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INVENTORY COST FLOW ASSUMPTIONS AND LIMITATIONS OF LIFO: A CASE STUDY OF A MANUFACTURING FIRM IN ALBANI

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Abstract
Valuing the inventory at its cost has become a crucial need as a firm needs to know the cost it makes for the products made and sold and how the cost will have an impact on the firm's gross profit, tax to be paid, net income, and at the ending inventory during a specific accounting period. The two most known financial reporting standards, namely IFRS and U.S. GAAP, allow the use of an inventory cost flow assumption. This study mainly focuses on inventory cost flow assumptions. It is found, through the information collected, that the Albanian accounting system accepts Specific Identification (SI), First In, First Out (FIFO), and Weighted Average Cost (WAC) Flow Methods. At the same time, the most adopted inventory cost flow assumptions are the latter two, respectively. The second question emphasizes the reasons for the Last In, First Out (LIFO) cost flow assumption bans by IFRS and Albanian accounting standards. A case study of an actual manufacturing firm was used to conduct an empirical analysis and application of LIFO and WAC flow assumptions, resulting that the WAC flow assumption is more favorable to be used as it provides lower COGS, and a cost of the ending inventory, closer to the one with the current market prices.

Keywords: *Inventory Cost Flow Assumptions; FIFO; LIFO; WAC; Gross Profit.*

JEL Classification: *M40, M41*

I. INTRODUCTION

Despite the product it brings to the market, every type of firm has an inventory. The importance of an inventory is related to it being one of the most crucial current assets in a firm's balance sheet. Based on the definition of inventory, it represents the products that a firm owns and awaits to sell during an accounting period. As it is known, the reason for the existence of a business in the market is making the necessary costs to generate money. This is precisely the reason why the inventory is needed to include all the tangible products that a firm can sell.

To begin with, the type of firm considered in the research I have conducted is a manufacturing firm. In the first chapter of this article, I will provide information about the inventory subgroups, the need for having the inventory cost flow assumptions, and which ones of the latter are accepted and the most adopted under IFRS and the U.S. GAAP accounting standards as well as under the Albanian accounting system. Then, for each of these inventory cost flow assumptions, I will thoroughly analyze the order they follow, how a firm's gross profit, the tax amount, net income, and the cost of the ending inventory are affected by them during inflation and deflation, and each of the inventory cost flow assumptions' advantages and disadvantages. The literature review section will cover the limited information available, previous research, and how I am trying to impact the chosen research topic positively. Being the first to study the furniture-producing sector, I will be able to provide an empirical analysis of the inventory cost flow assumptions and their adoption in a manufacturing firm. An essential part of the empirical analysis is the transactions of 30 units as a concrete example of the cost flow. By the end, the quantitative data of a leading firm among the sofa manufacturing companies in the market based on the empirical analysis will show how valuable the theory is in understanding this article.

Moreover, there is a need to understand how the items leave the inventory and if any order is followed in this process. Even though this order might need to be accurately followed, an inventory cost flow assumption is made to decide how goods are removed from the inventory. More specifically, three inventory cost flow assumptions are used to determine the order of the leaving goods and value the inventory sold at its cost. These inventory cost flow assumptions are the aspects that I will concentrate on by studying them in more detail and thus emphasizing the prohibition of one of those, the LIFO cost flow assumption.

The purpose of this research is to be able to answer any questions related to the inventory cost flow assumptions. Those questions tend to determine the accepted and the most adopted inventory cost flow assumptions under the Albanian accounting system. Additionally, my goal is to have a better insight into why the LIFO cost flow assumption is prohibited from valuing a firm's inventory at its cost. Therefore, this will better show

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why the Albanian accounting system does not allow its adoption. Another essential aspect is understanding the preferable alternative in the inventory cost flow assumptions in the Albanian manufacturing sector.

II. THEORETICAL BACKGROUND

Definition of inventory and its importance

According to Gadge et al. (2013) *"inventories are assets which comprise goods purchased for consumption to manufacture finished goods (raw materials), any goods in the production process (work-in-progress), and finished goods ready for sale or goods purchased for resale in the normal course of business"*.

Jones and Smith (2007), claim that inventory is *"The aggregate of those items of tangible personal property which (1) are held for sale in the ordinary course of business, (2) are in the process of production for such sale, or (3) to be currently consumed in the production of goods or services to be available for sale"* (Carmichael et al., 2007:2).

Also, inventory is a nonfinancial asset that comprises most of the value of the total assets of a manufacturing or merchandise firm. It is classified as a current asset in a firm's balance sheet. Unlike some other assets, especially in a manufacturing firm, it is the most abundant but the least liquid. This means that it cannot be easily converted into cash or any other asset during a particular accounting period (Averkamp, 2020a; Bloomenthal,2020; Encyclopedia Britannica, 2006; Jones & Smith, 2007; Kieso et al., 2013; Needles & Powers, 2009; Rich et al., 2013; Tardi, 2020). Furthermore, the way how inventory converts to cash and thus generates revenues is only by selling the firm's products, the raw materials, or both of them, depending on the enterprise's choice (Chartered Financial Accountants (CFA) Institute, 2020; Williams et al., 2018). Another essential role of inventory is that based on its high value, by putting it as collateral, a manufacturing firm can take a loan for making further investments or as a way to pay the liabilities toward its creditors (Bragg, 2020; Carlson, 2019; Murray, 2019c).

Types of Inventories

In a manufacturing firm, there are seven subgroups of inventory in total, but four of them contribute to providing and offering a product to the customers:

1. Raw Materials
2. Work in Process
3. Finished Goods Inventory
4. Supplies (CFA Institute, 2020; Encyclopedia Britannica, 2006; Kenton, 2020b; Kieso et al., 2013; Needles & Powers, 2009; Tardi, 2020; Weygandt et al., 2013).

Since it is known that for producing a product, a manufacturing firm has to incur costs, three types of costs are associated with the three respective subgroups of inventory. Only when a product is sold are all these costs recognized and recorded as part of the Cost of the Goods Sold (COGS) Expense Account present on the firm's Income Statement. As a result, the cost of the product being sold will be debited to the COGS account and will be credited to the Finished Goods Inventory (Brewer et al., 2009; Encyclopedia Britannica, 2006; Tuovila, 2019).

Besides, the inventory values recorded on a firm's Balance Sheet are the costs of the respective ending inventory subgroups, which serve as inventory on hand and thus are necessary for the next accounting period (Bloomenthal, 2020; Bragg, 2019a, 2019d, 2019f, 2020; Hayes, 2020; Ross, 2019b; Tarver, 2018). Furthermore, the cost values given to each of the inventory types are determined through the Inventory Accounting (Kenton, 2020b; Tardi, 2020).

The firms may occasionally consider the Work in Process and Finished Goods Inventory as a group and not separately. The reason behind this choice is the reduction of manufacturing costs. Moreover, the manufacturing firms are advised to keep the In-Process costs as low as possible because it is hard, and it takes time to determine the amount of completion of an asset during this production phase (Bragg, 2019d, 2019f; Hayes, 2020; Ross, 2019b).

Raw Materials Inventory represents the cost of all the main components not used for further steps in producing the final product. Unlike the Raw Materials Inventory, Work in Process undergoes the production steps. Whereas the Finished Goods are the result of the production steps. Regarding Raw Materials Inventory, a manufacturing firm still owns this stock and includes it as an asset on its Statement of Financial Position during a specific accounting period (Bragg, 2019d; Jones & Smith, 2007; Kieso et al., 2013; Ross, 2019b; Weygandt et al., 2013). On the contrary, the term Cost of Raw Materials means that the costs of the basic materials used in the assembly process must be recognized and recorded by the firm to manufacture the product. Therefore, this is the difference between the Cost of the Raw Materials and the Cost of the Raw materials Ending Inventory, also known as the Raw Materials Inventory (Rich et al., 2013).

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More specifically, Direct and Indirect Materials are included in the group of Raw Materials, each one of them having a specific role in the manufacturing process (Bragg, 2019d; Ross, 2019b). Direct Materials, as implied by the name itself, are those materials that directly affect a manufacturing process by playing an integral role in obtaining the product since they can be directly traced into it (Jones & Smith, 2007; Ross, 2019b). The production process can only be developed with the presence of direct materials. The need to purchase arises when a firm faces the absence of essential materials. Additionally, in a manufacturing company's journal entries, the cost of the materials bought will be debited from the Raw Materials Inventory and credited to Cash or Accounts Payable, depending on the payment conditions set by the firm and the supplier. Whereas the cost of the direct materials used in the assembly process will be credited to the Raw Materials Inventory, and the exact cost will be debited to the Work in Process (WIP) Inventory (Bragg, 2019d).

Furthermore, the other Raw Materials' subsets, namely the Indirect Materials, are those components that affect the manufacturing process indirectly, as they do not have a fundamental role like the direct ones. The cost of the Indirect Materials used in the manufacturing process will be credited to the Raw Materials Inventory and will be debited to the Manufacturing Overhead expense account (Bragg, 2019d; Ross, 2019b).

The second type of Inventory is the *Work in Process Inventory*. This inventory's subgroup includes partly made products, since from the raw materials chosen for the process of production, there is also a direct labor force included and manufacturing overhead expenses incurred, which are recognized and recorded during the process (Bloomenthal, 2020; Kieso et al., 2013; Needles & Powers, 2009; Rich et al., 2013; Ross, 2019b; Weygandt et al., 2013). This step of production is also known as "The Conversion Stage" because it helps transform inputs into final products (CFA Institute, 2020; Investopedia, 2015; Tarver, 2018). It is important to emphasize that these inputs are part of the process of creating finished goods because once the process is finalized and a product is released, then the determination of the total cost for this production stage is credited to the WIP Inventory and debited to the Finished Goods Inventory (Bragg, 2019f; Hayes, 2020).

Another Inventory group is the *Finished Goods Inventory*. In this kind of inventory, we focus on the saleable finished goods finalized through the production process and now available to be sold to the customers (Bragg, 2019a; Hayes, 2020; Investopedia, 2015; Jones & Smith, 2007; Ross, 2019b; Weygandt et al., 2013). Once the products are sold, the cost of the overall manufacturing process, as well as other costs, are recognized, accumulated, recorded, and debited in the COGS expense account, and the exact cost will be credited to Finished Goods Inventory as well (Brewer et al., 2009; Hayes, 2020; Rich et al., 2013).

Supplies Inventory includes all the supplies contributing to producing a firm's final product. They do not have a fundamental role as the subgroup of Raw Materials does. However, they are considered additional items used for an effective and efficient production process (Jones & Smith, 2007; Kieso et al., 2013).

The Inventory Cost Flow Assumptions Accepted and Adopted Under IFRS and U.S. GAAP

The two accounting standards taken as a reference to study the inventory cost flow assumptions in detail are International Financial Accounting Standards (IFRS) and the U.S. Generally Accepted Accounting Principles (U.S. GAAP) (Bragg, 2019e). Both systems have in common the inventory cost flow methods such as First in, first out (FIFO), Weighted Average Cost (WAC), and in exceptional cases, The Specific Identification Method. The main difference among the accounting standards mentioned above is that in the IFRS, the LIFO cost flow assumption is prohibited, whereas, in the U.S. GAAP accounting system, it is allowed (Bragg, 2018a, 2018b, 2019c; CFA Institute, 2020; Kieso et al., 2013; Murray, 2019b; Ross, 2019a; Smith, 2019; Tardi, 2020; Tun, 2018; Weygandt et al., 2013). Moreover, the Albanian accounting system following IFRS is defined by the following methods as acceptable inventory cost flow methods:

· First in, first out (FIFO)
· Weighted Average Cost (WAC)
· Specific Identification Method (in particular cases)

The most commonly used inventory cost flow assumptions are first in, first out (FIFO) and weighted average cost (WAC) (Dhamo, 2015; Këshilli Kombëtar Kontabilitetit (KKK), 2016; Lati & Naço, 2009).

First in, first out Inventory Cost Flow Assumption (FIFO) is an inventory cost flow assumption that follows the idea that the first materials or merchandise bought by a manufacturing firm are the first items the firm uses in production or sells to the customer and following the same logic, the finished goods that are firstly available to them (Bragg, 2018a; Carlson, 2019; Encyclopedia Britannica, 2006; Smith,2019; Tun,2019). Likewise, the cost of goods sold reported on the business' income statement at the end of a specific accounting period is based on the cost of the previous items that first entered into the inventory. In this way, each closing inventory value on the firm's Statement of Financial Position reflects the cost of the most recent purchases and products produced, matching the currently available market prices (Averkamp, 2020c; Bragg, 2018b; Depersio ,2015; Gadge et al., 2013; IFT, Chartered Financial Accountants (CFA) Institute, 2020; Jones & Smith, 2007; Kenton, 2020a; Kieso et al., 2013; Lati & Naço, 2009; Murray, 2019a; Needles & Powers, 2009; Rich et al., 2013; Tardi, 2020; Weygandt et al., 2013; Williams et al., 2018).

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When the prices rise, especially under an inflationary environment, they affect the purchases made by the business. Furthermore, since the market prices increase, adopting the FIFO cost flow assumption becomes necessary as it puts lower costs to the COGS expense account, resulting in an increased remaining inventory cost. Having lower COGS results in an increased gross profit, and the amount of tax that a firm pays to the tax authorities is also greater (Bragg, 2018a, 2018b; Depersio, 2015; Gadge et al., 2013; Jones & Smith, 2007; Tardi, 2020). Indeed, regarding the other inventory cost flow assumptions, FIFO provides the highest net income, also referring to the case stated above (IFT, CFA Institute, 2020; Kenton,2020a, Needles & Powers, 2009; Rich et al., 2013; Smith, 2019). This method aligns with some firms' goals to maximize and have a high net income at the end of an accounting year. As a result, they can have the chance of any further investment in their businesses by interested potential investors. Ultimately, this causes the FIFO cost flow assumption to be more favorably adopted compared to the other mentioned inventory cost flow assumptions (Carlson, 2019; Weygandt et al., 2013; Williams et al., 2018).

Conversely, in a deflationary market, the purchase prices are lower. However, this results in a firm having a more considerable representative value of its COGS on its income statement. This happens because their cost was higher when the purchases were made than the current one. Furthermore, this results in a lower cost of ending inventory and gross profit for the end of the year, as well as a lower taxable income under which the business is taxed. All the respective values we get through the adoption of this inventory cost flow assumption are lower compared to the other assumptions (under deflation) (Bragg, 2018a; Gadge et al., 2013; Needles & Powers, 2009; Weygandt et al., 2013).

Last in, first Out Cost Flow Assumption (LIFO) is an inventory cost flow assumption that is based on the presumption that the latest raw materials or finished goods bought are the materials firstly used in the production process or might as well be the components and merchandise initially available for sale to the customers (Averkamp, 2020c; Bragg, 2019c; Depersio, 2015; Tun, 2019). As a result, the COGS on a firm's Income Statement at the end of an accounting period is calculated based on the newest products or materials sold. Whereas on its Statement of Financial Position, the closing inventory is valued based on the cost of the earliest goods acquired (Kieso et al., 2013; Rich et al., 2013; Smith, 2019; Tardi, 2020; Weygandt et al., 2013). Considering the case of market inflation, when the prices increase, adopting LIFO as an inventory cost flow assumption result in higher COGS for the firm based on the current market prices. Additionally, COGS is higher compared to the other inventory cost flow assumptions. At the end of a particular accounting period, the firm will face an increased cash flow (more significant revenues – greater costs) and will have lower gross profit, lower taxable income and the tax imposed to the firm, and lower ending inventory's cost value on hand (Bragg, 2018a; Carlson, 2019; Gadge et al., 2013; IFT, CFA Institute, 2020; Jones & Smith, 2007; Kenton, 2020a; Lati & Naço, 2009; Murray, 2020; Needles & Powers, 2009; Williams et al., 2018).

Regarding the aspects presented above, Weygandt et al. (2013) stated that IFRS does not allow the usage of the LIFO cost flow assumption because a firm benefits from it by paying lower taxes and having tax savings. Furthermore, the closing inventory's value at the end of an accounting year will be based on the cost of the earliest inventory acquired. The value will not correspond with the current market purchase prices and, consequently, does not show the exact financial position of the firm (Bragg, 2019c; Carlson, 2019; IFT, CFA Institute, 2020; Kieso et al., 2013; Smith, 2019; Tardi, 2020; Tun, 2018).

On the other hand, when a market faces deflation, the COGS presented in a firm's income statement at the end of a specific period is based on calculating the cost of the inventory sold at the current low market prices. It thus results in 1) a lower COGS than the one calculated using the FIFO or Weighted Average Cost (WAC) flow assumption.

Weighted Average Cost (WAC) is an inventory cost flow assumption where a weighted average unit cost is used to calculate the cost of the inventory sold and the cost of the ending inventory regarding a specific accounting period (Bragg, 2018d, 2020; Smith, 2019; Tardi, 2020; Tun, 2019; Tuovila, 2019). The weighted average unit cost must be estimated every time a firm purchases goods. This especially happens in a manufacturing firm, where the number of transactions is relatively high since it is affected by different factors such as goods' depreciation or changes in the customers' needs and preferences. This inventory cost flow assumption is called the "Moving Average Cost Flow Assumption" (Averkamp, 2020c; Jones & Smith, 2007; Kieso et al., 2013; Lati & Naço, 2009; Rich et al., 2013; Weygandt et al., 2013; Williams et al., 2018).

Additionally, there is a formula used to find the weighted average cost per product unit, as shown below:

Total Cost of the Goods Available for Sale ÷ Total Units Available for Sale = Weighted Average Unit Cost

Source: (Bragg, 2018d; CFA Institute, 2020; Kenton, 2020a; Lati & Naço, 2009; Rich et al., 2013; Tuovila, 2019; Weygandt et al.,2013; Williams et al.,2018).

When the market suffers from inflation (the prices are high) and adopts the inventory cost flow assumption mentioned above, a firm report on its COGS expense account a relatively higher cost value compared to the one obtained using the FIFO cost flow assumption and lower than the one from the LIFO cost flow assumption. Consequently, the taxable income based on which the company is taxed is lower than the income tax from the FIFO cost flow assumption but more significant than the one obtained from the LIFO cost flow

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assumption. Similarly, this inventory cost flow assumption has the same effect on the firm's net income. Nevertheless, the ending inventory's cost will be lower than the one found by the FIFO cost flow assumption and more significant than that found by the LIFO cost flow assumption. Whereas, in the case of a deflating market, the opposite of what we previously described happens (IFT, CFA Institute, 2020; Kenton, 2020a; Rich et al., 2013; Smith,2019; Tardi,2020; Weygandt et al., 2013).

III. METHODOLOGY

Regarding the methodology section of my research, the approach I have used is the qualitative one. The practical side will be based on the research method, a real case study of an actual manufacturing firm. This study takes accurate accounting data from the considered manufacturing company.

To begin with, the manufacturing industry is a broad term used to refer to all the businesses that deal with producing goods. In my research, I will quantitatively study a sofa manufacturing firm specializing in producing or selling readily bought furniture such as sofas, bed upholstery, mattresses, tables, chairs, kitchen furniture, bedroom furniture, and raw materials. Among all these products, I will focus my analysis on the sofas and their production process. As mentioned, this firm has been operating in the market for over 20 years. Additionally, the manufacturing firm studied has adopted the WAC flow assumption to value its inventory based on the cost for one accounting period. It has followed the same inventory cost flow assumption for many years.

Most importantly, my work aims to apply the pure theoretical concepts related to the inventory cost flow assumptions in the context of an existing, successful manufacturing firm. Ultimately, my goal is to discover which of these inventory cost flow assumptions is the most favorable and the most likely to be considered by a firm to value the inventory based on its cost. The superiority of an inventory cost flow assumption over the others will be determined based on its impact on the accounts of the firm's financial statements. The choice of an inventory cost flow assumption partially benefits the firm and the tax authorities. The data collected for one accounting year from the manufacturing firm studied (considered a primary source) is analyzed below. All the primary data will be used to conduct an in-depth empirical analysis.

In order to provide this analysis, I will consider the quantitative data of the manufacturing firm for the first quarter of 2023. The quantitative data is related to the 30 produced sofas, all of the same model, "Max Model" (3 Post Sofa), and which differ only in the textile color. Ten of them are with Louvre Forrest color, fifteen are with Louvre Champagne, and five are with Louvre Lavanda. I will calculate the cost of production for all 30 sofas of the mentioned model, considering the raw materials, the direct labor cost, and the manufacturing overhead expenses. To find the cost of the raw materials used, I have to adopt the inventory cost flow assumptions, such as LIFO and WAC.

The direct materials used to produce a sofa can vary. However, regarding this specific model, the "Max Model," the ones used are the respective textiles (Louvre Forrest, Louvre Champagne, Louvre Lavanda), fir boards, the foam, and the hollow fiber filler in specific amounts.

Before recording the entries of each of the direct materials purchased, I have to show their respective beginning inventory for 2023 as of 01.01.2023, the same as their ending inventory balance for the previous year, 2022.

Each direct material used in the production process is provided data regarding the quantity and price they are purchased. Then, the cost of a direct material can be found by multiplying the quantity by the purchase price. Since the firm does not buy the direct materials in the same amount, the cost of each direct material will change accordingly.

To begin with the textile as raw material, at the end of the accounting year 2019, the amount remaining in the inventory was 10,000 linear meters (ml) and had a purchase price of 3.9 Euro/ linear meter (€/ml). All three previously mentioned textiles have different colors but the exact purchase price. Moreover, the quantity, the purchase price, and the cost found by the multiplication of the previous two for every direct material are shown in the tables below. Table 1 contains the data for the textiles, Table 2 for the fir boards, and so on.

To find the cost based on the total amount of linear meters bought the cost of the textile as the direct material is found by multiplying the price in Euro with the quantity purchased at the specified date stated at the beginning of the same row in Table 1. Then, I add up all the separate costs found.

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Table 1. The textile's colors, their purchased quantity, the price, and the costs of the textile during the first three months of 2023.

Date	The textile color	Quantity (ml)	Price (€/ml)	Cost (Price x Quantity)
01.01.2023	Louvre Forrest	4,000 ml	3.7 €/ml	€ 14,800
	Louvre Champagne	4,000 ml	3.7 €/ml	€ 14,800
	Louvre Lavanda	2,000 ml	3.7 €/ml	€ 7,400
27.02.2023	Louvre Forrest	104.20 ml	3.8 €/ml	€ 395.96
	Louvre Champagne	156.20 ml	3.8 €/ml	€ 593.56
	Louvre Lavanda	53.30 ml	3.8 €/ml	€ 202.54
12.03.2023	Louvre Forrest	204.70 ml	3.9 €/ml	€ 798.33
	Louvre Champagne	217.20 ml	3.9 €/ml	€ 847.08
	Louvre Lavanda	154.30 ml	3.9 €/ml	€ 601.77
Total		**10,889.9 ml**		**€ 40,439.24**

Source: Author's Contribution

Based on the number of cubic meters bought, the cost of the fir board, as a direct material, is found by multiplying the price in Euro with the quantity purchased at the specified date stated at the beginning of the same row in Table 2. Total cost is found in the same way as in Table 1, by finding the sum of all the separate costs.

Table 2. The purchased quantity, the price, and the costs of fir boards during the first three months of 2023.

Date	Quantity (m^3)	Price (€/m^3)	Cost (Price x Quantity)
01.01.2023	1.00 m^3	230 €/m^3	€ 230
04.01.2023	0.09 m^3	230 €/m^3	€ 20.7
06.01.2023	1.60 m^3	230 €/m^3	€ 368
	3.50 m^3	230 €/m^3	€ 805
15.01.2023	2.69 m^3	232 €/m^3	€ 624.08
	0.21 m^3	232 €/m^3	€ 48.72
25.01.2023	2.40 m^3	234 €/m^3	€ 561.6
30.01.2023	0.17 m^3	234 €/m^3	€ 39.78
07.02.2023	2.50 m^3	235 €/m^3	€ 587.5
10.02.2023	0.13 m^3	235 €/m^3	€ 30.55
14.02.2023	0.22 m^3	235€/m^3	€ 51.70
17.02.2023	0.12 m^3	235 €/ m^3	€ 28.2
19.02.2023	3.50 m^3	235 €/m^3	€ 822.5
	4.00 m^3	235 €/m^3	€ 940
25.02.2023	0.12 m^3	237 €/m^3	€ 28.44
03.03.2023	0.23 m^3	240 €/m^3	€ 55.2
11.03.2023	0.25 m^3	240 €/m^3	€ 60
Total:	**22.73 m^3**		**€ 5,301.97**

Source: Author's Contribution

Following the same logic, to find the cost of the total amount for the kilograms of foam bought, the cost of this direct material is found by multiplying the price in Euro with the respective quantity purchased at the specified date stated at the beginning of the same row in Table 3. After that, I add up all these separate costs.

Table 3. The purchased quantity, the price, and the costs of foam during the first three months of 2023.

Date	Quantity (kg)	Price (€/kg)	Cost (Price x Quantity)
01.01.2023	1000 kg	2.6 €/kg	€ 2,600.00
07.01.2023	135.00 kg	2.7 €/kg	€ 364.50
	268.70 kg	2.7 €/kg	€ 725.49
	310.50 kg	2.7 €/kg	€ 838.35
16.01.2023	90.10 kg	2.8 €/kg	€ 252.28
	156.20 kg	2.8 €/kg	€ 437.36
	324.10 kg	2.8 €/kg	€ 907.48

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05.02.2023	511.40 kg 211.00 kg 168.60 kg	2.6 €/kg 2.6 €/kg 2.6 €/kg	€ 1,329.64 € 548.60 € 438.36
20.02.2023	437.50 kg	2.7€/kg	€ 1,181.25
09.03.2023	463.30 kg 364.50 kg	2.9 €/kg 2.9 €/kg	€ 1,343.57 € 1057.05
Total:	**4,229.9 kg**		**€ 12,023.93**

Source: Author's Contribution

For the kilograms bought of hollow fiber filler, the cost of this direct material can be found by multiplying the price in Euro with the quantity purchased at the specified date stated at the beginning of the same row in Table 4. Adding all the separate costs gives the final total cost.

Table 4. The purchased quantity, the price, and the costs of hollow fiber filler during the first three months of 2023.

Date	Quantity (kg)	Price (€/kg)	Cost (Price x Quantity)
01.01.2023	2,000 kg	0.5 €/kg	€ 1,000
01.02.2023	4,000 kg	0.8 €/kg	€ 3,200
01.03.2023	3,750 kg	1 €/kg	€ 3,750
Total:	**9,750 kg**		**€ 7,950**

Source: Author's Contribution

The represented data are regarding the purchases of each direct material used to produce a sofa, such as the "Max Model." In order to find the cost of the production process, first, I have to find the cost of the direct materials used. However, this cost changes due to the inventory cost flow assumption adopted.

To produce a "Max Model" sofa, 10 ml textile, 0.65 m³ fir board, 9.64 kg foam, and 10 kg hollow fiber filler are needed. In total, 30 produced sofas are taken into consideration. So, by multiplying the number of direct materials used for producing a sofa with the total number of sofas, I find out the amount of every direct material used for all 30 sofas.

Furthermore, based on the order followed by each inventory cost flow assumption, I will find the respective costs, considering how the direct materials leave the inventory. For further analysis, I will study the LIFO and WAC as inventory cost flow assumptions. I will start with the LIFO cost flow assumption and the textile as one of the most important materials of the sofa model. Among them, one aspect that should be considered is the variety in color, which will make the sofas different. The available colors are Louvre Forrest, Louvre Champagne, and Louvre Lavanda.

While adopting the LIFO cost flow assumption, the cost of the textile with a specific color will be based on the amount that is lastly purchased, as shown in Table 5 below. We must recall that the textile amount used for producing a sofa is ten linear meters respectively. Also, I mentioned that ten sofas would be produced with the Louvre Forrest, 15 with the Louvre Champagne, and five with Louvre Lavanda.

Table 5. The cost of the textile, by adopting the LIFO cost flow assumption.

Textile Color	Quantity (ml)	Price (€/ml)	Cost (Price x Quantity)
Louvre Forrest	100 ml	3.9 €/ml	€ 390
Louvre Champagne	150 ml	3.9 €/ml	€ 585
Louvre Lavanda	50 ml	3.9 €/ml	€ 195
Total:	**300 ml**		**€ 1,170**

Source: Author's Contribution

By adopting the LIFO cost flow assumption, since the last entry is for Louvre Lavanda, I will start by following the order of this inventory cost flow assumption. The order, as I have previously mentioned in the theoretical part, is that the newest direct materials purchased will be taken off from the inventory to be first used in production. Respectively, since five sofas were made with Louvre Lavanda from the latest quantity bought in this color, I will take 50 ml. After, because of 15 sofas with Louvre Champagne, I will take 150 ml from the respective second entry made. Same for the ten sofas in the Louvre Forrest, I will take 100 ml from the third, latest, respective quantity purchased. The total cost of the textile (Louvre, used in 3 different colors), acting as a direct material used in the production process, is €1,170. Likewise, I need to adopt the same order, as mentioned above, to the remaining direct materials, respectively, for the fir boards, the foam, and the hollow fiber filler. Focusing on

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the fir boards, I have to find the number of fir boards used in 30 sofa models. The following equation determines this amount: $0.65\frac{m^3}{sofa}\times 30$ sofas=19.5 m³. Then, by adopting the LIFO inventory cost flow assumption, the cost regarding a specific amount of fir boards purchased will be calculated by multiplying the quantity with the respective purchase price, as shown in Table 5 below. Then, the total cost of the used fir boards is found by adding up the costs of each specific purchase.

Table 6. The cost of the fir boards, by adopting the LIFO cost flow assumption.

Quantity (m³)	Price (€/m³)	Cost (Price x Quantity)
0.25 m³	240 €/m³	€ 60
0.23 m³	240 €/ m³	€ 55.2
0.12 m³	237 €/m³	€ 28.44
4.00 m³	235 €/m³	€ 940
3.50 m³	235 €/m³	€ 822.5
0.12 m³	235 €/m³	€ 28.2
0.22 m³	235 €/m³	€ 51.7
0.13 m³	235 €/m³	€ 30.55
2.50 m³	235 €/m³	€ 587.50
0.17 m³	234 €/m³	€ 39.78
2.40 m³	234 €/m³	€ 561.6
0.21 m³	232 €/m³	€ 48.72
2.69 m³	232 €/m³	€ 624.08
2.96 m³	230 €/m³	€ 680.80
Total: 19.5 m³		**€ 4,559.07**

Source: Author's Contribution

As previously mentioned, I need 19.5m³ fir boards to produce 30 sofas. Nevertheless, to find the cost of 19.5 m³ fir boards, I need to consider that the fir boards leaving first the Raw Materials Inventory will be those lastly entering into it. Taking as reference Table 2, where I showed the fir boards' entries, it can easily be observed that the last purchased fir board's amount is 0.25 m³. Knowing its purchase price at that specific date with a value of 240 €/ m³, I can find out the cost of the fir board, which is 60 €. Then, the second latest fir board was purchased again at 240 €/ m³, and its amount was 0.23 m³. The fir board amount is respective cost will be € 55.2. For other data, the same procedure is followed until the quantity reaches 19.5 m³. The overall cost of the fir boards used in the production process will be €4,559.07.

Additionally, I need to find the foam amount used in 30 sofa models. I can easily find it by applying the formula as follows $\frac{9.64kg}{sofa}\times 30$ sofas=289.2 kg.

By adopting the LIFO cost flow assumption, I will take the needed amount of foam from the last amount purchased, 364.50 kg, associated with the purchase price of 2.9 €/kg. Therefore, the cost of the foam used in the production process will be: 289.2 kg×2.9 $\frac{€}{kg}$ = € 838.68**.**

Then, the hollow fiber filler amount used in 30 sofa models can easily be found by the following formula: $\frac{10kg}{sofa}\times 30$ sofas=300 kg. I will consider this amount from the last hollow fiber purchase, which is 3,750 kg, associated with the purchase price of 1 €/ kg. Thus, the cost of the hollow fiber filler used in the production process will be: 300 kg×1 €/kg = € 300.

The overall cost of the direct materials found due to adopting the LIFO cost flow assumption is € 1,170 +€ 4,559.0 + € 838.68 + €300 or € 6,867.75.

After adopting the LIFO cost flow assumption, I will proceed by adopting the WAC flow assumption and finding out the overall cost of the direct materials used in the production process. For adopting the mentioned inventory cost flow assumption, I have to calculate the weighted average cost for each of the direct materials by applying the respective formula, the weighted average cost formula. The formula is the total cost of the direct material available for production divided by the amount available for production. Then the weighted average cost found through it will be multiplied by the respective direct material amount used for finding the cost of each direct material used in the process.

Starting with the textile, its amount available for use in production is 10,889.9 ml. Its cost, based on the amount available to be used in the process, is € 40,439.24. By dividing € 40,439.24 by 10,899.9 ml, I find out the weighted average cost for one linear meter of textile that is € 3.7135. Then, based on the total textile amount used in the production process, which is 300 ml, the overall cost of the textile will be: 3.7135 €/ml ×300ml= € 1,114.05.

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But the cost found is for 30 sofas in total, without making a difference in the textile color. Taking into consideration the textile color, for making 10 Max Model with Louvre Forrest, the cost of the textile will be 3.7135 €/ml ×100 ml= € 371.35, for 15 Max Model with Louvre Champagne, the cost of the textile will be 3.7135 €/ml ×150 ml= € 557.025 and for 5 Max Model with Louvre Lavanda the cost will be 3.7135 €/ml ×50ml= € 185.675. After adding them up, € 371.35 + € 557.025 + € 185.675, the total cost will be the same as the previous one, € 1,114.05.

Moreover, proceeding with the fir boards, the amount available for use in the production process is 22.73 m³. Its cost, based on the respective amount that is available for the manufacturing process, is € 5,301.97. By dividing € 5,301.97 by 22.73 m³, I found out the weighted average cost for one cubic meter of fir board, which is € 233.2587. There are 19.5 m³ to be used in the process. Moreover, by multiplying the weighted average cost per fir board by the amount required, I find the total cost of the fir board used for producing the 30 sofas, which is € 4,548.5447, respectively.

To find the cost of 289.2 kg of foam used in the production process, I need to find first, as previously stated, the weighted average cost for 1 kg of foam. So, the amount of foam available for use is 4,229.9 kg, and the cost based on this available amount is € 12,023.93. After dividing the € 12,026.252 by 4,229.9 kg, the weighted average cost per 1 kg of foam will be € 2.8426. This cost per 1 kg, multiplied with the amount of foam used in the production process, 289.2 kg, gives the overall cost of the foam, which is € 822.0799.

Lastly, to find the cost of the hollow fiber filler amount used to produce the 30 "Max Model" sofas, I divide the cost of the hollow fiber filler available for sale, € 7,950, by the overall amount of hollow fiber filler available, 9,750 kg. This results in the weighted average cost for one kilogram of hollow fiber filler, which is 0.8154 €/kg, respectively. Then, this cost for 1 kilogram of hollow fiber filler amount multiplied by the amount of hollow fiber filler used in the production process, which is 300 kg, gives the cost of the hollow fiber filler used, € 244.62 respectively. The overall cost of the direct materials found due to adopting the WAC flow assumption is € 1,114.05 + € 4,548.5447 + € 822.0799 + € 244.62 or € 6,729.2946.

For a better insight into the manufacturing process involving the debited or credited accounts, I will provide the necessary transactions showing the flow of costs incurred during a manufacturing process. Firstly, when the manufacturing firm purchases the raw materials (direct and indirect), it might buy them on the account because the cost of the raw materials is very high to be paid immediately in cash. This is why the parties (the buyer and the seller) agree on the time when the buyer will have to pay the money for the materials purchased. Until that moment, the buyer remains liable to the supplier.

What I mentioned above can be illustrated with the quantitative data taken as a reference for the study. So, under the LIFO cost flow assumption, the accountant on the buyer firm will debit the Raw Materials' Inventory Account containing direct materials with the respective cost amount of € 65,717.462 (€ 40,439.24 + € 5,301.97+€ 12,026.252 +€ 7,950) and indirect material with the respective cost of € 14.48. The indirect material is considered the lubricant, from which only the amount corresponding to € 8.67 is decided to be used. In total, the Raw Materials Inventory will be debited for € 65,731.942. The Accounts Payable will be credited with the same amount. The same transaction with the same accounts and amounts will be made if the firm adopts the WAC flow assumption.

Before illustrating in detail, the flow of costs under the adoption of each of the inventory cost flow assumptions, I have to add some information about the In-Process costs known as the WIP costs. Every employee in this manufacturing firm, directly or indirectly affecting the manufacturing process, is paid under the same salary. After making the necessary calculations, the dollar amount each employee is paid for each sofa produced is 8.06 €/ sofa. For 30 sofas, the cost of the direct labor and the indirect labor force will be each, by applying the respective formula $8.06\frac{€}{\text{sofa}}$ ×30 sofas= € 241.8 , specifically, € 242.

Furthermore, the cost of Other Manufacturing Overhead expenses (electricity, water) will be a fixed amount of € 484.

In the case that the firm adopts the LIFO cost flow assumption, the cost of the direct materials used is € 6,867.75, together with the cost of the indirect material used, € 8.67, their sum will increase the credit side of the Raw Materials Inventory by € 6,876.4. Thus, the direct materials cost will be credited in Raw Materials Inventory, and the same amount, € 6,867.75 will be debited in the Work in Process Inventory. Likewise, the cost of the indirect material, precisely € 8.67, will be credited to the Raw Materials Inventory, and the same amount of cost will be debited to the Manufacturing Overhead Expense account.

In adopting the WAC flow assumption, the Raw Materials Inventory will be credited by a total amount of € 6,737.9646 (€ 6,729.2946 because of the direct materials' cost and € 8.67 because of the indirect materials cost). The cost of the direct materials will increase the debit side of the Work in Process Inventory. In contrast, the cost of the indirect materials will increase the debit side of the Manufacturing Overhead Expenses account.

Regarding the direct and indirect labor costs, these costs will be credited to the Salaries and Wages Payable account. This account is used because, until the end of the month, the manufacturing firm remains liable to its employees. It is important to re-emphasize that an employee who acts directly or indirectly in the production process will be paid 8.06 €/sofa, and in total, € 242. The direct labor costs will then increase the debit side of the

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Work in Process account by € 242, and the indirect labor costs will increase the debit side of the Manufacturing Overhead Expense account by precisely the same amount. Regarding the Salaries and Wages Payable account, in total, it will be credited at the cost of € 484. The same flow will occur if the firm adopts the WAC flow assumption for the type of costs mentioned above.

For the costs included in the Other Overhead Expenses group with the amounts of € 484, the firm should record them on the Manufacturing Overhead Expenses account on the debit side and the credit side on the Utilities Payable account. Specifically, due to this cost, the Manufacturing Overhead Expenses account will increase its debit side by € 484, and exactly with the same amount, the Utilities Payable account will increase its credit side. The same transaction would occur if the firm adopted the WAC flow assumption.

The next step is to add up all the Manufacturing Overhead Expenses as actual expenses that the firm has planned for undergoing the production process, even though their effect is to contribute indirectly to it. After I add all the costs, specifically the Indirect Materials, Indirect Labor, and Other Manufacturing Overhead expenses with their specific amounts, I will find the total Manufacturing Overhead Expenses. By illustrating the following formula, its amount will be € 8.67 +€ 242+€ 484=€ 734.67. The exact amount of cost will be even if the firm adopts the LIFO or WAC flow assumption.

Since the firm will execute an effective and efficient production process, the amount of Manufacturing Overhead Expenses planned will be the same with the amount as the firm will make because of the indirect materials, indirect labor force, and other aspects included in the production process. So, the following transaction will consist of the Manufacturing Overhead Expenses credited by €734.67 and the Work in Process Inventory. The exact amount will be debited under the name The Overhead Applied.

I will take the case separately when the firm adopts the LIFO cost flow assumption and record the transaction mentioned above and when it adopts the WAC flow assumption to show the differences in the cost amount due to the firm's choice. Respectively, suppose the firm chooses to adopt the LIFO cost flow assumption. In that case, the Work in Process costs will consist of the Direct Materials cost, which amounts to € 6, 867.75, the direct labor cost of € 242, and the Overhead Applied expenses, which are € 734.67. After adding them, the total work-in-process cost will be € 7,844.42.

The following transaction recorded will consist of the cost previously found, € 7,844.42, which will increase the debit side of the Finished Goods Inventory account, as well as the credit side of the Work in Process Inventory, both under the name "Cost of Goods Manufactured."

In the scenario where all the sofas produced will be sold (all 30 sofas), the cost of the sofas manufactured, € 7,844.42 after the sale, will be converted to the cost of the goods sold under the same amount. Furthermore, the last transaction will be COGS, which will increase its debit side by € 7,844.42, and Finished Goods Inventory, which will increase its credit side by the same amount.

Now, the focus is if the firm adopts the WAC flow assumption. By adding all the specific accounts, as I previously mentioned, the total Work-In-Process cost will be € 7,705.9646. The other transactions will affect the same accounts as if the firm adopts the LIFO cost flow assumption but differs from it; under the WAC flow assumption, only the amount of cost changes. Lastly, the cost of one sofa sold, under the LIFO cost flow assumption, will be: € 7,844.42 ÷ 30 sofas = € 261.4807/sofa, while under the WAC flow assumption, will be € 7,705.9646 ÷ 30 sofas=€ 256.8655/sofa.

IV. DISCUSSION OF FINDINGS

Throughout the empirical analysis made, what I can conclude is that the COGS found through the adoption of the LIFO cost flow assumption, € 7,844.42 is greater than the COGS found by the other inventory cost flow assumption, WAC, that is € 7,706.14. The conclusion derived is according to what was explained in the theoretical background part due to the impact that the inventory cost flow assumptions, taken as reference, had on the COGS and the ending inventory. Apart from the COGS, the cost of the ending inventory will be also affected by adopting any of the referred inventory cost flow assumptions. To find the cost of the ending inventory for each direct material used, I had to add up all the costs of the remaining amounts (a direct material's available amount - its amount used in the process). Specifically, when the firm adopted the LIFO cost flow assumption, the cost of the textile ending inventory would be € 39,269.24, the cost of the fir boards € 742.9, the cost of the foam € 11,185.25, and the cost of the hollow fiber filler, € 7,650. And by adding up all these remaining costs, the overall costs of direct materials' ending inventory would be € 58,847.39. The cost found, together with the cost of the remained indirect material, that is € 5.81 (€ 14.48 - € 8.67), would give the total Raw Materials ending inventory's value that is, € 58,853.2.

Then, if the firm adopted the WAC flow assumption, calculating the total cost of the Raw Materials' ending inventory would change from the previous one because the weighted average cost per unit of each direct material would be multiplied by the respective remaining amounts. Respectively, the cost of the remaining textile would be € 39,325.59365, the cost of the fir boards, € 753.425601, the cost of the foam € 11,204.19824 and the cost of hollow fiber filler, € 7,705.53. So, after I added them up, the total cost of the Raw Materials' ending

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inventory would be € 58,988.7475. The prices at which is calculated the cost of the Raw Materials' Ending Inventory is nearly close to the cost based on the current prices that the raw materials are purchased in the market. What is clearly shown, following what the theory states, is that the cost of the Raw Materials' ending inventory, found by the adoption of LIFO cost flow assumption, € 58,853.2, is lower than that found by the adoption of WAC, € 58,988.7475.

V. CONCLUSION

To conclude, this research consists of answering three main questions:
1) Which are the accepted and the most adopted inventory cost flow assumptions under the Albanian accounting system?
2) Why is the LIFO cost flow assumption prohibited from valuing the inventory at its cost?
3) Which is the most favorably used inventory cost flow assumption?

Throughout the entire research, I concluded three inventory cost flow methods are accepted under the Albanian accounting system: The Specific Identification, First in, First Out, and Weighted Average Cost Flow Methods. Additionally, the most adopted inventory cost flow assumptions in the same system are the latter two. Furthermore, it was concluded that the LIFO cost flow assumption is prohibited because by providing a higher cost of the goods sold and higher cash flow, it lowers the amount of gross profit, the tax amount that a firm has to pay, and thus its net income generated during an accounting period. Moreover, WAC is the most favorable inventory cost flow assumption because it provides lower COGS, higher gross profit, net income, and an increased cost of the ending inventory, as it is also closer to the one found with the current market prices. However, what is most important of all, it is simpler to calculate the firm's COGS during a specific accounting period. It is also beneficial to the tax authorities since the amount of tax imposed on a firm is greater than the one it would have to pay if it adopts the LIFO cost flow assumption.

There is still some need for improvement and more future work to be done regarding this topic. That includes better practical work and more research on adopting inventory cost flow assumptions in various industry types and firms. With my research, I have contributed to the Albanian accounting system by providing them with a practical study of the adoption of inventory cost flow assumptions in a real manufacturing firm. Most importantly, this research is a pioneer of the practical work done on firms in Albania regarding the aspect of inventory cost flow assumptions. This can lead to future research and improvement of their adoption in different firms of other sectors as well, not only the manufacturing one that I have considered in this case.

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