figures per passenger calculated in requirement 1 should play no role   
 in predicting the total air-flight costs to be paid next month. Weltferien pays Saxon-  
 Air on a per round-trip flight basis, not on a per passenger basis. Hence, the cost   
 driver for next month is the number of round-trip flights, not the number of   
 passengers.

2.14 Classification of costs, service sector. (15-20 min)

*Cost object*: Each individual focus group

*Cost variability*: With respect to changes in the number of focus groups

There may be some debate over classifications of individual items. Debate is more likely as regards cost variability.

Cost item D or I V or F

A D V

B I F

C I Va

D I F

E D V

F I F

G D V

H I Vb

a  Some students will note that phone call costs are variable when each call has a separate charge. It may be a fixed cost if Presta-Serviços has a flat monthly charge for a line, irrespective of the amount of usage.

b Petrol costs are likely to vary with the number of focus groups. However, vehicles likely serve multiple purposes and detailed records may be required to examine how costs vary with changes in one of the many purposes served.

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2.15 Classification of costs, merchandising sector. (15-20 min)

*Cost object*: Film section of store

*Cost variability*: With respect to changes in the number of films sold Assumptions may be made over classifications of individual items. This is mainly in relation to cost variability. Whether DVDs and videos cost the same is another matter.

Cost item D or I V or F

A I F

B I V

C D V

D D F

E I F

F I V

G I F

H D V

2.16 Cost drivers and the value chain. (15 min)

1

Business function area Representative cost driver

A Research and development Number of patents filed with government agency

B Design of products/processes Hours spent designing cars

C Production Hours assembly line in operation

D Marketing Minutes of television advertising time

E Distribution Number of cars shipped

F Customer service Number of calls to free customer services

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Business function area Representative cost driver

A Research and development • Hours of design and testing work

• Number of new models in development

B Design of products/processes • Number of focus groups on alternative models and

designs

• Hours of engineering and retooling

C Production • Number of units coming off assembly line

• Number of models manufactured

D Marketing • Number of promotion packages mailed

• Number of sales

E Distribution • Number of cars shipped overseas

• Number of cars delivered to showrooms

F Customer service • Number of cars recalled

• Number of personnel on free customer phone lines

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2.17 Calculating cost of goods manufactured and cost of goods sold. (20-25 min)

*Schedule of cost of goods manufactured for the year ended 31 December 2005*

*(in €million)*

€m €m

Direct materials used 13.05

Direct manufacturing labour costs 15.10

Indirect manufacturing costs:

Property tax on plant building 0.45

Plant utilities 2.56

Depreciation of plant building 1.35

Depreciation of plant equipment 1.65

Plant repairs and maintenance 2.40

Indirect manufacturing labour costs 3.45

Indirect materials used 1.65

Miscellaneous plant overhead 0.60 14.10

Manufacturing costs incurred during 2005 32.25

*Add* opening work in progress stock, 1 Jan. 2005 3.00

Total manufacturing costs to account for 35.25

Deduct closing work in progress stock, 31 Dec. 2005 3.90

Cost of goods manufactured 31.35

*Schedule of cost of goods sold for the year ended 31 December 2005 (in €million)*

€m

Opening finished goods, 1 Jan. 2005 4.05

Cost of goods manufactured (above) 31.35

Cost of goods available for sale 35.40

Closing finished goods, 31 Dec. 2005 5.10

Cost of goods sold 30.30

2.18 Income statement and schedule of cost of goods manufactured. (25-30 min)

*Howell Ltd*

*Income Statement for the Year Ended 31 December 2005*

*(in £millions)*

£m £m

Revenues 950

Cost of goods sold:

Opening finished goods, 1 Jan. 2005 70

Cost of goods manufactured (below) 645

Cost of goods available for sale 715

Closing finished goods, 31 Dec. 2005 55 660

Gross margin 290

Marketing, distribution, and customer-service costs 240

Operating income 50

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*Howell Ltd*

*Schedule of cost of goods manufactured for the year ended 31 December 2005   
 (in £millions)*

£ £

Direct materials costs:

Opening stock, 1 Jan. 2005 15

Purchases of direct materials 325

Cost of direct materials available for use 340

Closing stock, 31 Dec. 2005 20

Direct materials used 320

Direct manufacturing labour costs 100

Indirect manufacturing costs:

Indirect manufacturing labour 60

Plant supplies used 10

Plant utilities 30

Depreciation - plant, building and equipment 80

Plant supervisory salaries 5

Miscellaneous plant overhead 35 220

Manufacturing costs incurred during 2005 640

*Add* opening work in progress stock, 1 Jan. 2005 10

Total manufacturing costs to account for 650

Deduct closing work in progress, 31 Dec. 2005 5

Cost of goods manufactured £645

2.19 Interpretation of statements. (20-25 min)

1 The schedule in 2.18 can become a Schedule of cost of goods manufactured and   
 sold simply by including the opening and closing finished goods stock figures in the   
 supporting schedule, rather than directly in the body of the income statement. Note   
 that the term cost of goods manufactured refers to the cost of goods brought to   
 completion (finished) during the accounting period, whether they were started   
 before or during the current accounting period. Some of the manufacturing costs   
 incurred are held back as costs of the closing work in progress; similarly, the costs   
 of the opening work in progress stock become a part of the cost of goods   
 manufactured for 2005.

2 The sales manager’s salary would be charged as a marketing cost as incurred by   
 both manufacturing and merchandising companies. It is basically an operating cost   
 that appears below the gross margin line on an income statement. In contrast, an   
 assembler’s wages would be assigned to the products worked on. Thus, the wages   
 cost would be charged to work in progress and would not be expensed until the   
 product is transferred from finished goods stock to cost of goods sold as the product   
 is sold.

3 The direct-indirect distinction can be resolved only with respect to a particular cost   
 object. For example, in defence contracting, the cost object may be defined as a   
 contract. Then, a plant supervisor’s salary may be charged directly and wholly to   
 that single contract.

4 Direct materials used = £320,000,000 ÷ 1,000,000 units = £320 per unit   
 Depreciation = £80,000,000 ÷ 1,000,000 units = £80 per unit

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5 Direct materials unit cost would be unchanged at £320. Depreciation unit cost   
 would be £80,000,000 ÷ 1,200,000 = £66.67 per unit. Total direct materials costs   
 would rise by 20% to £384,000,000, whereas total depreciation would be unaffected   
 at £80,000,000.

6 Unit costs are averages and they must be interpreted with caution. The £320 direct   
 materials unit cost is valid for predicting total costs because direct materials is a   
 variable cost; total direct materials costs indeed change as output levels change.   
 However, fixed costs like depreciation must be interpreted quite differently from   
 variable costs. A common error in cost analysis is to regard all unit costs as one - as   
 if all the total costs to which they are related are variable costs. Changes in output   
 levels (the denominator) will affect total variable costs, but not total fixed costs.   
 Graphs of the two costs may clarify this point; it is safer to think in terms of total   
 costs than in terms of unit costs.

2.20 Finding unknown balances. (20-25 min)

Let G = given, I = inferred.

Step 1: Use gross margin formula Case 1 Case 2

Revenues

Cost of goods sold Gross margin

Step 2: Use schedule of cost of goods manufactured   
 formula

£32,000G £31,800G

A 20,700I 20,000G

11,300G C 11,800I

Case 1 Case 2

Direct materials used £8,000G £2,000G

Direct manufacturing labour costs 3,000G 5,000G

Indirect manufacturing costs 7,000G D 6,500I

Manufacturing costs incurred 18,000I 23,500I

Add opening work in progress, 1/1 0G 800G

Total manufacturing costs to account for 18,000I 24,300I

Deduct closing work in progress, 31/12 0G 3,000G

Cost of goods manufactured 18,000I 21,300I

Step 3: Use cost of goods sold formula Case 1 Case 2

Opening finished goods stock, 1/1 Cost of goods manufactured

Cost of goods available for sale Closing finished goods stock, 31/12 Cost of goods sold

For case 1, do steps 1, 2 and 3 in order. For case 2, do steps 1, 3 and then 2.

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£4,000G £4,000G

18,000I 21,300I

22,000I 25,300I

B 1,300I 5,300G

20,700I 20,000G

2.21 Fire loss, calculating stock costs. (30-40 min)

1 €50,000 2 €28,000 3 €62,000

This problem is not as easy as it first appears. These answers are obtained by working

from the known figures to the unknowns in the schedule below. The basic relationships

between categories of costs are:

Prime costs (given) = €294,000

Direct materials used = €294,000

Direct manufacturing labour costs = €294,000 - €180,000 = €114,000

Conversion costs = Direct manufacturing labour costs ÷ 0.6

€180,000 ÷ 0.6 = €300,000

Indirect manufacturing costs = €300,000 - €180,000 = €120,000

(or 0.40 = €300,000)

Schedule of Calculations

€

Direct materials, 1/1/2005 16,000

Direct materials purchased 160,000

Direct materials available for use 176,000

Direct materials, 26/2/2005 3 = 62,000

Direct materials used (€294,000 - €180,000) 114,000

Direct manufacturing labour costs 180,000

Prime costs 294,000

Indirect manufacturing costs 120,000

Manufacturing costs incurred during the current period 414,000

*Add* work in progress, 1/1/2005 34,000

Manufacturing costs to account for 448,000

*Deduct* work in progress, 26/2/2005 2 = 28,000

Cost of goods manufactured 420,000

*Add* finished goods, 1/1/2005 30,000

Cost of goods available for sale (given) 450,000

*Deduct* finished goods, 26/2/2005 1 = 50,000

Cost of goods sold (80% of €500,000) €400,000

2.22 Comprehensive problem on unit costs, product costs. (30 min)

1 If 2 kg of direct materials are used to make each unit of finished product, 100,000   
 units × 2 kg, or 200,000 kg were used at €l0.70 per kg of direct materials (€140,000   
 ÷ 200,000 kg). Therefore, the closing stock of direct materials is 2,000 kg × €0.70 =   
 €1,400.

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Direct materials costs

Direct manufacturing labour costs Plant energy costs

Indirect manufacturing labour costs Other indirect manufacturing costs Cost of goods manufactured

Average unit manufacturing cost:

Finished goods stock in units:

Manufacturing costs for 100,000 units   
 Variable Fixed Total

€140,000 € €140,000

30,000 - 30,000

5,000 - 5,000

10,000 16,000 26,000

8,000 24,000 32,000

€193,000 €40,000 €233,000

€233,000 ÷ 100,000 units = €2.33 per unit

€20,970 (given) =  €2.33 per unit = 9,000 units

3 Units sold in 2005 = Opening stock + Production - Closing stock   
 = 0 + 100,000 - 9,000 = 91,000 units

Selling price per unit in 2005 = €436,800 ÷ 91,000   
 = €4.80 per unit

4 Revenues (91,000 units sold × €4.80) €436,800

Cost of units sold:

Opening finished goods, 1 Jan. 2005 € 0

Cost of goods manufactured 233,000

Cost of goods available for sale 233,000

Closing finished goods, 31 Dec. 2005 20,970 212,030

Gross margin 224,770

Operating costs:

Marketing, distribution and customer-service costs 162,850

Administrative costs 50,000 212,850

Operating income € 11,920

Note: Although not required, the full set of unit variable costs are:

Direct materials costs €1.40

Direct manufacturing labour costs 0.30

Plant energy costs 0.05 per unit manufactured

Indirect manufacturing labour costs 0.10

Other direct manufacturing costs 0.08

Marketing, distribution, and customer-service costs 1.35 per unit sold

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2.25 Revenue and cost recording and classifications, ethics. (25-30 min)

1 Concerns include:

a Total payments made by Aran Sweaters do not ‘appear’ to be adequately

described. Elements of ‘total compensation’ appear to be:

• €12 million payment to O’Neil in Achill Island

• €4.8 million payment to O’Neil subsidiary in Switzerland

• Assistance with life insurance plans for ‘O’Neil executives at rates much   
 more favourable than those available in Achill Island’

One possible motivation for restricting the payment in Achill Island to €12 million is to avoid showing higher profits in Achill Island. A second motivation could be that the Swiss subsidiary is siphoning off revenues to O’Neil senior executives, which should be paid to O’Neil. This could arise if the O’Neil Swiss subsidiary is ‘owned’ by the senior executives of O’Neil rather than being a 100% subsidiary of O’Neil.

The assistance with the insurance plans is in the grey area. If O’Neil is willing   
to accept a lower price in return for Aran Sweaters assisting with the insurance   
plans, it may be a judicious economic decision by Aran Sweaters. Aran   
Sweaters is not hurt economically in this scenario. The concern is whether Aran   
Sweaters is assisting the senior executives to divert ‘de facto’ payments to   
themselves.

b Product design costs of Aran Sweaters include €4.8 million for ‘own product   
 design’. It is stated that the director of product design views it ‘as an “off-  
 statement” item that historically he has neither responsibility for nor any say   
 about’ and that ‘to his knowledge, O’Neil uses only Aran Sweaters designs with   
 either zero or minimal changes’. It may be that the €4.8 million payment is a   
 hidden payment made to avoid Achill Island taxation. However, the result is   
 incorrect classification of product design costs at Aran Sweaters.

c O’Neil receives from Aran Sweaters the margin between €16.8 million (€12   
 million + €4.8 million) and the €3 million payment for wool,i.e. €13.8 million.   
 Note that Aran Sweaters can assist O’Neil to meet the 25% ratio of ‘domestic   
 labour costs to total costs’. Charging €6.00 million for wool and receiving   
 €19.8 million for sweaters will result in the same €13.8 million margin, but will   
 mean O’Neil will not meet the 25% test as total costs will now be €13 million   
 instead of €10 million. Aran Sweaters has to ensure it takes an arm’s-length in   
 its approach to supply contracts and purchase contracts or else it may be   
 accused by the Achill Island government of assisting O’Neil to avoid local   
 taxes.

*Note*: Some students will ask whether O’Neil should be able to classify labour fringe   
benefits as a domestic labour cost. This is not Sheridan’s domain given that she is   
controller of Aran Sweaters. Her concern with the Achill Island tax rebate is whether   
Aran Sweaters is being ‘pressured’ to adjust its billing amounts to facilitate O’Neil to   
have a ratio of ‘domestic labour costs to total costs’ exceeding 25%. If you want to   
discuss this issue, point out that labour fringe benefits are typically an integral part of

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labour costs. Hence, if they can be traced, O’Neil is justified in including them in domestic labour costs.

2 There are a variety of ethical issues relating primarily to competence and integrity   
 that Sheridan faces:

a Is Aran Sweaters assisting O’Neil to avoid income taxes in Achill Island either:

• by funnelling €4.8 million to a Swiss company rather than to O’Neil in   
 Achill Island, or

• by understating both the €3 million wool supply cost and the €16.8 total   
 revenue amount?

b Is Aran Sweaters assisting senior executives of O’Neil to enrich themselves at   
 the expense of the shareholders of O’Neil?

c Are the accounting records of Aran Sweaters properly reflecting the underlying   
 activities?

3 Steps Sheridan could take include:

a Seeking further information on why the €4.8 million payment is being made to   
 the Swiss subsidiary. This should be done first internally and then by speaking   
 to O’Neil executives.

b Ensure product design costs at Aran Sweaters reflect actual product design   
 work. So-called ‘off-statement’ items should be eliminated if no adequate   
 explanation can be given for them.

c Ensure Aran Sweaters personnel follow any company guidelines about supply   
 relations or customer relations. There is nothing inherently wrong with assisting   
 O’Neil negotiate a better insurance package for its executives. The concern is   
 whether developing a ‘too cosy’ relationship will lead to more questionable   
 practices being overlooked.