The impact of the assessment methods of the stock exits on an entity's performance

Adrian TRIFAN[1]

Abstract: *The choice of the assessment method of the stock exits affects both the value of the final stock and the trading margins. An unjustified choice results in manipulating the information about the stock value in the balance sheet as well as the one about the effect on the performance (the overvaluation or undervaluation of the result). The Romanian accounting referential clearly establishes the agreed methods. The use of one or the other is left to the management and it is influenced by the specific activity. In addition, the chosen method should be applied consistently for similar elements such as fungible assets and stocks from one year to another. Changing the method is permitted only if it is justified.*

Key-words: *stocks, weighted average cost, first in – first out, last in – first out.*

1. Overview

Stocks are current assets held for sale in the ordinary course of business, under production or held as raw materials and other supplies to be used during the production process or the provision of services.

As a rule, the entries of goods (stocks) are unproblematic in terms of evaluation, as all the information on quantities and their prices are taken from the source documents. Thus, at the entrance in the entity, the stocks and production in progress are measured and recorded in the accounts as follows:

- raw materials, consumables, materials as inventory objects, merchandise and other goods purchased against payment at cost;
- production in progress, semi-finished products, finished products and other goods produced by the entity, at the cost of production;
- goods obtained free of charge at fair value;
- goods representing the company's capital, at the input value.

In practical terms, the assessment of the stock exits causes difficulties. The assessment of the stock exists (through use or sale) is performed according to the nature of the considered element (identifiable stocks and fungible stocks).

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[1] Transilvania University of Braşov, Faculty of Economic Sciences and Business Administration, adrian.trifan@unitbv.ro

Identifiable stocks are material goods individualized for each item, both when entering the entity and when exiting the accounts.

However, for the fungible stocks (goods that cannot be uniformly identifiable within a category) the assessment and the registration in the accounts are done by one of the following methods:

1. WAC (weighted average cost);
2. FIFO (first in – first out);
3. LIFO (last in – first out).

1.1. The weighted average cost method

This determines the cost of each item, depending on the weighted average cost of the similar items on stock at the beginning of the period and the items purchased or produced during the period. The final stock is assigned the calculated weighted average cost.

The weighted average cost can be determined periodically or on the acceptance of each new delivery to the warehouse, according to the following equation:

$$WAC = \frac{S_{iv} + I_v}{S_{ic} + I_c}$$

where:

S_{iv} – the stock at the beginning of the period expressing values;
I_v – entries during the period in terms of value;
Sic – the stock at the beginning of the period expressing quantities;
I_v – entries during the period expressed quantitatively.

Depending on the weighted average cost, the value of the exits is determined either periodically (end of month) or after the receipt of each lot, according to the following equation:

$$V_e = Q_e \times WAC$$

where:

V_e – the value of the exits;
Q_e – the exited quantity.

1.2. The first in – first out method

According to this method, the goods that exited the inventory accounts are assessed at the purchasing (or production) cost of the first entry (lot). As the lot is exhausted, the goods that exited the inventory accounts are valued at the cost of acquisition or production of the next lot, in chronological order.

1.3. The last in – first out method

According to this method, the goods that exited the inventory accounts are assessed at the purchasing (or production) cost of the last entry (lot). As the lot is exhausted, the goods that exited the inventory accounts are valued at the cost of acquisition (or production) of the previous lot, in chronological order.

We present below, based on a hypothetical example, the impact of the assessment method on the stock exits both on the costs of the inventory period and on the final stock value, as well as on the impact on the entity's performance.

2. Example

The situation of the stocks in March is as follows:

1st March – initial stock 20 pieces x 10,000 lei/piece;
10th March – entries 40 pieces x 4,000 lei/ piece;
18th March – entries 60 pieces x 6,000 lei/ piece;
21st March – entries 160 pieces x 9,600 lei/ piece;
30th March – entries 30 pieces x 4,000 lei/ piece;
19th March – exits 80 pieces;
23rd March – exits 140 pieces.

We will calculate the influence of the different assessment methods at the exit on the final stock value.

2.1. The weighted average cost method

As mentioned above the average can be calculated periodically or after each reception. The calculation period must not exceed the average duration of storage.

Thus:

a. WAC calculated periodically (monthly):

[(20 pieces x 10,000 lei/piece) + (40 pieces x 4,000 lei/piece) + (60 pieces x 6,000 lei/piece) + (160 pieces x 9,600 lei/piece + (30 pieces x 4,000 lei/piece)] : (20 pieces + 40 pieces + 60 pieces + 160 pieces + 30 pieces) = 2,376,000 lei : 310 pieces = 7,664.5161 lei/ piece

The value of the exits on the 19th March = 80 pieces x 7,664.5161 lei/piece = 613,161.29 lei

The value of the exits on the 23rd March = 140 pieces x 7,664.5161 lei/piece = 1,073,032.30 lei

The value of final stock = (310 pieces – 80 pieces – 140 pieces) x 7,664.5161 lei/piece = 689,806.45 lei

b. WAC calculated after each and every reception:

The value of the exits on the 19th March:
1st March Initial Stock   20 pieces x 10,000 lei/piece
10th March Entries   40 pieces x 4,000 lei/piece

WAC_1 = (20 pieces x 10,000 lei/piece + 40 pieces x 4,000 lei/pieces) : (20 pieces + 40 pieces) = 6,000 lei/piece

10th March Initial Stock   60 pieces x 6,000 lei/piece
18th March Entries   60 pieces x 6,000 lei/piece

WAC_2 = (60 pieces x 6,000 lei/piece + 60 pieces x 6,000 lei/piece : (60 pieces + 60 pieces) = 6,000 lei/piece

18th March Available Stock   120 pieces x 6,000 lei/piece
19th March Exits   80 pieces x ?

The 80 pieces exist at a weighted average cost equal with 6,000 lei/piece.
The value of the exits on the 19th March:
    80 pieces x 6,000 lei/piece = 480,000 lei

In the stock there will be:
    120 pieces – 80 pieces = 40 pieces, evaluated at WAC_2 = 6,000 lei/piece.

The value of the exits on the 23rd March:
18th March   Remaining Stock   40 pieces x 6,000 lei/piece
21st March   Entries   160 pieces x 9,600 lei/piece

WAC_3 = (40 pieces x 6.000 lei/piece + 160 pieces x 9,600 lei/ piece) : (40 pieces + 160 piece) = 8,880 lei/piece.
  21st March Available Stock   200 pieces x 8,880 lei/piece
  23rd March Exits   140 pieces ?

The 140 pieces exist at a weighted average cost equal with 8,880 lei/piece.
The value of the exits on the 23rd March = 140 pieces x 8,880 lei/piece = 1,243,200 lei
In the stock there will be 200 pieces – 140 pieces = 60 pieces, evaluated at WAC = 8,880 lei/piece.

The value of the final stock:
30.03   Entries   30 pieces x 4,000 lei/piece

WAC_4 = (60 pieces x 8,880 lei/piece + 30 pieces x 4,000 lei/ pieces) : (60 pieces + 30 pieces) = 7,253.3333 lei/ piece.

For the calculation of the costs with the weighted average cost method it is recommended to use a bigger number of decimals.

30th March   Available Stock   90 pieces × 7,253.3333 lei/piece

The value of the final stock = 90 pieces x 7,253.3333 lei/piece = 652,800 lei

2.2. The first in – first out method
Thus:
The value of the exits on the 19th March:

1st March	Initial Stock	20 pieces x 10,000 lei/piece
10th March	Entries	40 pieces x 4,000 lei/piece
18th March	Entries	60 pieces x 6,000 lei/piece
19th March	Exits	80 pieces? There still are 40 pieces x 6,000 lei/piece.

The value of the exits on the 19th March:
(20 pieces x 10,000 lei/ piece) + (40 pieces x 4,000 lei/ piece) + (20 pieces x 6,000 lei/ piece) = 480,000 lei

The value of the exits on the 23rd March:

19th March Remaining	Stock	40 pieces x 6,000 lei/piece
21st March	Entries	160 pieces x 9,600 lei/piece
23rd March Exits	140 pieces?	There still are 60 pieces x 9,600 lei/ piece.

The value of the exits on the 23rd March = (40 pieces x 6,000 lei/piece) + (100 pieces x 9,600 lei/piece) = 1,200,000 lei

The value of the final stock:

23rd March	Remaining Stock	60 pieces x 9,600 lei/piece	576,000 lei
30th March	Entries	30 pieces x 4.000 lei/piece	120,000 lei
	Final Stock		696,000 lei

2.3. The last in – first out method

Thus:

The value of the exits on the 19th March:

1st March	Initial Stock	20 pieces x 10,000 lei/piece
10th March	Entries	40 pieces x 4,000 lei/piece
18th March	Entries	60 pieces x 6,000 lei/piece
19th March	Exits	80 pieces? There still are 20 pieces x 10,000 lei/piece and 20 pieces x 4,000 lei/piece.

The value of the exits on the 19th March:

(60 pieces x 6,000 lei/piece) + (20 pieces x 4,000 lei/piece) = 440,000 lei

The value of the exits on the 23rd March:

19th March	Remaining Stock	20 pieces x 10,000 lei/piece
		20 pieces x 4,000 lei/piece
21st March	Entries	160 pieces x 9,600 lei/pieces
23rd March	Exits	140 pieces? There still are
		20 pieces x 10,000 lei/piece,
		20 pieces x 4,000 lei/piece
		and 20 pieces x 9,600 lei/piece

The value of the exits on the 23rd March:

(140 pieces x 9,600 lei/piece) = 1,344,000 lei

The value of the final stock:

23rd March	Remaining Stock	20 pieces x 10,000 lei/piece	200,000 lei
		20 pieces x 4,000 lei/ piece	80,000 lei
		20 pieces x 9,600 lei/ piece	192,000 lei
30th March	Entries	30 pieces x 4,000 lei/ piece	120,000 lei
	Final Stock		592,000 lei

3. Results and discussions

Depending on the purpose, management may choose any of the above assessment methods.

Reviewing the results, the situation is as in the following table where is included a comparative analysis of the stock assessment methods:

Assessment method	Costs related to exits (lei)	Quantity at the end of the period(piece)	The value of the final stock (lei)
WAC - calculated periodically - calculated after each reception	1,686,193.59 1,723,200.00	90 90	689,806.45 652,800.00
FIFO	1,680,000.00	90	696,000.00
LIFO	1,784,000.00	90	592,000.00

Table 1. *The comparative analysis of the stock assessment methods*

The higher value of the final stock is found at FIFO, which means that the final stocks are valued at the most recent values and are, therefore, closer to the economic reality. The method is simple and easy to apply.

Disadvantages of the FIFO method:

● stock exits are undervalued during inflation, which leads to a minimization of costs and an overvaluation of the financial statement result;

● conversely, the exits from the stock are overvalued during a period of falling prices, so the costs correlate with delay with the price variations.

In terms of applying the LIFO method, the exits from the stock are valued at the latest costs. In times of inflation, consumption is overvalued compared with FIFO, which leads to an increase in costs and a decrease in the financial result, so a reduction of the income tax. The reverse phenomenon occurs in a period of falling prices.

The disadvantage of the LIFO method is that although costs are correlated with the price variations, the stock is undervalued in case of currency depreciation.

Instead, the weighted average cost method that is mostly used in Romania is a compromise between FIFO and LIFO.

The WAC version periodically calculated has the advantage of levelling the variations of cost (price) in the case of fluctuations in currency and simplifying the stock assessment calculations.

The disadvantages of this version are:

● it does not allow the assessment of each exit from the stock, only their overall evaluation at the end of the reporting period, which is contrary to the basic principle of perpetual inventory: the ability to determine at any time the value of the final stock;

● means of smoothing the assessments: the value of the final stocks will be minimized during the periods of rising prices and overstated during the periods of falling prices.

Finally, the WAC version calculated after each reception has as main advantages the following:

● the value of the stock and of the stock exits are known at all times;

● the value of the exits thus calculated are closer to the economic reality at that time.

Due to its complexity, the use of this alternative calculation is difficult, especially for the operating cycles where stock movements are very numerous. It can, however, be easily adapted in case of automated management.

Our country's laws allow the assessment of the stocks from purchases and / or from own production at standard costs, established on the normal levels of materials and supplies, labour, efficiency and production capacity. These normed levels should be periodically reviewed and adjusted if necessary, depending on the conditions existing at a certain time.

The differences in price over the cost of acquisition or production should be highlighted separately in the accounts, being recognized in the cost of the asset.

The distribution of the differences in price on the existed goods and the stocks is carried out using a coefficient that is calculated as follows:

$$\text{Distribution coefficient} = \frac{\text{Initial balance of price differences} + \text{Price differences of entries during the period, cumulative from the beginning of financial year to the end of the period}}{\text{Initial balance of stocks at registration price} + \text{Value available until the end of the re-entry period, at the registration cost, cumulative from the beginning of financial year}}$$

This distribution coefficient is multiplied with the value of the goods exited from the accounts at the registration price and the resulted amount is recorded in the proper accounts where the exited goods were recorded.

At the end of the period, the balances of the differences accounts cumulate with the balances of the stocks accounts, at the registration price, so that these accounts reflect the amount of the stocks at the acquisition cost, respectively the production one, as appropriate.

The purpose of this method is, therefore, to quickly and easily get a real-time assessment of the stock exits from the accounts.

Using the data from the above given hypothetical example and considering that the periodically calculated WAC of 7,664.5161 is the standard cost, results the following assessment of the exits and the final stocks:

  ● Value of exits = 220 pieces x 7,664.5161 lei/piece = 1,686,193.50 lei

  ● Value of final stock = (20 pieces in initial stock + 290 entered pieces – 220 exited pieces) x 7,664.5161 lei/piece = 689,806.45 lei

  Moreover, in the retail sale the retail price method can be used to determine the cost of the numerous and fast moving inventories that have similar margins and for which it is impractical to use another method.

5. Conclusions and recommendations

All methods of assessment of stocks elements listed above have the same objective: to assess the exits from the stocks. None of these is 'perfect', the value of the final stock changing each time, as we have seen from their comparative analysis. In addition, changing the value of the final stock determines a variation of the outcome. However, the result does not depend only on the entity's performance, but on its methodological options of the assessment of the stock exits, namely:

  ● the versions of the successive stock exits method (FIFO and LIFO) are complex and involve the need to know permanently the structure of the stock;

  ● the above presented methods are excellent in terms of a principle, but it is very important to know to what extent they can present accurate data;

  ● the FIFO and LIFO methods give extreme results, the former reaching the final stock at the highest value, and the latter at the lowest value;

  ● for the WAC method, the assessments range between the values obtained by the FIFO and LIFO methods;

  ● the LIFO method is not the most appropriate method for determining the current value of the stocks listed on the balance sheet on long-term, in particular, when an increase or decrease in price can exist;

  ● the FIFO method is the most appropriate method of assessment of the stocks listed in the balance, because the value of the final stock determined with this method is the nearest to the current value, thereby providing a more real image of the stocks.

  If, in contrast, the costs are decreasing by applying the FIFO method, the exits are assessed at the highest costs, the final stocks at the lowest cost and the profit is minimal. The minimisation of the profit is given by the lowest margin (due to highest cost of the exits) and the potential profit (minimum) resulted from the final balance.

If the LIFO method is applied, the effects are reversed, that is the exits are assessed at the lowest costs, the final stocks at the highest costs, and the profit is increased.

In conclusion, when choosing the assessment method of the stock exits one should take into account its effects on the annual financial statements, the income tax, and the management's decisions.

6. References

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