

## CHAPTER 1

# Foundations of management accounting

## Answers to Exercises

### **Exercise 1.1 Current management accounting practice**

a. Many professional management accounting journals are available for this exercise. Continuously new journals are being launched and old journals disappear, it is therefore difficult to provide a complete and updated list. Some of the best well-known journals are the following:

**Financial Management:** published by the Chartered Institute of Management Accountants (CIMA) in the UK ([www.fm-magazine.com](http://www.fm-magazine.com)).

**Strategic Finance:** monthly magazine published by the Institute of Management Accountants (IMA) in the US.

**Management Accounting Quarterly:** a refereed online journal published by IMA ([www.imanet.org/resources\\_and\\_publications/management\\_accounting\\_quarterly/](http://www.imanet.org/resources_and_publications/management_accounting_quarterly/)).

**Accounting Today** and **Practical Accountant:** both published by WebCPA, an Accountant Media Group news site.

**Management Accounting Quarterly:** a scholarly journal offered online by the Institute of Management Accountants.

**The Compass:** an online journal published by The American Society of Women Accountants (ASWA, website [www.aswa.org](http://www.aswa.org)).

**CFO Magazine:** a subscription-only magazine put out by CFO Publishing ([www.cfo.com](http://www.cfo.com)).

**CMA Magazine:** published by the Society of Management Accountants of Canada ([www.cmamagazine.ca](http://www.cmamagazine.ca)).

b. Most of the topics covered in professional management journals appear to be related to the familiar topics, like cost measurement, cost allocation, performance measurement, transfer pricing and investment analysis. Attention can be devoted to questions such as:

1. To which category of management accounting techniques does the current topic belong?
2. When was the technique developed for the first time?
3. What was the reason for its initial development?
4. What is the reason that it is discussed in the press? What is new?
5. How does the renewed interest in the topic deviate from the past?

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### **Exercise 1.2 Current management accounting research**

a. The following scholarly journals can be used in this exercise:

- Management Accounting Research (UK)
- Journal of Management Accounting Research (US)
- European Accounting Review
- The Accounting Review
- Contemporary Accounting Review
- Behavioural Research in Accounting
- Journal of Accounting and Economics
- Accounting, Organisations and Society
- Review of Accounting Studies
- Accounting Horizons
- Journal of Business, Finance and Accounting
- Journal of Accounting Literature

- Accounting and Business Research
- Financial Accountability and Management
- Journal of Applied Management Accounting Research
- Journal of Accounting and Organisational Change

b. Most of the topics covered in academic management accounting journals appear to be related to the familiar topics, such as cost measurement, cost allocation, performance measurement, transfer pricing and investment analysis. Attention can be devoted to questions such as:

- To which category of management accounting techniques does the current topic belong?
- When was the technique developed for the first time?
- What was the reason for its initial development?
- What is the reason that it is discussed in the press? What is new?
- How does the renewed interest in the topic deviate from the past?

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### **Exercise 1.3 Lyman Mills cost accounting practices**

a. The deviation with current accounting practice lies in that unexpired factory labour and overhead costs are not charged to inventory, but were directly charged to the mill accounts (one for coarse goods production and the other for fine goods production). This makes them irresponsive to fluctuations in production activity level and inventory depletion.

b. In periods of low production volumes and high sales this would lead to the overstatement of profits, whereas in periods of low sales in combination of high production volumes this would lead to understatement of profits.

c. The differences are not very large for two reasons:

1. The production numbers are relatively stable over time, causing the longer-term profit deviations to cancel out.

2. The relative share of manufacturing payroll and factory overhead in total production costs is relatively small, because of the high prices for cotton. This makes direct material costs by far the largest cost component in total manufacturing cost.

### **Exercise 1.4 Markets versus hierarchies**

a. The main reasons for merchants to bring their market-based contractual relations into a hierarchical organisation, based on wage-contracts, are the following:

1. The increase in market demand in Western Europe motivated the merchants to increase production. Expanding the number of artisans contracted involved a lot of additional travelling, contracting and control efforts which is not very economical. This reflects high transaction costs, which merchants try to avoid.

2. Offering higher prices for more output frequently motivated artisans to produce less and relax more. This phenomenon is known as *moral hazard* in agency theory. An alternative is to install a hierarchical relationship that allows merchants to impose production requirements in exchange for a (fixed) compensation.

b. Yes. Market failures can be found in *transaction cost economics* and especially because of the existence of information asymmetry between exchange partners. This can be aggravated by opportunistic behaviour, small number exchanges and complexity/uncertainty surrounding the transaction.

*Agency theory* looks at opportunistic behaviour of contract partners, which may lead to adverse selection (choosing the wrong contract or contract partner) or moral hazard (finding legal and also illegal ways to benefit from the contractual relationship).

c. This is not necessarily the case. When market-based contractual arrangements are replaced by hierarchical relations, new problems may occur. Most problems are related to

dysfunctional behaviours of employees, and control costs (costs of drawing up labour contracts, monitoring and correcting behaviour and performance).

d. Please refer to answers under a–c.

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### **Exercise 1.5 The industrial revolution**

a. The market at the time primarily valued low prices. Carnegie's strategy was to only innovate production technology when it led to lower production costs, which left him to control direct production costs (material and conversion costs).

b. Carnegie appeared to have an eye for different strategically important business aspects. He had intimate knowledge of production processes (production control), knew his customers' needs from personal connections with his clients (market knowledge), and strived to continuously improve product quality (quality improvement).

c. Two innovative management accounting methods were stimulated by the Scientific Management Movement:

1. Standard costing was used to define and control the amount of labour and materials required for a unit of output. This could be set by analysing the type and number of production activities required for the production of a unit of output. Scientific management aimed at defining and optimising the elementary production activities required for the output being produced.

2. Variance analysis was developed to monitor and control the deviations between the optimal production activities set after the analysis of elementary production activities, and the production output realised at the end of the period.

### **Exercise 1.6 Pierre du Pont's financial ratios**

a. Use the following formula:  $ROI = (\text{Margin on Sales}) \times (\text{Rate of Capital Turnover})$ , or in formula:

$$\begin{array}{l} \text{Net profit} \\ ROI \qquad \qquad \qquad \text{Sales} \\ \text{Sales} \qquad \qquad \qquad \text{Capital Investment} \\ = \cdot \end{array}$$

For standard volume:

$$ROI = (6,500,000/50,000,000) \times (50,000,000/32,500,000) = 0.13 \times 1.538 = 0.20.$$

b. Some costs are direct costs, which have a direct relation with the production level. These relationships do not change when sales numbers change, for instance cost of sales and variable commercial expense. Another element that may be directly related to the activity level of the firm is working capital (current assets – current liabilities).

c. This formula is invented by Donaldson Brown. He wanted to have a quick and easy-to-use formula to reconstruct the return on investment needed under different production and sales volumes in order to attain the long-term return on investment required. This long-term investment was fixed at a standard volume, which was normally fixed at around 80% of technical maximum capacity. In Figure 1.1, the standard volume is 40,000 (80% of technical capacity of 50,000 units).

The reason for Brown to reconstruct the required rate of return under different volumes was his need to quickly and easily detect if other disturbances were acting which were not dealt with by local management, such as changes in prices, costs, operating efficiency, factor prices and the like.

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The denominator of the formula is divided into two parts: c (the ratio of working capital to sales) and d (the ratio of fixed investment to sales). The first one is a variable to volume,

that latter one is an invariant to volume fluctuations. At lower volumes, d needs to be corrected upwards to get the new ratio, which can be done by dividing it by the ratio of actual volume to standard volume m. In this example: when the actual volume is 30,000 instead of 40,000 the m is 0.75. Adjusting the ratio of Fixed investment to sales is therefore done as follows:  $0.30/0.75 = 0.40$ .

The numerator of the formula is also divided into part variables: b (the ratio of net profit to sales) and a (the ratio of fixed factory costs and commercial expenses to sales). The factor b contains both annual sales variable costs and fixed costs. The fixed costs cause this factor to become lower. The correction can then be included on these costs by taking a and reconstruct the required ratio under normal capacity by reducing it by  $(m - 1/m = -0.25/0.75 = -0.33)$ . Note that if the standard volume is used, this term would be zero. Not only variable costs but also fixed costs are included in b and set at normal capacity.

Let's do the math here for  $\times(30,000)$  based on the ratios for the standard volume:

7,30,000 0.75 1

0.13

50,000,000

0.30

0.35

0.75

{

}

+

0.75 0.13 0.146 0.33 0.08182

10.9%

) - .

== =

0.75

[ ) -

x

=

0.75	

+ · The small difference with Figure 1.1 is due to rounding errors.

d. Suppose the norm would be changed to 20% under lower volumes, the division could decide to increase prices, efficiency or lower costs of material, labour, working capital or investments.

### **Exercise 1.7 DuPont based variance analysis**

a. The DuPont chart analysis could look similar to the following:

Although both divisions have the same return on investment of 20%, they also have marked differences. Division B has a higher ROS, mainly because the division has lower factory and selling costs. Division A has a higher investment turnover because they use lower

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capital per sales dollar. The lower capital cost is reached by lower working capital, mainly

caused by lower inventory levels, cash and receivables.

b. Candidates for improvement are:

1. Reduction of factory costs, including costs of sales and selling costs
2. Reduction of capital costs, including working capital and cost of fixed assets
3. Increase of sales.

### **Exercise 1.8 Different costs for different purposes**

1. Financial consequences can be shown by calculating net cash flows for each alternative (see Exhibit 1). Purple Star turns out to be the most attractive option, followed by Blue Elegance

and Green Delight.

### **Exhibit 1: Fashion House Couturiers: choosing a product**

#### **Cash flows Purple Star Green delight Blue elegance**

Cash outflows €32,000 €44,000 €60,000

Sales numbers 140 120 110

Dress prices €300 €400 €600

Cash inflows €42,000 €48,000 €66,000

Net cash flow €10,000 €4,000 €6,000

2. In our cash flow analysis, we only take into account cash flows that may change because of the alternative we choose. This means that the costs for market research (€20,000) and for the computer system (€14,000) are excluded from the analysis. The costs of market research are *sunk costs*: they have already been incurred and will not change because of the future design choice. The costs of the computer system are *fixed costs* and will not change because of the productive use. Both costs have in common that they have been incurred anyway and that they will not change whichever design we would select.

3. The opportunity cost is calculated in two different forms (see also Exhibit 2):

□ The *incremental opportunity cost approach*: the opportunities are compared to the best possible alternative and only incremental net cash flow gains and losses are reported.

The selection criterium is to choose the option with zero incremental costs. The outcome of this option obviously cannot be improved by choosing an alternative option.

□ The *comprehensive opportunity cost approach*: opportunity costs/benefits are added to the outcome of the option. For instance, the net cash flow of Purple Star cannot be improved by choosing an alternative design. The second best choice (Blue Elegance) leads to a reduction of net cash flow by 4,000 and the third option (Green Delight) to a reduction of €6,000. Adding opportunity costs to the cash flow outcomes does not change the ordering of the alternatives, but increases the differences between the alternatives.

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#### **Additional reading:**

Arnold, J.A. and Scapens, R. (1980). 'The British contribution to opportunity cost theory. In M. Bromwich and A. Hopwood (eds.), *Essays in British Accounting Research* (pp. 155–173). London: Pitman.

Ezzamel, M. and Hart, H. (1987). *Advanced Management Accounting: An Organisational Emphasis*. London: Cassell Educational Limited.

### **Exhibit 2: Fashion House Couturiers: opportunity cost calculations**

#### **Cash flows Purple Star Green delight Blue elegance**

Cash outflows €32,000 €44,000 €60,000

Sales numbers 140 120 110

Dress prices €300 €400 €600

Cash inflows €42,000 €48,000 €66,000

Net cash flow €10,000 €4,000 €6,000

Best alternative difference €4,000 €6,000 €4,000

Incremental opportunity cost €- €6,000 €4,000

Comprehensive opportunity cost €10,000 €2,000 €2,000

4. The opportunity cost of doing nothing is the net cash flow of the best alternative, which is €10,000.

5. Purple Star.

### **Exercise 1.9 Management control models**

a. The strong points are the following:

1. The cybernetic model lists systematically all functions that need to be available in order to reach effective control over an object.
2. Over the years that this model has been used, it became clear that it helped managers rethink whether all functions are working properly, i.e. goal setting, monitoring, evaluation and changing behaviour.
3. Anthony's control system positions each function relative to the other functions: first, goals need to be set before monitoring can take place, then evaluation and finally altering behaviour.

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b. Weaker points of the cybernetic control system:

1. The cybernetic control system works reasonably well in technical systems, where we know what effects control activities will generate.
2. Real-life organisations however do not react predictably to control actions. Organisations are composed of individuals, and each individual may react differently to the control system.
3. Organisations also contain groups of individuals. Groups create group behaviour that may not be anticipated by the designers of control systems.
4. Both individual and group behaviour make organisations much more complex and unpredictable than technical systems are. For this reason, designing a control system for (parts of) organisations is much more complicated and requires not only technical know-how of production and logistic systems, but also knowledge of psychological and sociological processes and interactions.