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## The Impact of Inventory Costing Methods on **Financial Ratios: A Comparative Case Study of FIFO and Weighted Average Methods**

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#### Abstract

In this study, it is aimed to analyse the effect of inventory cost valuation methods on financial statements. Within the scope of the study, two different scenarios were created according to two situations in which prices increase or decrease in intra-period trade goods purchases. In this context, FIFO and Weighted Average Cost methods were selected from inventory cost valuation methods. In order to analyse the effects of these two different methods on the financial statements, Current Ratio, Inventory Turnover Ratio and Days Inventory Outstanding, Gross Profit Margin and Debt Ratio were selected, and analyses were carried out. As a result of the study, it has been determined that the choice of inventory cost valuation method has the potential to have a high impact on the financial performance indicators of an enterprise at a level that will affect the credibility of the enterprise, therefore, enterprises should choose an inventory cost valuation method by considering their performance and budget targets

Keywords: FIFO, Weighted average inventory, Financial ratios

#### 1. INTRODUCTION

Analysing the financial performance of an enterprise in terms of evaluating its overall performance and financial ratios are of great importance in terms of analysing its financial performance.

In the process of analysing financial statements, financial reports prepared by companies are used together with other information to evaluate the past, current and potential performance and financial position of a company in order to make investment, credit and other economic decisions, and financial analysis is performed to make decisions about the management of the company [1].

In this context, the choice of methods to be applied in the accounting processes of the enterprise is of great importance due to its impact on the financial statements. The choice of the method to be used in determining the cost of inventories is of high importance in terms of determining the value of the inventories account group in the balance sheet on the one hand and affecting the profitability of the enterprise on the other hand. The inventory cost valuation method applied will affect the financial statements and therefore the financial ratios and the creditworthiness of the enterprise.

Cost can be defined as the financial sacrifice made by a company to purchase or produce anything, and the business accepts the costs incurred in the expectation of generating sales revenue and profit as a result of incurring costs. [2].

In order to calculate the value of inventories, it is necessary to know the costs of the products being



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produced. In commercial organisations, inventory values are the prices of the purchased goods in the invoice subject to the commercial transaction, and the costs incurred to bring the goods to their current state and position are also included in the calculation when calculating the cost. In manufacturing enterprises, labour inputs and other manufacturing costs are added to the price of the purchased material, and in accordance with the principle of valuing assets at cost in accounting, inventories are valued at production costs and included in the balance sheet [3]. In this context, cost accounting is the process of identifying all costs related to the activity process, whether a business produces products, provides services or conducts its activities by buying and selling, and is used for all types of businesses [4]. The cost accounting system provides information about how decisions affect costs and revenues [5].

#### 2. Conceptual Framework

In this section, explanations about the inventory cost valuation methods used within the scope of the application and the financial ratios that will be taken into consideration within the scope of the effect of inventory cost method preferences on financial performance are given.

#### Inventory Cost Valuation Methods Used in the Scope of Application

Inventories are defined in the International Accounting Standards as assets held for sale in the ordinary course of business, assets in the business that are being produced for sale or assets in the form of raw materials and supplies to be used in the production process or in the provision of services [6]. Inventory cost calculation methods are also defined in the relevant accounting standard referred to above and in this context, FIFO and weighted average methods are explained as follows [6]:

- According to the FIFO method, it is assumed that the first purchased or produced inventory items are sold first and consequently, as a result of this assumption, the last purchased or produced items constitute the end-of-period inventories.
- According to the weighted average cost calculation, the cost of each item is determined by calculating the weighted average of the cost of similar items at the beginning of the period and the cost of similar items purchased or produced during the period, and this average value is recalculated after each additional purchase.

The valuation problem arises due to the fact that inventories are purchased and supplied on different dates and at different prices. The main part of the problem is which price should be taken as the basis for valuation [7].

In this context, explanations regarding the weighted average cost and FIFO methods used for valuation are given below:

Firstly, it is important to note that:

Whether a firm uses the FIFO or average costing, the total units transferred to the next department come from the following two sources [8]:

- 1. Beginning Inventory
- 2. Current production, also referred to as units started and finished during the period. It should be noted that units started and finished are not the same as units started or transferred in the process. Units started in process only indicate that units have entered the production process; they may not be finished at the end of the period. Transferred units come from both the current production of units started and completed and from the starting stock.

The FIFO method (First in First Out method) assumes that the oldest products are sold first, according to the time of entry into stock [4]. The FIFO method allows you to see the effect of selling cheaper or more



expensive goods first, and this effect is the effect on profit [4]. The FIFO method assumes that the oldest items are consumed first and therefore the ending inventory always contains the newest items [9].

With the FIFO Method, ending inventory will be valued at the latest purchase prices [10].

Explanations about the average cost method are given below [7]:

In this method, the material is derecognised at the average cost price regardless of the purchase date and price. The average cost method is of two types:

a) Simple Average Method: In this method, the average price is calculated by adding the prices at which the materials were purchased on different dates during the period and then dividing the sum of these prices by the number of prices taken into account for the calculation of the average price. In other words, the simple average price is calculated by dividing the total prices of the materials in the stock from which the material is extracted by the number of prices included in the calculation.

b) Weighted Average Method: Since the normal average method is based on the material purchase rate, the weighted average method is used to eliminate this defect. In this method, the calculation is performed by taking into account both the price and quantity of the material.

# Financial Ratios Used as a Basis for Measuring Financial Performance within the Scope of Application

In the methodology section, changes in the structure of the financial statements as a result of the use of different inventory cost valuation methods within the scope of the increase and decrease of costs during the period are discussed and current ratio, inventory turnover ratio, days inventory outstanding, gross profit margin and debt ratio are used to measure the changes in financial performance resulting from the changes in financial statements.

#### **Current Ratio**

The current ratio is calculated by the formula 'Current Assets / Current Liabilities' and measures a company's ability to pay its short-term liabilities [11]. Current ratio shows the efficiency of the company's operating cycle. Current assets are assets that can be converted into cash in the short term and the higher the current ratio, the more liquid the company is assumed to be [12].

#### **Inventory Turnover Ratio and Days Inventory Outstanding**

Inventory turnover is used to measure how much inventory is sold proportionally in a year and therefore shows the efficiency of the company's inventory management [12]. Inventory turnover ratio shows the number of times a company's inventories are sold and replaced during a period [11].

#### **Gross Profit Margin**

Gross profit margin is calculated as gross profit divided by net sales [12]. Gross margin is related to the relationship between sales and production or selling costs [13].

#### **Debt Ratio**

This ratio is used to measure the percentage of funds provided by creditors using assets and is calculated by the formula of "Debt Ratio= Total Debt / Total Assets" [14].

#### 3. Methods

This section analyses the formation of financial ratios as a result of the use of different inventory cost valuation methods according to two different scenarios in which the prices formed within the scope of in-period inventory mobility increase or decrease.

Within the scope of the study, FIFO and weighted average cost methods can be considered as independent variables within the scope of inventory cost valuation methods, and within the scope of



financial ratios, current ratio, inventory turnover ratio and days inventory outstanding, gross profit margin and debt ratio are considered as dependent variables.

#### Objective

The aim of the study is to determine the effect of different inventory cost valuation methods on financial performance within the scope of commercial goods purchases made by an enterprise during the financial period, according to a significant decrease-increase in purchase prices, within the scope of a sample application.

#### Assumptions

All other account groups and classes not affected by the inventory cost valuation method are held constant. According to the increase and decrease of costs during the period, two separate inventory movements have been created. In the first case, within the scope of intra-period purchases, inventory cost per unit increases by 10% based on the initial cost.

In the second case, within the scope of intra-period purchases, inventory cost per unit decreases by 10% based on the initial cost. In both scenarios, selling prices are determined by taking into account a 20% gross profit margin over the last purchase price.

Inventory at the beginning of the period, buying and selling quantities are the same in both cases. If there is a loss after sales, it is assumed that the loss is financed by short-term liabilities.

Inventory mobility within the scope of both case is given below:

First Case: In-Period Purchases and Sales with the Assumption of Increase in Cost Amounts Second Case: In-Period Purchases and Sales with the Assumption of Decreasing Cost Amounts

Date	Explanation	First Case		Second Case	
		Quantity	Cost Per Unit	Quantity	Cost Per Unit
Time-0	Inventory at the beginning of	40.000	1.000	40.000	1 000
	the period	40.000			1.000
Time-1	Purchase of commercial goods	10.000	1.100	10.000	900
Time-2	Purchase of commercial goods	10.000	1.200	10.000	800
Time-3	Purchase of commercial goods	10.000	1.300	10.000	700
Time-5	Purchase of commercial goods	10.000	1.400	10.000	600
Time-7	Purchase of commercial goods	10.000	1.500	10.000	500
Time-8	Purchase of commercial goods	10.000	1.600	10.000	400
Date	Explanation	Quantity	Selling Price	Quantity	Selling Price
			per Unit	Quantity	per Unit
Time-4	Sales	25.000	1.560	25.000	840
Time-6	Sales	25.000	1.680	25.000	720
Time-9	Sales	25.000	1.920	25.000	480

Calculations have been made for inventory cost valuations using the FIFO and weighted average cost methods according to both cases, and the results of the calculations, including the sections of the pro forma condensed balance sheet and income statement required for the calculation of the financial ratios considered within the scope of the application, are given in the next section.



#### 4. Results and Discussion

The status of the financial indicators taken as performance criteria according to both cases is given below:

	First Case		Second Case	
FINANCIAL INDICATOR	FIFO	WEIGHTED AVERAGE	FIFO	WEIGHTED AVERAGE
Current Ratio	2,25	2,12	0,84	0,91
Inventory Turnover Ratio	2,13	2,43	2,58	2,15
Days Inventory Outstanding	172	150	142	170
Gross Profit Margin	0,36	0,32	- 0,31	- 0,21
Debt Ratio	0,40	0,42	1,03	0,96

**Table 2. Financial Ratios According to Inventory Cost Valuation Methods** 

As can be seen, all financial indicators differ in both cases according to the selected inventory cost valuation method. According to the ratios coming from the sector average and to be considered as performance criteria, or according to the ratios determined by the company as criteria according to its performance targets, the company may remain below or above its performance targets according to the inventory cost valuation method it has chosen.

Price fluctuations during the period can significantly influence the current ratio. When the prices of trade goods increase, the current ratio tends to be higher under the FIFO method compared to the weighted average cost method. Conversely, in the case of declining prices, the current ratio is lower when FIFO is applied. In-period price changes have the potential to have a significant impact on the inventory turnover ratio and average days inventory on hand. In case of an increase in the prices of trade goods supplied during the period; if the FIFO method is preferred, the inventory turnover rate is lower, and the average number of days is higher compared to the weighted average cost method. In case of a decrease, the opposite is the case. In-period price changes have the potential to have a significant impact on profitability. In case of an increase in the prices of commercial goods supplied during the period, gross profit margin is higher than the weighted average method if the FIFO method is preferred. In case of a decrease, the gross profit margin decreases. This effect on gross profitability naturally has the potential to affect all ratios related to profitability. As a result of the increase or decrease in profitability, shareholders' equity is naturally affected and therefore, the ratios affected by the equity situation are also affected by the choice of inventory cost valuation method.

Intra-period price changes can significantly affect an entity's level of indebtedness and, consequently, its debt ratio.

According to the scenario created with the assumption of increasing costs during the period: When the FIFO method is applied, the balance sheet tends to expand, primarily due to an increase in shareholders' equity—driven by higher profitability—and elevated end-of-period inventory levels.

According to the scenario that assumes a decrease in costs during the period:

When the FIFO method is applied, the balance sheet tends to be smaller. This is primarily due to a reduction in shareholders' equity on the liabilities side—resulting from the loss—and lower end-of-period inventory levels on the assets side. In the sample application, shareholders' equity turned negative



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under the scenario based on the assumption of declining in-period costs. This outcome clearly highlights the potential impact of the selected inventory valuation method on the enterprise's financial statements. In our study, it is observed that the FIFO method significantly differentiates the current ratio compared to the weighted average method in both cases when prices decrease and increase. Considering that the book value of inventories in the balance sheet is much closer to the current value of inventories if the FIFO method is selected, it seems that it would be more appropriate to prefer the FIFO method in the calculation of the current ratio.

#### 5. Conclusion And Suggestions

The study analysed the effect of the inventory cost valuation method on financial ratios and found that the chosen method has the potential to have a significant impact on financial performance. Therefore, the change in financial ratios will closely affect the analysis of financial statements and the decisions to be made after the analysis. Therefore, it will be a correct working method to determine the budget targets related to the financial performance of the enterprise and to evaluate the inventory cost valuation methods within the scope of the plans and calculations made according to these targets, taking into account the effect of inventory cost valuation methods on financial ratios and to select and apply the inventory cost valuation method to be used within this scope. The decisions to be taken by the entity based on the current ratio, inventory cost valuation method chosen. As a result of these reasons, in order to fulfil financial management in a rational manner, it is necessary to make full and accurate future plans and calculations and to select the relevant inventory cost valuation method in line with these plans.

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