

ACCOUNTING OF INCOMES RELATED TO COST OF PRODUCTION IN PROGRESS

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Abstract: Incomes related to production in progress are not incomes generating revenue money in a near-future period; as a source of virtual enrichment for the enterprise, they are measured, for reasons of prudence, to the level of costs of production. At the level of principle, we can discuss the means to separate costs related to the finished production from those related to the production in progress, a particularly thorny issue encountered in practice and which, in most cases, determines the productive entities either to drop the actual determining of production costs or to make an improvised calculation. In our opinion, the problem is not the method of accounting the incomes associated with the cost of production in progress, but the way of evaluating the production obtained and stored, especially when both finished goods and goods in process are obtained.

Keywords: income, stocks, costs evaluation, cost of purchase, cost of production, direct costs, indirect costs, finished goods, goods in process.

In full agreement with the opinion of C. Staicu et al. (2010)¹, the production activity of any economic entity is reflected on the one hand, in various material assets, which are reflected in the accounts corresponding to their nature, existing in the stock accounts class (3), and on the other hand, in incomes related to this production obtained and delivered to the warehouse (deposit) of the entity, for storage (keeping) until recovery to customers, as well as to the unfinished production at the end of the period, which **in our opinion outlines the aspect of variation of stocks.**

Thus, changes in stocks of finished products can represent a plus (in case of storage, when the final stock is greater than the initial stock) or minus (in case of shortage when the final stock is lower than the initial stock). In other words, the income from stock variation is calculated as the difference between the value of the production cost of stocks of products and goods in process at the end of the period and the initial value of these stocks, without taking into account the provisions made for impairment.

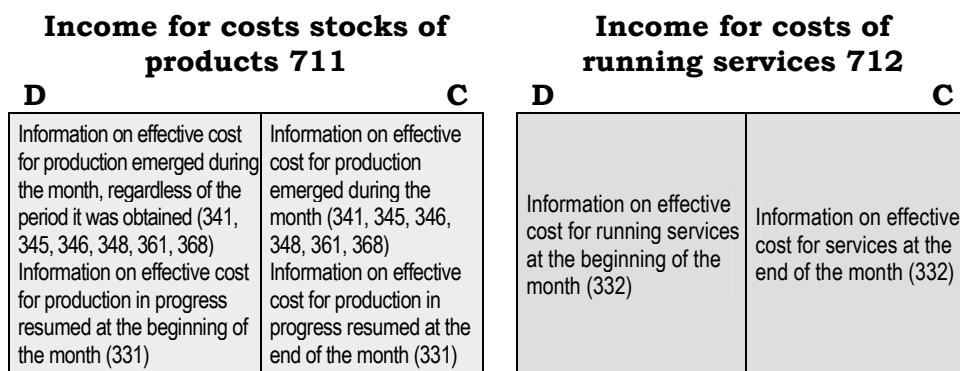
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¹ Staicu C. et al, *Contabilitate financiară. Abordare în context european și internațional*, Editura Universitaria, 2010, p. 128.

The variations of stored goods are determined for each form of stored products (finished products, semi-finished products, waste) as well as for the production in progress. **Incomes related to the cost of production in progress are not incomes generating revenue money in a near-future period; as a source of virtual enrichment for the enterprise, they are measured, for reasons of prudence, to the level of costs of production.**

Revenues from production stored influence the final outcome of the activity, enrolling in the profit and loss account with a plus or minus sign as shown as a balance in hand and respectively balance due.

What OMFP 3055/2009 brings new is that it separates the incomes related to costs of products stocks (account 711) from the incomes related to costs of services in process (account 712) and whose economic content and ways of operation are presented in diagram below:



Summarizing the above, we note that the difference between the creditor and debtor turnover in account 711 "Changes in stocks" represents, at the end of each reporting period, increase or decrease of the total cost, including the price differences related to its production finished and stored, difference which is transferred to the income statement, but the influence it exerts will be annulled in time².

Although we speak of incomes, in fact the question is to determine the costs of production that serve to assess the stocks obtained from own production and that generate revenue when sold.

The calculation of production costs is an attribute of management accounting and, in a general way³, is presented according to the schema shown in Figure 35.

Ch. Horngren, S. Datar și G. Foster (2006)⁴, as it results from the practice of SMEs in our country, following a study on the Australian companies in different

²<http://www.scribd.com/doc/40081387/tea-Veniturilor-Si-Cheltuielilor-Din-Activitatea-de-are-2>, accessed sept. 2010

³ C. Iacob, I. Ionescu, D. Goagăra, *Contabilitate de gestiune conformă cu practica internațională*, Craiova, Editura Universitaria, 2007, p. 43.

industry (food, textile, steel, chemicals, petroleum, printing and publishing, furniture and accessories, machinery and computers, electronics), note that the way to determine the production costs varies considerably from one sphere of activity to another.

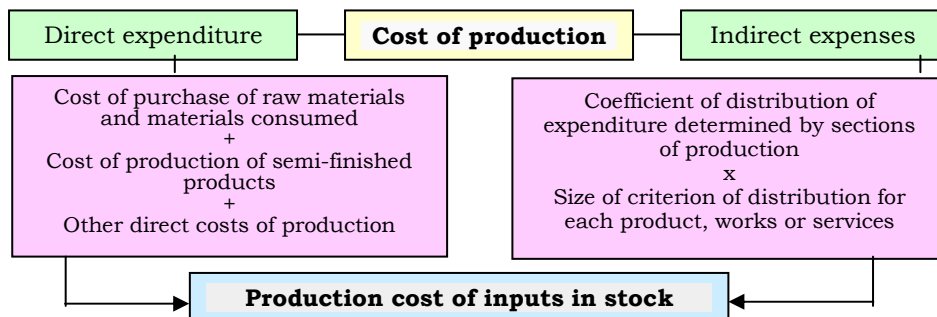


Figure 1. *Formation of the production cost*

In the context set, it is very difficult to bring to attention a calculation effective under the pretext of its validity for all types of activities. Yet we may state that, **at the level of principle, we can discuss the means to separate costs related to the finished production from those related to the production in progress, a particularly thorny issue encountered in practice and which, in most cases, determines the productive entities either to drop the actual determining of production costs or to make an improvised calculation.**

Given the above statement, using the accounting method on the example SC QQQ SRL (manufacturer of integrated circuits for electronic chips), we started from three working hypotheses⁵, namely:

- *Hypothesis 1*: there is no production in progress, neither in the beginning nor at the end of the period;
- *Hypothesis 2*: there is no production in progress in the beginning but it appears at the the end of the period,
- *Hypothesis 3*: running production both in the beginning and at the end of the period.

Hypothesis 1. In month N, within the production department 400 units of integrated circuits are manufactured and transferred to the products warehouse. For achieving this, there were recorded raw materials expenses worth 36,000 lei and 20,000 lei manufacturing costs, total 56,000 lei.

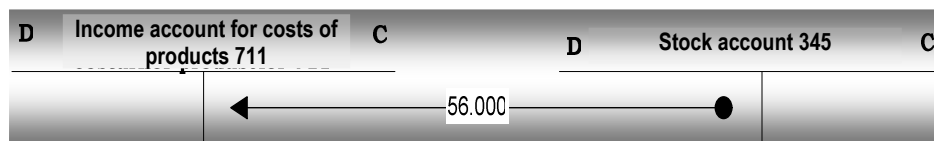
In this case, as the products are homogeneous and there is no production in

⁴ Ch. Horngren, S. Datar, G. Foster, *Contabilitatea costurilor, o abordare managerială*, Xith edition, Editura ARC, Chişinău, 2006, p. 643.

⁵ C. Iacob, I. Ionescu, D. Goagăra, *Contabilitate*, p. 72.

process, the unit production cost is 140 lei/pcs, of which 90 lei/pcs raw materials and 50 lei/pcs manufacturing costs.

Basically, this reasoning applies to all enterprises with homogeneous production and justifies the application of the method of simple division for the calculation of the unit cost and, in terms of accounting, the revenues related to the cost of production are recorded according to the scheme below:



Hypothesis 2. In month N +1, in the production department 400 integrated circuit units are manufactured but only 175 units are completed and transferred to the products storehouse, the remaining 225 are still in progress.

If raw materials expenditures are incorporated at the beginning of production process (and therefore they will raise the sum of 36,000 lei, too), the manufacturing costs being incurred evenly throughout the entire period of production operations, they justify the registration of their lower level than the previous month, respectively of 15,500 lei and, following the evaluation, it is estimated that the finishing stage of production in progress is of 60%.

For the calculation of the cost it is necessary firstly to determine the products in progress equivalent finished, in order to achieve the correct charging of expenses using the principle of lump assessment on each cost component, as seen in Table 40.

Explanations	Physical units	Physical units which will be charged	
		Raw materials	Production costs
Units went into production	400		
Units of finished products	175	175	175
Products in progress (60% finished)	225	225	135 (225x60%)
Total units for calculation	400	400	310

Table 1. *Calculation of equivalent units under the hypothesis 2*

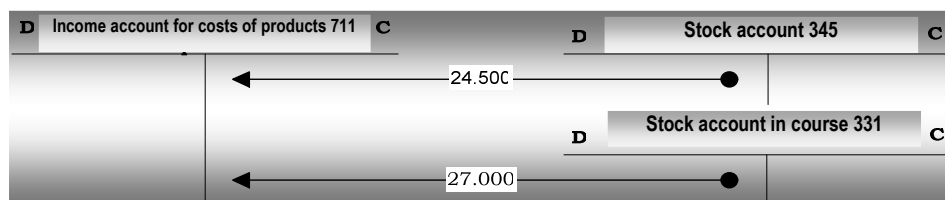
According to data from the table, the separation of costs between the finished production and the work in progress will be carried out according to equivalent units, with details that we will determine the two unit costs, one for raw materials and another one for manufacturing costs, as shown in Table 41.

Explanations	Total producti on cost	of which:	
		Raw materials	Production costs
Expenses recorded	51500	36000	15500
Units to which the costs are allocated		400	310
Cost per equivalent unit		90	50
Cost for finished units	24500	(175 x 90) + (175 x 50)	
Current production cost	27000	225 x 90	135 x 50
Total cost	51500		

Table 2. Separation between the finite production and production in progress under the hypothesis 2

The use of the lump assessment on each component of costs of production in progress presents the advantage of avoiding errors in decisions, especially those related to pricing policy.

In terms of accounting, the incomes related to the production in progress are recorded according to the schema below:



If the size of the indirect costs of production would be reported to the 400 units launched into production, without taking into account their degree of finish, the unit cost would have reduced from 140 lei to 128.75 and the error is obvious.

Hypothesis 3. In month N+2, there are in stock a number of 225 integrated circuits units in progress with a completion rate of 60%, and a number of 275 integrated circuits are launched in production.

We grant that we get 400 units of finished products and 100 units remain in progress, with a grade of 50% completion, at the end of the month. In terms of expenses, we have in view the following information: the value of production in progress at the beginning of the period of 27 000 lei, raw materials consumed during the month of 22,000 lei and 19,800 lei indirect production costs, total 68,800 lei.

Given the existence of the two types of production in progress, at the beginning and at the end of the period, in order to separate the costs between the two elements it is necessary to resort to methods of stock assessment, as shown in IAS 2, respectively the average weighted cost (AWC) method, the FIFO method and the standard cost method, methods used in theory and practice exclusively for stocks assessment, other than of

finished products, much less for the production in progress.

AWC method. The average weighted cost method can be used to calculate the cost of equivalent units during the exercise, having in view both the production in progress at the beginning and the end of the period, and of the finished products to be sold and delivered for valorization.

The AWC is obtained by dividing the total production costs by the total number of equivalent units which cross the production process over a reporting period. Therefore, what is important to establish aims at determining the equivalent amount of products, and which, according to data from hypothesis 3, is as follows (Table 42):

Explanations	Physical units	Physical units which will be charged	
		Raw materials	Production costs
Production in progress at the beginning of the period	225		
Units went into production	275		
Total products in manufacturing	500		
Units of finished products	400	400	400
Products in progress (50% finished)	100	100	50 (100x50%)
Total units for calculation	500	500	450

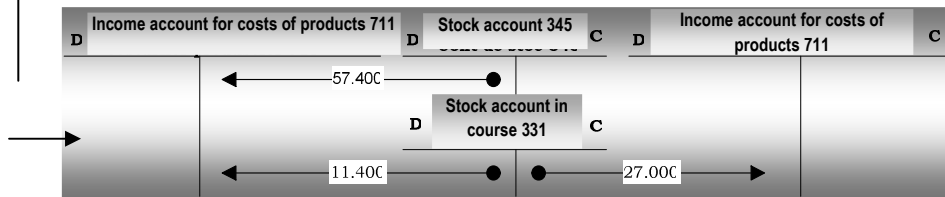
Table 3. *Calculation of equivalent units for separation of costs according to hypothesis 3, by AWC method*

The calculation of equivalent units by AWC method is based on the total equivalent units to which the technological operations shall be carried out until the end of the reporting period, regardless of the fact that they originate from the previous period or from the current period.

The major problem that arises is to consider all costs involved in carrying out the production and according to which the separation on stages of production progress is done and the unit cost can be determined, as seen in Table 43, which leads to reflection in accounting according to the attached scheme.

Explanations	Total production cost	of which:	
		Raw materials	Production costs
Production in progress at the beginning of the period	27000	20250	6750
Expenses for the period	41800	22000	19800
Total expenses incurred		42250	26550
Units to which the costs are allocated		500	450
Cost of one equivalent unit		84,5	59
Total cost of production, of which	68800		
- for finished products	57400	(400x84.5) + (400x59)	
- for the production in progress at the end of period	11400	8450	2950
		(100 x 84.5)	(50 x 59)
Total cost of production	68800		

Table 4. Calculation of average weighted cost



FIFO method. Unlike the AWC method, the FIFO method is characterized by the fact that it makes a distinction between the products which are in progress at the beginning of the period and the products launched in manufacturing during the period. The expenditure incurred during the current period and the units produced during the same period are used to calculate the unit cost by validating the units on which technology operations were executed during the current period.

In the context set, the FIFO method involves the following calculations:

- The cost of production in progress at the beginning of the period is charged to articles finished and transferred outside the department;
- The cost of equivalent units executed during the period alleges as follows: first to the finished products obtained from the initial production in progress, then to the new items went into production and, finally, to the units under execution at end of the period.

The FIFO method assumes that the older product units finish first.

Continuing the previous example, the calculation of the equivalent units, according to specifications, is presented in Table 44, in which the following can be noted:

- first units of products considered to be finished during the period are the 225 physical units existing at the beginning of the exercise in progress;
- according to Hypothesis 3 stated above, we admitted that 400 product units were finished during month N+2. If 225 were finished from the original production in progress, it results that from the production of 275 units launched in manufacturing in month N+2, 175 product units were finished,
- at the end of the month it remains a production in progress of 100 units and that represents the difference between the production launched in manufacturing (275) and finite production of 175 units manufactured obtained during the period.

Explanations	Physical units	Physical units which will be charged	
		Raw materials	Production costs
Products in progress at the beginning of the period (60% finished)	225		
Units went into production	275		
Total products in manufacturing	500		
Units of finished products in initial stock	225	0	90 (225 x 40%)
Started and finished products	175	175	175
Products in progress at the end of the period (50% finished)	100	100	50 (100x50%)
Total units for calculation	500	275	315

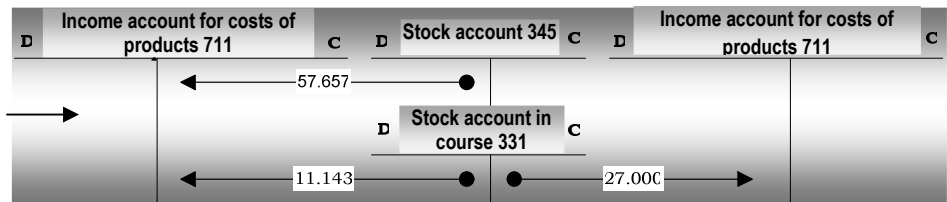
Table 5. *Calculation of equivalent units for separation of costs by FIFO method, according to Hypothesis 3*

Equivalence of units produced has in view the degree of their finish in the following sense: the 225 units in progress at the beginning of the period still need 40% to be completed, and those at the end of the period show a degree of finish of 50%. Therefore the 225 product units will not receive raw materials costs but only manufacturing costs.

In the context set, the calculation of costs is presented in Table 45, and in terms of financial accounting, the cost of the obtained production reflects according to the attached scheme:

Explanations	Total production cost	of which:	
		Raw materials	Production costs
Production in progress at the beginning of the period	27000		
Expenses for the period	41800	22000	19800
Units to which the costs are allocated		275	315
Cost of one equivalent unit		80	62.857
Total cost of production, of which	68800		
- for finished goods manufactured from the initial stock	5657 + 27000	0	5657 (90 x 62.857)
- for finished production in the current month	25000	(175 x 80) + (175 x 62.857)	
Cost for finished products	57657		
- for the production in progress at the end of period	11143	8000 (100 x 80)	3143 (50 x 62.857)
Total cost of production	68800		

Table 6. Calculation of cost by FIFO method



The FIFO method in its pure form is very rarely applied. The method practiced in reality is a modified method called the method "by workshop/department"⁶ because it is used to calculate the cost of products manufactured in a production department and transferred to other departments.

For convenience, in terms of practical aspects, the products went to the next department (when we have a chain of operations) or handed over to the products warehouse, are valued at average unit cost, which makes the application of IAS 2 on using the FIFO method to unnecessarily complicate the accounting, given that the principle of continuity of methods is not respected.

Making a comparison between the way of establishing the costs of the two stages of the production by FIFO method and by AWC method, the following result is reached (Table 46):

⁶ G Langlois, *Comptabilité de gestion*, Paris, Ed. Pearson Education, 2006, p. 106.

	AWC (Table 43)	FIFO (Table 45)	Differences
Cost of finished units	57400	57657	+257
Cost of production in progress	11400	11143	-257
Total cost of production	68800	68800	

Table 7. Comparison of costs by methods AWC and FIFO

As observed, the cost of production in progress by the AWC method is 257 lei higher than that determined by the FIFO method. This difference is significant if the differences are aggregated with differences of other products manufactured by the company. The AWC method has the effect of increasing the value of production in progress recorded in the balance sheet, and so an increase in the result of the operation and income tax.

The differences in costs between the two methods are a consequence of the manner of establishing the equivalent units used in the evaluation of production.

The FIFO method has the advantage that, on the one hand, it provides information on the evolution of unit costs from one period to another and thus the performance of the current period can be compared with the performance of the previous period, and that, on the other hand, provides useful information for forecast and control.

The AWC method produces a mixture of costs of successive periods, reason why it hampers the comparability of data. However, the AWC method has the advantage of simplicity of calculations and of obtaining an average unit cost which is very significant when prices of raw materials show significant fluctuations from month to month.

Standard cost method. The AWC and FIFO methods become very complicated at the level of companies which manufacture a wide range of products. The standard cost method has the advantage of outlining the quantities needed to manufacture a product and, therefore, the standard unit costs may be affected to these standard amounts of resources to determine the standard cost per unit of product. The identification of the standard cost per each product avoids the inconvenience to determine the actual cost of all products or the calculation of an average cost.

For illustration, we will resume the data used in the presentation of the FIFO method and we will assume that the size of standard costs is:

- Raw materials 74 lei/unit
- Production costs 54 lei/unit
- Standard production unit cost 128 lei/unit

To be more explicit, we recall the situation of production during the month, namely:

□ Production in progress at the beginning, 60% degree of finish, for which it is consumed: - direct materials 100% - production costs 60%	225 units
□ Products started to be processed during the month	275 units
□ Finished products at the end of the month	400 units
□ Products in progress at the end of the month, finishing 50%, for which it is consumed: - direct materials 100% - production costs 50%	100 units

Based on the above data, the standard cost of unfinished production existing at the beginning of the period will be of:

• Raw materials (225 units x 74 lei)	16650 lei
• Processing costs (225 units x 60% x 54 lei)	7290 lei
• Total standard cost of unfinished production at the beginning of the period	23940 lei

We remind that the amount of the actual expenses during the month was of 22,000 lei raw materials costs and 19,800 production costs, total expenses 41,800 lei.

As in the previous example, the calculation of the equivalent units, according to specifications, is presented in Table 47.

Explanations	Physical units	Physical units which will be charged	
		Raw materials	Production costs
Products in progress at the beginning of the period (60% finished)	225		
Units went into production	275		
Total products in manufacturing	500		
Units of finished products in initial stock	225	0	90 (225 x 40%)
Started and finished products	175	175	175
Products in progress at the end of the period (50% finished)	100	100	50 (100x50%)
Total units for calculation	500	275	315

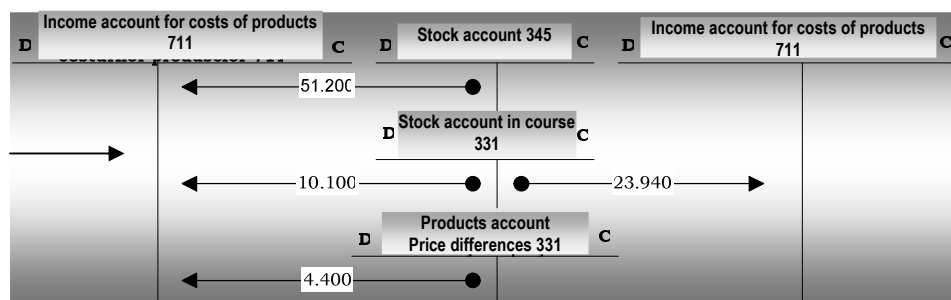
Table 8. Calculation of equivalent units for separation of costs by the standard method, hypothesis 3

As it can be seen, as in the case of the FIFO method, the 225 units in progress at the beginning of the period still need 40% to be completed, and those at the end of the period show a degree of completion of 50%. Therefore the 225 product units will not receive raw materials costs but only manufacturing costs.

In the context set, the calculation of the standard costs and of the cost differences is presented according to the data in Table 48.

Explanations	Total producti on cost	of which:	
		Raw materials	Production costs
Standard unit cost	128	74	54
Production in progress at the beginning of the period at standard cost according to calculation made	23940		
Standard costs for the current period (275 x 74) + (315 x 54)	37360	20350	17010
Total standard cost (debit account 921, analytical cost of production), of which:	61300		
- for finished goods manufactured from the initial stock	4860 + 23940	0	4860 (90 x 54)
- for finished production in the current month	22400	(175 x 74) + (175 x 54)	
Cost for finished products	51200		
- for the production in progress at the end of period	10100	7400 (100 x 74)	2700 (50 x 54)
Total cost of production (credit account 921, analytical cost of production)	61300		
Determination of differences			
standard costs	37360	20350	17010
actual expenditure	41800	22000	19800
unfavorable differences	+ 4440	+ 1650	+ 2790

Table 9. Cost calculation according to standard method



Although the standard cost method is much simpler to apply, as it can be seen, all price differences pass onto the finished products.

Thus, **in our opinion, the problem is not the method of accounting the incomes associated with the cost of production in progress, but the way of evaluating the production obtained and stored, especially when both finished goods and goods in process are obtained.** The same problem is found also in the case of services, when there are both performed services (completed) and running services (particularly appropriate in case of service activity).