ISCTE IUL
Instituto Universitário de Lisboa

Accounting Department

THEORETICAL LESSON 5

Production processes and Joint Production

MANAGEMENT ACCOUNTING I

Management

2014/2015 – 2nd semester

Objectives of the LESSON [1/2]

i. Classify the production processes

ii. Characterize the process of joint production

iii. Identify the products obtained under the process of joint production

Objectives of the Lesson [2/2]

iv. Allocate the joint costs to by-products and scrap

v. Allocate the joint costs to the main products

vi. Constraints of the unit manufacturing costs ascertained in joint production for decision-making

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Objective 1

i. Classify the production processes

Production Processes

- According to the greater or minor complexity of the production processing, the production process may be simple or complex.

Simple:
The production processing consists of a unique conversion operation.

Example: making bread after the purchase of the dough.

Complex:
The production processing consists of several conversion operations.

Example: furniture manufacturing.

Production Processes

- According to the possibility of identifying the product during the production processing, the production process can be continuous or discontinuous.

Continuous:
it is not possible to identify the product over the course of processing.

Example: cement manufacturing.

Discontinuous:
it is possible to identify the product over the course of the processing.

Example: furniture manufacturing.

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Production Processes

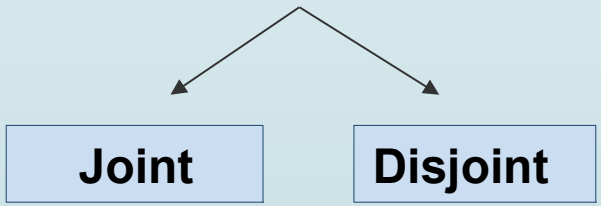
- According to the number of products manufactured, the production processes can be unique (uniform) or multiple.

Unique (or uniform):
the production process causes a unique product.

Example: chairs manufacturing.

Multiple:
the production process causes several products.

Example: chairs and tables manufacturing.



Production Processes

Multiple production process (or multiple manufacturing):

JOINT:
from the conversion of the same raw materials and through the same manufacturing processes several products are simultaneously obtained.

Example: production of oil and marc (bagasse) from the olive, production of ethyl and denatured alcohol from vinic brandy, etc.

DISJOINT:
from the conversion of the same or different raw materials and through different manufacturing processes several products are obtained.

Example: manufacturing of chairs and tables from wood, making bread from wheat flour, etc.

Objective 2

ii. Characterize the joint production process

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Joint Production

Split – off Point

1st Stage:

... to obtain simultaneously diverse products

Joint or common costs to all products obtained.

How to allocate these joint costs? Which criteria?

2nd Stage:

... after obtaining simultaneously the products

Specific costs of each product.

Objective 3

iii. Identify the products obtained in the joint production process

Joint Products

According to their relative importance (selling price), the joint products can be:

Main products (or co-products):

… constitute the main objective of the production process

Example: the ethyl and denatured alcohol in the conversion process (rework) of brandy.

By-products:

… do not constitute the main goal of the production process

… are obtained complementarily with the main products

… have selling price/value

Example: brans in the conversion process of wheat into flours.

Scrap:

… does not constitute the main goal of the production process

… are obtained complementarily with the main products and with the by-products

… may or may not have selling pricr/value

Example: iron filing in the conversion process in the metal mechanics industry.

Objective 4

iv. Allocate the joint costs to the by-products and scrap

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By-products and Scrap

Joint costs of the **by-products** → **Profit Nil** → **Costs allocated = Selling value** (of production) **– specific costs** (manufacturing and non-manufacturing)

i.e. Profit of the sale of production = 0

Joint costs of **scrap** → **Profit Nil** (with selling value) → **Costs allocated = Selling value** (of production) **– specific costs** (manufacturing and non-manufacturing)

i.e. Profit of the sale of production = 0

Joint costs of **scrap** → **Cost Nil** (no selling value) → **No joint costs are allocated.** They are to the main products

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Example

A company takes up wheat milling. Two flours (F1 and F2) and brans are obtained. The flours are packed, stored and sold in bags and the brans are sold in bulk.

Data of the month X:

Production:

F1 - 800 tons

F2 – 1 000 tons

Brans – 200 tons

Sales:

F1 - 600 tons at 400 €/ ton

F2 – 1 000 tons at 350 €/ton

Brans – 200 tons at 20 €/ton

Manufacturing costs:

Wheat – 120 000 €

Milling – 64 000 €

Packing – 27 000 €

FP Warehouse – 13 500 €

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Example

Solution:

- Joint costs to allocate to the joint products:

  Joint costs = 120 000 € + 64 000 € = 184 000 €

- Sales value (of the production) of the brans:

  Sales value = Production x Selling price – Specific costs

  = 200 tons x 20 € - 0 = 4 000 €

- Joint costs to allocate to the brans = 4 000 €

- Unit manufacturing cost = 4 000 € / 200 tons = 20 €

Objective 5

v. Allocate the joint costs to the main products

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Main Products

- The most used criteria to allocate the joint costs to the main products are:

I. Quantities produced

II. Sales value of production or potential sales value

III. Net realizable value (Sales value of production at the split-off point)

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I. Quantities Produced

- According to this criterion, the joint costs to allocate to the main products are proportional to the quantities produced.

Example:

Joint costs deducted from those previously allocated to the by-products:

120 000 € + 64 000 € - 4 000 € = 180 000 €

Quantities produced:

F1 - 800 tons

F2: 1.000 tons

- Percentage of F1 in the total of the quantities is 44.4(4)% and the one of F2 is 55.5(5)%.

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I. Quantities Produced

The **joint costs** to allocate to the main products are:

F1: 180 000 € x 44.4 (4) % = 80 000 €
F2: 180 000 € x 55.5 (5) % = 100 000 €

- The specific manufacturing costs of each flour, packing and storage are added to the joint costs allocated to each type of flour.

- In the example: it is assumed that the specific costs of packing and storage are manufacturing and that they are allocated to the two flours in the proportion of the quantities produced.

I. Quantities Produced

- The allocation of the specific manufacturing costs to both flours is the following:

Packing: 27 000 € / 1 800 tons = 15 €/ton

F1 – 800 tons x 15 € = 12 000 €

F2 – 1 000 tons x 15 € = 15 000 €

Storage: 13 500 € / 1 800 tons = 7.5 €/ton

F1 – 800 tons x 7.5 € = 6 000 €

F2 – 1 000 tons x 7.5 € = 7 500 €

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I. Quantities Produced

The unit, global and manufacturing costs are:

F1:

Joint costs:	80 000
Packing:	12 000
Storage:	6 000
	98 000 €

Unit manufacturing cost =

98 000 / 800 tons = **122.5 €**

F2:

Joint costs:	100 000
Packing:	15 000
Storage:	7 500
	122 500 €

Unit manufacturing cost =

122 500/1 000 tons = **122.5€**

I. Quantities Produced

Disadvantages:

- It can only be used, if the production of the main products can be expressed in the same physical unit.
- It does not take into account the market value of each product and the differences of market price between the main products.
- The products have the same unit cost regarding the joint costs.

II. Sales Value of the Production or Potencial Sales Value

- According to this criterion, the joint costs to allocate to the main products are proportional to the sales value of the production.

Example:

Joint costs after previous deduction of those ones allocated to the by-products:

120 000 € + 64 000 € - 4 000 € = 180 000 €

Sales value of F1: 800 tons x 400€ = 320 000€

Sales value of F2: 1 000 tons x 350€ = 350 000€

- Percentage of F1 in the total of the sales is 47.8% and of F2 is 52.2%.

II. Sales Value of the Production or Potential Sales Value

The **joint costs** to allocate to the main products are:

F1: 180 000 € x 47.8 % = 86 040 €

F2: 180 000 € x 52.2 % = 93 960 €

- The specific manufacturing costs of each flour, packing and storage are added to the joint costs allocated to each type of flour.

Packing : 27 000 €/1 800 tons = 15 €/ton

F1 – 800 tons x 15 € = 12 000 €

F2 – 1 000 tons x 15 € = 15 000 €

Storage: 13 500 €/1 800 tons = 7.5 €/ton

F1 – 800 tons x 7.5 € = 6 000 €

F2 – 1 000 tons x 7.5 € = 7 500 €

II. Sales Value of the Production or Potential Sales Value

- The unit, global and manufacturing costs are:

F1:

Joint costs:	86 040
Packing:	12 000
Storage:	6 000
	104 040 €

Unit manufacturing cost =

104 040 / 800 tons = **130.05€**

F2:

Joint costs:	93 960
Packing:	15 000
Storage:	7 500
	116 460 €

Unit manufacturing cost =

116 460/1 000 tons = **116.46€**

II. Sales Value of the Production or Potential Sales Value

Advantage:

- In the allocation of the joint costs to the main products it already takes into account the market value.

Disadvantages:

- It does not take into account the distinct weight of the specific costs of each product.

- It should be used when the specific costs are not significant and/or easily ascertainable.

III. Net Realizable Value (Sales Value of the Production at the Split-off Point)

- According to this criterion, the joint costs to allocate to the main products are proportional to the sales value of the production deducted from the specific manufacturing and non-manufacturing costs (or sales value of the production at the split-off point).

Example:

Joint costs after previous deduction from the costs allocated to the by-products:

120 000 € + 64 000 € - 4 000 € = 180 000 €

Sales value of the production at the split-off point:

F1: (800 tons x 400€) – (800 tons x 15€) –

(800 tons x 7.5€) = 302 000€

III. Net Realizable Value (Sales Value of the Production at the Split-off Point)

F2: (1 000 tons x 350€) – (1 000 tons x 15€) – (1 000 tons x 7.5€) = 327 500€

- Percentage of F1 in the total of sales at the split-off point is 48% and the one of F2 is 52%.

The **joint costs** to allocate to the main products are:

F1: 180 000 € x 48 % = 86 400 €

F2: 180 000 € x 52 % = 93 600 €

III. Net Realizable Value (Sales Value of the Production at the Split-off Point)

- The specific manufacturing costs of each flour, packing and storage are added to the joint costs allocated to each type of flour.

Packing: 27 000 €/1 800 tons = 15 €/ton

F1 – 800 tons x 15 € = 12 000 €

F2 – 1 000 tons x 15 € = 15 000 €

Storage: 13 500 €/1 800 tons = 7.5 €/ton

F1 – 800 tons x 7.5 € = 6 000 €

F2 – 1 000 tons x 7.5 € = 7 500 €

III. Net Realizable Value (Sales Value of the Production at the Split-off Point)

The unit, global and manufacturing costs are:

F1:

Joint costs:	86 400
Packing:	12 000
Storage:	6 000
	104 400 €

Unit manufacturing cost =

104 400 / 800 tons = **130.50€**

F2:

Joint costs:	93 600
Packing:	15 000
Storage:	7 500
	116 100 €

Unit manufacturing cost =

116 100/1 000 tons = **116.10€**

Objective 6

vi. Constraints of the unit manufacturing costs ascertained in joint production for decision-making

Constraints

- The unit manufacturing cost of the products in the joint production process depends on the criteria used in the allocation of the joint costs.

- To make the decision to sell or not sell, the sales value of all joint production should be compared to all joint costs; not the market price of each joint product to the respective unit costs.

End of Theoretical Lesson 5