

Examination guidelines HFIN 4230: Cost Accounting

Guideline based on Lectures Spring Semester 2019

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Intention with the course: To focus on the relevance of institutional and clinical characteristics in health care services when doing accounting, starting with clinical examples and building knowledge for system upwards. Illustrate how standard economic principles and methods are fully relevant to health services, but with proper adjustments compared with industry.

The following guidelines should not be perceived as a distinct and absolute blueprint for the exam, but as an example of main topics of importance. The intention with exam questions was to give candidates opportunity to show their knowledge, maturity in a broad perspective and skills of presenting.

An excellent response requires both presenting definitions and examples showing basic understanding of terms.

Question 1. (20 %)

Explain the following terms:

a. Relevant and irrelevant costs.

When doing accounting as a support for decision making, it is important to differ between costs that may be influenced by the decision and those who are not.

Relevant costs: Those costs that will be influenced by a given decision

Irrelevant costs: Costs that will not be influenced by a future decision; should not be an element in the decision making; they are per definition the same whatever decision is made.

- Past costs (sunk costs) not relevant
- Allocated indirect fixed costs may also be irrelevant: support, not production?
- Unavoidable costs are those that will occur to the same extent independently of the decision done, whereas avoidable costs may be eliminated or strongly modified by a given decision.

Give some examples to illustrate candidate's understanding of relevance.

b. Direct and indirect costs.

All costs in a production must be allocated to a cost object/product/service to cover expenses.

Direct costs are costs that may be directly related to a product or a service.

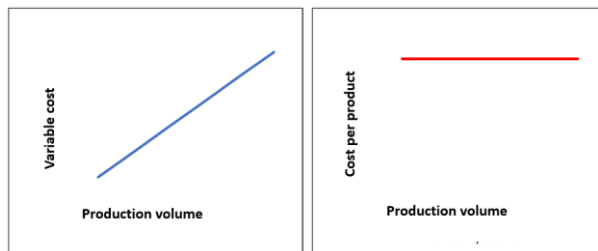
Present some examples: raw material expenses for a product, direct labor costs that can be specifically identified with a particular cost object, for example production or mounting of a product.

Similarly, medications and other medical substances used in patient treatment may possibly be associated directly with each treatment episode. Also, the direct labor costs for a medical treatment (surgeon doing a procedure) are costs of the staff involved in the treatment actions and which may be assigned specifically to that medical department/treatment. However, there are numerous examples that allocating costs to each patient as a cost object may be extremely complex and therefore consuming.

Indirect costs cannot be identified exclusively to a given cost object. They may consist of labor costs and expenses from other parts of a production, for example the wages of employees whose time cannot be specified for each product; provision of an internal service, managing, accounting, services that will be engaged in multiple perspectives of the establishment, lighting and heating expenses, property taxes and transport that are related to multiple services. Allocated by proper cost drivers. Possibly illustrate with figure.

c. Variable costs.

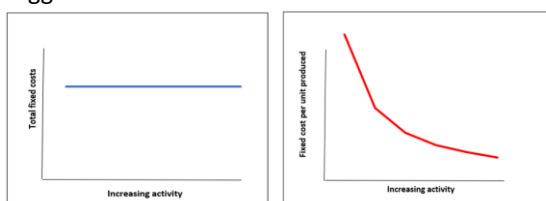
Variable costs are those that vary in proportion to the activity volume. For example, doubling a production may double the costs for raw material (not considering discount on increased batches of procurement). Differing activity volumes may also influence the labor time and thereby labor cost. Variable costs increase with increasing activity, but the cost per product is usually constant. Suggested illustration:



d. **Fixed costs.**

Fixed costs; may remain unchanged over a wide range of activity for a given time window. Not affected by changes in activity; exemplified by administrative salaries, depreciation of equipment, property taxes, insurance costs and salary costs for services not related to the activity. May possibly not stay fixed for any condition and for every time perspective. It may be limited to a certain span of activity, time period and so on.

Suggested illustration:



Question 2. (30%)

a. **What is the principle of a cost-volume analysis in a manufacturing system?**

Explain what relevant range means.

A cost-volume analysis illustrates the relation between costs and revenues as a function of volume of production/activity.

Explain break-even point, conditions that define relevant range, and time factors.

Assumptions on which cost-volume-profit analyses are based; variables other than volume remain fairly constant, the sales mix, costs can be accurately divided into their fixed and variable elements.

Relevant range: defined as the interval where total costs (and usually revenues) are linear functions of volume. Relevant range must be defined by analyzing the extent of linearity of costs versus volume; and the point where linearity is no longer valid is end of relevant range. Care required in interpreting CVP relationships outside the relevant range where variable costs are no longer deemed to be constant per unit (because limit for relevant range defined before this point), and results obtained from conditions that fall outside the relevant range may be different.

b. **You are supporting a clinical manager in a surgical unit. There is a situation where you are asked to do cost simulations of increased activity, but there is uncertainty of how costs will change and whether increased revenues will cover them because there are multiple personnel groups involved in the clinical activities.**

Explain how the principles of cost-volume in a) may be used, and in particular, discuss how such a unit may behave different from a manufacturing system.

Multiple aspects may be relevant to discuss. Although this is left to the candidate's discretion, it should contain some of the following topics (but all not mandatory and others may be relevant):

Revenues: If existing financing is block grant, is the upcoming extra reimbursement covering costs with no block grant? May not always be so, depends on costs from increased activity and C-P analysis useful. Long time – short time - important to remember, for example lower reimbursement for day-surgery?

Complex resource mix.

In health services, salary costs constitute 60 %. Some are distant to "production" (administration, services etc.) whereas the salary costs (and other costs) associated with treatment activities may vary

considerably if activity increase. Within own unit, involvement of multiple resource/personnel groups; some resources may be within relevant range, others outside. Therefore; usually consider multiple "relevant range" models.

A given clinical unit may be able to increase activity and make profit within own relevant range, but must consider that possible serving departments they influence with increased demand for services may actually differ. The surgical unit may be well inside their own relevant range (costs fairly linear to activity) but other units may be close to limit/outside their relevant range and face considerable increases in costs with increased service. Such consequences may also incur that such a unit may not be able to provide needed services, blocking for expected increase services to increase own activity.

Question 3 (50%)

Decision making in strategic planning.

- a. (50% of question 3). Present some statements in a macro perspective for the following situation:

You are going to assist a clinical manager in a three months process where a revised strategy of the clinic is going to be defined. They are considering a wide perspective for their future activities; changing/adjustments of patient services, options to establish new activities, discontinuation of current services. The leader has given you freedom to suggest all relevant perspectives you can imagine may be of interest.

For this exam question in particular, there is no "blue print" and the intention was to let the candidate create a small essay showing his/her overall understanding and knowledge of economic topics and developments related to health services; both focus on accounting topics and health care topics. Previous exam Questions 1 and 2 are relevant, contain some important topics.

Evaluation of Exam question 3 is based on the logic and educational buildup of the candidate's presentation, content, reflection, asking questions? Part a) and b) are evaluated as a context to ensure that candidate's total performance has been fairly scored.

Economy.

Accounting is one of the cornerstones of the management decision making and should contribute to; know where you are, where you want to go, follow up the course to see if you get there, do proper adjustments if not.

Analysis may include differing perspectives; current finances, personnel recruitment and costs, current infrastructure/equipment and so on, future demand, future financing.

Some topics related to history:

The medical development related to the clinic. Special challenges in past and current?

Meet future demands differing from today? What are motives for revision? Improvement?

Management

Level of leadership? Administrative/bureaucratic leader or including leader?

Cultures in the medical environment.

Capacity

Current status: Capacity, recruitment of personnel, infrastructure, excellence of services – some needs improvement?

Some topics related to future:

New treatments coming up? New demands coming up? (increase/decrease). New technologies for existing treatments? How long is the relevant period?

How will public financing develop? More or less activity based? More or less targeted financing (for selected patient groups).

How will the recruitment of crucial personnel develop?

Whereas an important issue for a manufacturing company is to identify the goals and major objectives related to gain new market shares or increase profitability, to be exclusive within market branches and so on, a health institution's main ambition is usually being preferred provider of certain services, focus on some particular new patient groups, or to implement new treatment modes or techniques. But the issue will be the same; document and define the current situation and analyze differing future alternatives.

Overall institutional perspectives

The clinic is part of a hospital – must be in line with institutional goals!

- b. (40% of question 3), What are some of the most important elements you have learned from the theory of decision making, that you consider important in your contributions to the manager.

Situations of uncertainty

Decision making is often related to situations where several factors are unknown; probably relevant in current example.

The management may be left with the consideration; what is most likely to happen?

Analyze alternatives for the future; it may be necessary to choose between mutually excluding patient groups/treatments? Principles from opportunity costs.

Analyze future factors within own control and those who are not.

When follow up; measure the course to see if you get where intended, proper adjustments if not.

What are relevant deviations from course – what is within acceptable limits? Statistical tools to evaluate?

Observe the important balance between economy and quality factors; competence, skill mix, accessibility of services.

- c. (10% of question 3). A special element in decision making is when restrictions of resources apply. (reference is made to the lecture where we did some basic calculations).

Consider a radiology clinic which has specialized in MR services. They give service all 5 weekdays from 8 a.m-18 p.m. They have three radiologists (physicians specialized in radiology) at their disposal who work on demand (i.e. as much as requested, no restrictions). All three radiologists are competent to interpret all the MR procedures that the clinic performs (fully exchangeable). They have 2 MR machines and they do MR imaging of heart patients, knee pain/injury patients, and patients with back/spine pain. The following data are available:

MR examination of heart patients; each procedure consumes 35 minutes of a radiologist interpreting the studies and 60 minutes of imaging time (MR machine time).

MR of knee patients; 10 minutes radiologist time and 8 minutes imaging time.

MR of back/spine: 15 minutes radiologist time and 15 minutes imaging time.

The payment that the clinic charges for the procedures are:

MR Heart: 6 500 NOK, MR Knee 1 420 NOK, MR Back/Spine 1 800 NOK.

You have been asked to advice on the optimal mix of these procedures. How do you analyze? What do you consider important perspectives?

The crucial principle is to identify those products/services that yield the largest contribution per limiting factor, and this may be related to hours of technical resource, area of production, personnel hours and more.

In the actual case: Maximum 100 hours MR scanning/week=restriction, radiologists on demand (not restricted).

Resource	Heart	Knee	Back/Spine
Income/procedure	6 500	1 420	1 800
Radiologist time	35	10	15
Contribution/radiologist hour	11 143	8 520	7 200
Ranking by radiologist time	1	2	3
Imaging time	60	8	15
Contribution/scan hour	6 500	10 650	7 200
Ranking by MR scan time	3	1	2

Full score on this exam question if:

Concluded one scarce factor = MR imaging time. "Profit maximizing would be to only do knee patients".

But; then discuss quality factors not assessable from economic calculations alone:

Is there a sufficient demand to focus only one patient group?

Long term competence of staff influenced negatively or positively?

Will physicians be willing to do only one type? Reputation doing only one?

Several candidates have scored on describing other aspects:

- Replacement of equipment?
- Outsourcing?
- Discontinuation?