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FACTORS AFFECTING THE ADOPTION OF INVENTORY COST FLOW METHOD BY THE MACEDONIAN COMPANIES: FIFO, WEIGHTED AVERAGE, AND SPECIFIC IDENTIFICATION METHOD

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ABSTRACT. Inventory valuation is a major topic in the accounting practice. Inventory valuation is reflected in financial reporting, i.e. the balance sheet and the profit and loss account and the choice of the right inventory cost flow method is one of the basic decisions all companies engaged in manufacturing and distribution of goods need to make. Preferably, the chosen method should result in the best income and financial result measurement. However, no method is acknowledged to always be the best for accomplishing these objectives.

The main aim of this paper is to investigate the factors affecting the adoption of inventory cost flow method by Macedonian companies. The data was collected by using a questionnaire randomly distributed via email to Macedonian retailing and manufacturing companies and later examined through statistical methods.

Analyzing a pool of 56 respondents, we find that the subject of inventory valuation is important as most of the participants consider that they understand the existing inventory valuation methods. The choice of inventory valuation method is mostly affected by the level of education of the manager, understanding of the method and simplicity of the separate inventory valuation methods.

Key words: *Inventory, valuation, methods, FIFO, weighted average, specific identification;*

JEL classification: M4, M1

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Introduction

Background of the study

Inventories are the finished goods or goods in different stages of production that a company keeps at its premises. There are various motives for keeping inventories depending on whether the inventory is designed for a process, for a flow of materials, or for a function it needs to achieve for an enterprise (Friberg *et al*., 2006). Inventory represents a large (if not largest) portion of assets of manufacturing firms and as such, makes up an important part of the balance sheet items (Pollard, Harrison and Mills, 2007). Therefore, it is very important to understand how inventory is valued. If monitoring and measurement of inventories is not given proper consideration, the feedback given to managers to help them make decisions regarding inventory issues is running the risk of being unreliable (Srikanth, 1996). Valuation of inventories is a major problem in the accounting practice. Accounting inventory is also reflected in financial reporting, i.e. the balance sheet and the profit and loss account. The choice of the right inventory cost flow method is a one of the basic decisions all companies engaged in manufacturing and distribution of goods need to make. Preferably, the chosen method should result in the best income and financial result measurement. However, no method is acknowledged to always be the best for accomplishing these objectives. The issue is not new, but might be considered as being insufficiently discussed by members of the accounting profession. This is the main reason because of which many researchers through the years examined the factors affecting the choice and adoption of inventory valuation methods, and also the reason why this particular subject was chosen for this study.

The choice of inventory valuation methods is not a minor issue. The method adopted is of vital importance to the firm since different procedures result in widely different valuations. The value of an inventory

depends on the valuation method used, such as first-in, first-out (FIFO) method, last-in, first-out (LIFO) method, weighted average (WAP) method and specific identification method. Therefore, choosing the inventory valuation method is one of the basic decisions all companies needs to make. Ideally, the method chosen should result in the best measure of a company's income and financial condition, but there is no one method that is always best for accomplishing this objective.

Statement of the problem

Companies have to consider which costs are going to be included in the pricing of materials when valuing inventories. For financial reasons it is very important for companies to know all the rules and regulations in the matter of this issue. Different inventory valuation methods can result with different costs of goods sold and by that differently affect the closing inventory figures. These differences are important because they affect the company's financial statements. As a result of the issues raised above, there is need for companies to choose the right valuation method, i.e. the valuation method that is the most suitable for the specific company.

The study's general aim is to determine whether Macedonian companies use different inventory valuation methods by doing a survey-based research, and which are the factors affecting the choice of the inventory valuation method. This research work is based on inventory valuation and reporting practices in Macedonian companies: superiority test between FIFO, WAP and specific identification method, evidence from selected Macedonian manufacturing and retailing companies. This results of the overall analysis will be significant to organizations in appropriately valuating and reporting inventory. So far, a specific study on this subject for Macedonian companies has not been conducted, so it will give recommendation in terms of effective inventory valuation based on local practices.

The article consists of five sections. This first section is introduction. It presents the subject of inventory valuation and states the aim and objectives of the paper. The second section presents the theoretical background of the study, through a literature review. The literature review covers current and previous theories and research about

inventory valuation and the factors that affect the choice of the method utilized. The third section covers the methodology of this research. It explains the design of the field research that was conducted through a questionnaire, the sample size and sample characteristics, including some statistics on the sample. The fourth section presents the results of the study, through the statistical methods of numerical and graphical presentation of data. The last part concludes the discussion and provides recommendations for future research.

Theoretical background

Overview of existing literature

According to Seitelman (1953) up to the middle of the nineteenth century, most businesses were not large and carried their inventories at cost and by the first-in, first-out method. However, the problem was with physical count and extension at the last invoice prices. Seitelman also says that several authors of accounting books believed the market value of an asset should not be ignored. In 1929, the American Institute of Accountants reaffirmed the lower of cost or market rule for inventory valuation and, later in 1943 according to replies of a survey made, it was evident there was agreement on application of the lower of cost or market value (Previts *et al.,* 2011).

In a 1985 study, Hunt evaluated the potential determinants of corporate inventory accounting decisions. According to the study, during period of rising prices, using LIFO inventory method can bring significant tax savings of several million dollars per firm. Thus, the tax savings are an important determinant of inventory method choice. However, many companies that could benefit of this choose not to do so, because of substantial opportunity costs associated with this choice.

Dopuch and Pincus, (1988) also say that firms tend to choose method which will result in the lowest expected present value of future tax payments. However, if potential tax savings from using LIFO are so large, the most US firms would have switched to LIFO, and this is not the case. Because of this they stress that this may not be the real reason and tend to look for nontax explanations.

Later, Arcelus and Trenholm (1991) are examining the choice behavior of firms in Canada, where restrictive tax laws remove taxes as the distinguishing valuation criterion. They classify methods into two categories, upon weather the method is intended to increase income (FIFO) or is income neutral (weighted average). They come to a finding that smaller firms tend towards income increasing inventory methods, while larger firms choose and income neutral method. This finding is parallel to the recommended amendment to IAS2, in which weighted average and FIFO are identified as preferred methods of assigning cost to inventories. However, they concluded that firms with similar characteristics are not selecting the same inventory valuation method, and potentially resulting in misleading comparisons.

Bar-Yosef and Sen (1992) identify an optimal inventory valuation method as a mixed strategy of using partly FIFO and LIFO but, conditions exist for either FIFO or LIFO to be used. This mixed policy can be interpreted by recognizing that the weighted average method would implement a particular mixed strategy. They also emphasize the effect of the acquisition cost on the firm's inventory accounting policy. A higher price increases tax advantages, but also increases the value of potential distortion due to inefficient purchasing. Thus, unlike many other authors, these two don't agree that at the time of rising prices, firms will necessarily shift to LIFO.

Cushing and LeClere (1992) compared long-time FIFO with long-time LIFO users to test variables expected to influence inventory method choice. The findings suggested that tax saving is the primary reason firms use LIFO. Also, other firms do not use LIFO because of numerous factors without a single dominant reason. Most of these factors decrease the potential tax saving from LIFO. They include LIFO layer liquidations, LIFO bookkeeping costs, declining production costs, and contradictory tax and financial reporting rules for inventory. However, other factors include effect on debt covenants, concern about the complexity of LIFO, and government requirements for FIFO use.

In a study by Kou (1993) the issue of inventory valuation method choice from the perspective of small firms and investigated three major factors believed to play an important role in small firms' inventory decisions. It was discovered, the hypothesis that highly leveraged firms more likely adopt FIFO is relevant for small as well as for large firms. The study also suggests that increase in business risk increases the tendency of the company

to use FIFO in order to reduce the chance of getting into a technical default. The significant relationship between size and LIFO choice indicates that political impact of high profits and the resulting negative wealth transfer, of concern to large firms, also concerns small firms. On the other hand, when size of small firms increases, an increase in business risk does not necessarily increase the tendency to use LIFO. Also, the findings suggest that small firms have a smaller chance of reporting extraordinarily high profits, thus a small firm's business risk does not interact with its size to influence the LIFO decision. Finally, the study predicted it is possible managerial ownership interest could influence inventory decisions, but contrary to this prediction, no significant relationship.

Later, Archambault and Archambault (1994) find that weighted average cost firms face lower inflation than FIFO firms, thus it implies that the firms with greatest tax advantage of using weighted average are using FIFO. However, the benefit of averaging highly variable costs may be important enough to offset the tax benefits received from using FIFO. Results suggest that weighted average is more frequently used than FIFO in industries based on commodities rather than manufacturing industries. Also, firms using average cost have higher variability in inventory, reported income and inflation rate. Another reason for management to choose the weighted average method is to make the firm appear less risky to investors, and that is because this method is the best cost flow assumption for reducing variability in income. In terms of size, weighted average firm are larger with a slower inventory turnover than FIFO firms.

Later, Ibarra (2008) made a study to determine if companies in different industries in the Philippines use different inventory valuation methods. It was found that companies preferred inventory methods vary based on the type of goods they manufacture or retail. The reasons considered by companies when choosing the type of inventory costing method were inventory obsolescence or subject to expiration, perishability of inventory, variability of inventory and unstable acquisition costs of inventory. However, companies did not consider tax savings in choosing the type of inventory costing they use. Companies engaged in manufacturing, retailing or distributing merchandise use FIFO; drug and medicine companies use either FIFO or weighted average; and most oil companies use the weighted average method. In terms of characteristics of inventories, companies whose inventories are subject to expiration and obsolescence or are

easily perishable use FIFO. When inventories are variable companies use either FIFO or weighted average and, when costs of acquiring inventories are not stable companies use the weighted average method.

In a study about the different effectiveness resulting from the choices of different inventory valuation method, Gu (2013) says, factors that should be considered when selecting inventory valuation method are the intrinsic characteristics of inventory and the influence on enterprise. He says that it is quite important to choose a method that corresponds to the characteristics of the inventories, hence when an enterprise's issuing and receiving of inventory is not frequent, there is no doubt that specific identification method is more accurate in inventory valuation. Contrary, when the enterprise has large amounts of inventory, and issuing and receiving is frequent, using this method can generate considerable workload and lead to greater cist and difficulties in managing inventory. In this case, it is better to use FIFO and weighted average method, which will simplify procedure and reduce the enterprise cost.

The second factor that should be taken into account in choosing the appropriate inventory valuation method is the influence on enterprises. Different methods have different degrees of influence on inventory balance and cost of sales, thus will influences the company's asset, profit, cash flow, financial ratios and tax issues. Also, it will influence the valuation of the operating performance among enterprises. Different valuation methods will result in different final inventory values, thus indirectly influence the enterprise operating performance.

Onoja Emmanuel and Abdullahi (2015) examined inventory practice and reporting in the Nigerian textile industry to find out whether firms tend to use FIFO or weighted average method. The study revealed that FIFO gives more realistic cost of closing stock and is simpler to understand and apply; therefore, it is preferred to weighted-average and other methods. Also, the study showed that as a result of weighted average method matching revenue against the average cost of inventory, the correct current economic value may not be reflected.

Niehaus (1989) examines the relationship between the chosen inventory method and ownership. The evidence shows that inventory choice is related to both managerial and outside ownership. When LIFO is the tax minimizing method, shareholders are likely to prefer the use of LIFO, but if manager's compensation is related to reported income, managers may prefer FIFO. Consequently, managers and shareholders can have conflicted

interests when LIFO is the tax minimizing method. Thus, probability of choosing LIFO increase with outside ownership concentration, which is likely to reduce agency problems by increasing level of monitoring. Other evidence from this study indicates the probability of choosing LIFO decreases as managerial ownership increases.

Legislation on inventories

Inventory in Macedonian companies is regulated under IAS 2. The international accounting standard - IAS 2 Inventories contains the requirements on how to account for most types of inventory. As per IAS 2, inventories ought to be measured at the lower of cost and net realizable value (NRV). Moreover, the standard provides as acceptable methods for cost valuation, specific identification (in some cases), first-in first-out (FIFO) and weighted average cost. The use of last-in first-out (LIFO) method is not permitted under IFRS. In December 2003 a revised version of IAS 2 was issued and started to be applied to annual reports beginning on or after 1 January 2005 (Iasplus, 2018).

The main purpose of IAS 2 is to prescribe the accounting treatment for inventories. The standard provides guidance for determining the cost of inventories and for subsequently recognizing an expense, including any write-down to net realizable value. It also gives directions on the cost formulas that are used to assign costs to inventories. The main principle of the standard is that inventories are required to be stated at the lower of cost and net realizable value (NRV).

Inventories include resources held for sale in the ordinary course of business (completed goods), for example, stock obtained by a retailer and held for resale, or land and other property held for resale. Inventories also encompass finished goods produced, or work in progress being produced, by the organization and include materials and supplies waiting to be used in the production process. The expense of inventories will involve all expenses of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition.

Should items not be interchangeable in the normal course of operations, goods or services produced and segregated for specific projects need to be assigned by using specific identification of their individual costs. Specific identification of cost implies that particular expenses are credited

and attributed to specifically identified items of inventory. This is the proper treatment for items that are segregated for a specific project, regardless of whether they have been purchased or produced. However, specific identification of costs is unseemly to be used when there are vast quantities of items of stock that are ordinarily interchangeable.

In such conditions, the method of selecting those items that remain on stock could be utilized to obtain predicted impact on profit or loss. Other that the specific identification method the cost of inventories, shall be assigned by using the first-in, first-out (FIFO) or weighted average cost formula. An organization should use the same cost formula for all stock having a similar nature and use to the entity. For inventories with a different nature or use, different cost formulas may be used. For instance, inventories used in one department might have a different use to the organization from the same type of inventories used in another operating department.

However, a distinction in geographical location of inventories (or in the respective tax rules), by itself, is not sufficient to legitimize the use of different cost formulas. The FIFO formula assumes that the things of stock that were bought or created first are sold first, and subsequently the things staying in stock toward the finish of the period are those that are last acquired or created. Under the weighted average cost formula, the cost of each item is determined from the weighted average of the cost of similar items at the start of a period and the cost of similar items obtained or created during the period. The average may be computed on a periodic basis, or as each additional purchase is received, depending upon the conditions in the entity.

The cost of inventories may not be recoverable if those inventories are in any way damaged, have become entirely or partially out of date, or if their selling prices have decreased. The cost of inventories may likewise not be recoverable if the approximated costs of completion or the expected costs to be incurred to make the sale have enlarged. The practice of writing inventories down below cost to net realizable value is in consistence with the opinion that assets should not be carried in excess of amounts likely to be acknowledged from their sale or utilization.

At the point when inventories are sold, the carrying amount of those inventories should be recognized as an expense in the period in which the related income is recognized. The volume of any write-down of stock to net realizable value and all losses of stock should be recognized as an expense in the period the write-down or loss occurs. The amount of any reversal of

any write-down of inventories, emerging from a rise in net realizable value, should be recognized as a decrease in the amount of inventories recognized as an expense in the period in which the reversal occurs.

Research methodology

Based on the comprehensive literature review in the domain of inventory valuation, the aim of this analysis is to evaluate, by using quantitative techniques, whether the choice of inventory valuation method depends on the firm and inventory characteristics. The main goal is to statistically analyze and determine which of the observed factors significantly affect the company's choice of inventory valuation method. This will be achieved by doing descriptive analysis (frequency, percentiles, central tendency, standard scores) and correlational analysis (correlation and regression) of the data collected from 56 Macedonian companies, using the SPSS software.

In the first part of the chapter, the research design will be explained, along with the research objectives and research hypotheses. In the second part the research strategy is explained. The data analysis will be conducted by using parametric and non-parametric tests.

Research objectives and hypotheses

The purpose of the field research was to explore whether Macedonian companies use different inventory valuation methods, and which are the factors affecting the choice of the inventory valuation method. The specific objectives previously mentioned are determining to what extent companies are familiar with existing inventory valuation methods, identifying the factors associated with the choice of inventory valuation method, comparing our findings with existing literature and giving recommendation in terms of choosing the most suitable inventory valuation method.

In order to assist in achieving the objective of the study the following hypotheses are formulated in order to provide for statistical test:

Hypothesis on managers' level of education

Insufficient education of the responsible person can lead to the company not choosing to use the most suitable inventory valuation method. (Ibarra 2008) Also most probably, employees with lower education will

have less knowledge of the existing inventory valuation methods. As stated previously, the specific identification method is a common practice for firms with rather unique inventory items of high-value such as vehicles, artwork, jewelry and custom-made furniture. (Anthony *et al*., 2003) This method connects specific items to their specific costs. Therefore, this method is more time consuming, expensive and requires specific knowledge to be utilized and by it the most sophisticated inventory valuation method. This leads to the expectation that higher educated managers will choose to use more sophisticated methods and opposite, managers with lower education will choose to use simpler methods.

Hypothesis 1:

H0: There is no significant association between employee's level of education and the choice of inventory

H1: There is a significant association between employee's level of education and the choice of inventory

Hypothesis on company size

Size of the firm has been used in other studies of inventory choice for various reasons. Firms may choose to use the LIFO inventory method to reduce reported accounting income and thereby avoid the appearance of monopolistic behavior. In addition, larger firms may be in a better position to benefit from the use of LIFO and to bear any increased costs that this inventory accounting system requires. (Craycraft *et al*. 1998) Kuo (1993) examined the factors affecting the choice of inventory method in small companies in United States. He concluded that as the size of a company increased, as measured by total sales, it is more likely that the company would use LIFO, while an upsurge in the debt to equity ratio had a contrary effect. Companies would tend to choose an income increasing method when debt is increased probably due to the covenants placed in their debt contracts. All these findings lead to the following hypothesis.

Hypothesis 2:

H0: There is no significant association between the size of a company and the choice of inventory method

H1: There is a significant association between the size of a company and the choice of inventory method

Hypothesis on ownership

A study by Craycraft *et al*. (1998) on U.S. companies shows that the level of foreign operations influences the choice of inventory accounting methods for domestic inventories. Firms with foreign operations make different choices regarding the inventory method used for their U.S. inventory than firms without foreign operations. Firms with significant levels of foreign operations are hypothesized to be more likely to use a non-LIFO inventory method. This means that all of the existing inventory methods are likely to be used by foreign owned companies. One of the IFRS aims is to augment investor comparability of companies by embracing one set of accounting standards. Gu (2013) in his study on inventory valuation methods says that the FIFO method is more suitable for actual flow of inventory and makes the balance of the inventory closer to the market value. However, he found that the actual usage of the FIFO method is less frequent than of the weighted average method. Therefore, the next hypothesis is as follows.

Hypothesis 3:

H0: There is no significant association between Ownership and the choice of inventory method

H1: There is a significant association between Ownership and the choice of inventory method

Hypothesis on nature of business

Ibarra (2008) found that the choice of ending inventory valuation is not affected or dictated by the company's nature of business. The two variables appear to be independent of each other. Unlike this The American Institute of Certified Public Accountants' Accounting Trends and Techniques (1990) has consistently found the adoption of LIFO to be strongly affected by industry classification. Firms within an industry tend to use the same accounting practices. In our case it is expected that manufacturing companies will probably use the specific identification but only if the nature of their business is production of large or more complex products. Therefore, the next hypothesis is on whether there is association between choice of inventory method and the nature of the business.

Hypothesis 4:

H0: There is no significant association between Business Nature and the choice of inventory method

H1: There is a significant association between Business Nature and the choice of inventory method

Hypothesis on importance of inventory valuation

It is very important for the company to choose to most suitable inventory valuation method. The specific identification method of inventory costing revolves around linking the actual cost to an identifiable unit of merchandise. This method is particularly easy to adopt when purchasing and selling bulky inventories such as vehicles. The study of Onoja Emmanuel and Abdullahi (2015) revealed that FIFO gives more realistic picture of company's inventory and is simpler to understand and apply, and therefore is preferred by smaller companies which shows that every inventory valuation method has advantages if it is correctly chosen for the company. This leads to the assumption that inventory importance is in association with the choice of inventory valuation method, thus the following hypothesis.

Hypothesis 5:

H0: The choice of inventory method is independent of the importance of Inventory Valuation.

H1: The choice of inventory method adopted depends on the importance of Inventory Valuation.

Hypothesis on understanding inventory valuation methods

It has to be taken into consideration that there are as well, disadvantages of each method and not choosing a suitable method may harm the company. For example, the main disadvantage of the specific identification method is that management can easily manipulate ending inventory cost, since they can choose to report that cheaper were sold first, ultimately raising income. Then again, managers may opt for reporting lower income, reducing taxes that need to be paid. From a theoretical point of view, this is the best technique as it relates the ending inventories directly to their specific purchase price. In a 2013 study by Gu on Chinese companies in 2005 only around 7% of the companies use the specific identification

method and this number additionally decreases to 5% in the next four years. The reason for this is probably the fact that if the enterprise has large amounts of inventory with great varieties, and the issuing and receiving is frequent, using specific identification method can generate considerable workload. Inevitably, it will lead to greater cost and make it difficult to manage inventory. Having adequate knowledge of the methods and understanding each separate method helps the company to choose the right inventory valuation method; therefore, understanding of the methods was put into correlation with the choice of the inventory method in the next hypothesis.

Hypothesis 6:

H0: The understanding of the method is not related to the choice of an inventory valuation method used.

H1: The understanding of the method is related to the choice of an inventory valuation method used.

Hypothesis on inventory system used

For the purpose of inventory management, normally companies may adopt to account for and operate inventories either based on a perpetual or periodic inventory system. In perpetual system of inventory, it is required to update the status of inventory accounts every time the company makes any change in the inventory. This is usually more time consuming and costly. Compared to perpetual system, the periodic inventory system is less intense, less accurate and does require the entire inventory status after a few weeks or months. Accountants have to create a separate record of inventory from the available records and compare it with the physical/actual inventory balance. This may require some major adjustments to correct the differences between the two balances. The difference in these two methods is that through periodic system inventory balance is disclosed as 'what is in hand', while through perpetual system, the same is disclosed as 'what should be on hand'. (Verma, 2015) It is expected that companies that use the periodical inventory system which is considered to be simpler, will use simpler inventory valuation method like FIFO. Therefore, the next hypothesis follows.

Hypothesis 7:

H0: The choice of Inventory Method does not depend on the Inventory System

H1: The choice of Inventory Method depends on the Inventory System. Hypothesis on simplicity of use

Wood and Sangster 2008 give a few main factors that affect the choice of inventory valuation method. One of the reasons is convenience, which means that companies choose the particular inventory method because it is the easiest method. In a study by Mosa et al., 2013 it was found out that FIFO is used because it is easy to implement and exercise on all types of inventory and opposite of this weighted average was not used because there was a lack of knowledge of its implementation. This leads to the following assumption.

Hypothesis 8:

H0: The choice of Inventory Valuation Method does not depend on its simplicity of use

H1: The choice of Inventory Method depends on its simplicity of use. Hypothesis on choice made by industry peers

Wood and Sangster 2008 as another main reason give custom, and this means that companies will choose to use the same inventory method that is used by other companies in the same industry. As an example, here we can point the study by Li and Sun, 2014 where they found that companies in the oil industry most commonly use the LIFO inventory valuation method. In another study by Onoja Emmanuel and Abdullahi (2015) on inventory valuation methods in Nigerian textile industries it was found out that most companies included in the research were utilizing the FIFO method, therefore, the above reason is once again confirmed. This leads to the assumption that the choice of inventory valuation method of industry peers has in fact big impact on the choice of inventory valuation method utilized by the company.

Hypothesis 9:

H0: The choice of Inventory Method is correlated with the choice made by industry peers.

H1: The choice of Inventory Method is not correlated with the choice made by industry peers.

Hypothesis on accuracy of inventory method

Onoja Emmanuel and Abdullahi (2015) also revealed in their study that the FIFO inventory valuation method gives more realistic cost of closing stock and as such is more superior to weighted average method. Li and Sun (2014) found out that manufacturing companies gradually switched from LIFO to FIFO inventory valuation method, and the main reason for this was the nonrealistic inventory values provided by the LIFO inventory method. The previous findings lead to the following hypothesis

Hypothesis 10:

H0: The choice of Inventory Valuation Method does not depend on the perceived inventory evaluation accuracy.

H1: The choice of Inventory Valuation Method depends on the perceived inventory evaluation accuracy.

Hypothesis on inventory characteristics – Inventory obsolescence

Obsolete inventory refers to the inventory that is at the end of its life cycle. This is the inventory that has not been sold or used for a long period of time and it is not expected to be sold in the future. Obsolete inventory is that part of existing inventory which cannot be either used (raw materials) or sold (finished goods). (Verma, 2015) Another name for obsolete inventory is dead inventory or excess inventory. This type of inventory must be written down and can cause losses for a company. In a study made on Philippines companies results show that companies whose inventories are subject to obsolescence or expiration use the FIFO which was opposite of the expected result. When inventory is subject to expiration the tendency is for the buyers to purchase the most recent product, so it is assumed that the ending inventory will be the cost of products purchased earlier or LIFO is applicable. (Ibarra, 2008) Verma also says that most of the companies with this kind of inventory use FIFO method since it is simple and results in older inventory being sold-out first, which in turn reduces the chances of writing off the obsolete inventory. This leads to the next hypothesis.

Hypothesis 11:

H0: The choice of Inventory Valuation Method does not depend on whether the inventories are obsolescent or not.

H1: The choice of Inventory Valuation Method depends whether the inventories are obsolescent or not.

Hypothesis on inventory characteristics – Stability of inventory acquisition cost

There are some costs that come with inventory. These costs are the results of ordering and holding inventory. Such as: purchasing cost, space available, labor cost, and possibility of deterioration and risk of theft (Muller, 2003). The assumption that volatile acquisition cost of inventory or unstable prices will make a company use weighted average for easier recording was confirmed. Majority of the Philipinian companies consider unstable cost (60%) in acquiring their inventories as the major reason in choosing the weighted average method. At time intervals when acquisition costs become uncertain, this technique is simpler and safer in terms of estimating ending inventory. That is, the weighted average method will neither overvalue nor undervalue the bottom line result. (Ibarra, 2008) Thus, the choice of inventory valuation method is put into correlation with weather costs of acquisition are stable or not.

Hypothesis 12:

H0: The choice of Inventory Valuation Method does not depend on whether costs are stable or not.

H1: The choice of Inventory Valuation Method depends on whether the costs are stable or not.

Hypothesis on inventory characteristics – Inventory variability

Ibarra (2008) assumed that numerous inventories will make a company use the weighted average for easier recording and management. Businesses engaged in manufacturing, retailing and distribution of goods are divided between obsolescence and variability of their inventories as their rationale in choosing FIFO twenty percent use the weighted average method due to perishability of goods and other twenty percent due to variability of their products. Because of this we assume that inventory variability has influence on the choice of inventory valuation method.

Hypothesis 13:

H0: The choice of Inventory Valuation Method does not depend on Inventory Variability

H1: The choice of Inventory Valuation Method depends on Inventory Variability

Hypothesis on inventory characteristics – Inventory perishability

As merchandise can be subject to decay, the seller will first sell items that were produced or purchased at an earlier date. Hence, one can assume that ending inventory will represent the cost of the newest stock items, i.e. that FIFO inventory technique is used by the seller. This corresponded to the results from the above-mentioned study by Ibarra (2008) which were that companies consider perishability (56.2%) of their inventories as the major reason in choosing the FIFO inventory method. Entities operating in the food, drugs and medicine industries consider perishability or useful life of their merchandises as the main reason for considering FIFO. This is not surprising since their products are mostly consumables and are highly susceptible to spoilage. Enterprises believe that this method will follow the actual flow of goods from the warehouse to the sales point. Moreover, entities believe that FIFO gives the most precise estimate of the costs of ending inventories. Rao (2011) also argues that the use of FIFO method is specifically suitable if the inventory items are of a perishable nature. The previous findings lead to the assumption that perishability as an inventory characteristic is affecting the choice of inventory valuation method.

Hypothesis 14:

H0: The choice of Inventory Valuation Method does not depend on whether Inventory is perishable or not.

H1: The choice of Inventory Valuation Method depends depend on whether Inventory is perishable or not.

Methods and sample of data collection

The questionnaire design was adopted for the purpose of the study. The population of this study is made up of Macedonian retailing and manufacturing companies. The method of sampling that was employed in obtaining required data is the random sampling method. Descriptive method of statistical data analysis is used for testing percentiles and frequencies and the hypothesis are tested using correlation analysis. (Crosstabs – Chi-square tests for independence) This is achieved using the SPSS software program as a main tool for analyzing the collected data.

The questionnaire administered to the selected respondents consist 12 questions of two types:

- Multiple - choice questions, with possibility to choose from a predetermined response list.
- Likert - type questions, used to indicate level of agreement or disagreement in social science research.

The questionnaire was specifically designed to examine entity characteristics and how they are affecting the choice of inventory cost flow methods. The questions provide information on entity type, size, inventory system, nature of business, education degree of the responsible person, as well as the main question of what method does the company utilize. Then the results were put into correlation to find out how each of the factors is affecting the choice of the inventory cost flow method. The main form of the questionnaire was adopted from one study on inventory valuations practice and reporting in Nigerian textile industries. (Abdullahi, 2015) The questions were modified to be suitable for testing the hypothesis of this study.

The questionnaire that forms the basis of the empirical research in this study consists of the following three parts: company characteristics, knowledge of inventory valuation methods and characteristics of inventories. The first part contains four questions related to general information. The first question is related to the education level of the manager. The second question is related to the size of the company and here the classification is made according to the number of employees according to the Macedonian legislation where micro entities employ up to 10 employees, small entities employ up to 50 employees, medium enterprises employ up to 250 workers, whereas large entities go beyond this figure (apprm.gov.mk, 2020). This classification was considered to be the easiest for the respondents to answer. The third question is related to ownership meaning if the company is domestic or foreign owned. And the last question is for the nature of the business. The respondents are given the possibility to choose between service, merchandise or production business. All the questions in this part are multiple choice questions with one possible answer.

The second part consists of seven questions. This part helps us to define weather participants in the survey understand the inventory valuation method. Here we have two types of questions: Likert - type

questions, used to indicate level of agreement or disagreement in social science research and multiple-choice questions. The first four of the seven questions in this part are Likert - type questions and are related to the understanding of the inventory valuation methods. The measure of central tendencies in SPSS will be used to analyses these questions. The respondent is given a statement and the possibility to agree stay neutral or disagree with it. The next questions are related to the inventory method and the reasons why the company uses this particular method. For the second question more than one answer is possible. The last question from this part is connected to the inventory system the company uses and the possible answers are periodical or perpetual.

In the last part of the questionnaire the inventory characteristics are examined. The participants are asked to describe their inventories by selecting from the given characteristics. For this question it was expected that multiple answers would be chosen by respondents when describing the inventories in their company.

Before sending out to respondents, the questionnaire was tested on a few chosen subjects to make sure everything was correctly understood, and corrections were made according to the received feedback. After the corrections, the questionnaire was tested again on a few more different subjects and it was concluded that there was no need for additional corrections to be made.

The collection of the data from the survey began in March 2018, following the financial year end. This period was chosen not randomly but to be able to get a higher rate of responses from potential respondents. If the data collection had begun in the period of closing the financial year, there was a big possibility that the response rate would be significantly lower. Using the random sampling technique, the questionnaire was delivered to one hundred and seventy-four (174) respondents. The survey was distributed via e-mail and was accessible through an internet link which was active for two weeks. The potential respondents were randomly chosen from companies operating on the territory of North Macedonia and there were no significant criteria for inclusion in the study. The number of retrieved questionnaires was 56 from the total of 174 questionnaires distributed. This figure represents about 32 percent response rate which is a good representation.

Descriptive statistics

The test sample is comprised of 56 companies and the percentiles and frequencies of the gathered data are presented below.

The table below shows that 19.6% of the company's representatives are high school graduates, 8.9% of them have some college, without a degree, 26.8% have master's degree or higher and 44,6% of them have a bachelor's degree.

Table 1. Percentiles and frequency of education

		Frequency	Percent
Valid	**High school graduate**	11	19.6
	Some college. no degree	5	8.9
	Bachelor's degree	25	44.6
	Master's degree or higher	15	26.8
	Total	56	100.0

Table 2 shows that highest percentage (39.3%) or 22 out of 56 companies are micro or have up to 10 employees. 16 companies are small or have up to 50 employees. 8 companies are medium and have up to 250 employees and 10 companies are classified as large or have more than 250 employees.

Table 2. Percentiles and frequency of size

		Frequency	Percent
Valid	**Micro**	22	39.3
	Small	16	28.6
	Medium	8	14.3
	Large	10	17.9
	Total	56	100.0

In table 3 we can see that 83.9% of all companies are in dominant domestic ownership. Only 8 out of the 56 companies are foreign owned and this makes 14.3% of all companies. Finally, only one company is equally domestic and foreign owned.

Table 3. Percentiles and frequency of ownership

		Frequency	Percent
Valid	**Dominant domestic**	47	83,9
	Dominant foreign	8	14,3
	Equally domestic and foreign	1	1,8
	Total	56	100,0

More than a half of the surveyed companies (55.4%) are in the retail business. The number of companies in the production business is 18 and only 7 companies are service businesses. (Table 4)

Table 4. Percentiles and frequency of business nature

		Frequency	Percent
Valid	**Services**	7	12.5
	Retail	31	55.4
	Production	18	32.1
	Total	56	100.0

Table 5 shows that 25 companies use the Periodical inventory system and his means that the company calculates the cost per unit at the end of each financial period and 31 companies use the perpetual inventory system which means that the costs per unit are calculated after each purchase is made.

Table 5. Percentiles and frequency of inventory system

		Frequency	Percent
Valid	**Periodical**	25	44.6
	Perpetual	31	55.4
	Total	56	100.0

One of the most important variables from our study is the method of inventory valuation that the company utilizes. 18 of 56 companies use the FIFO method. 27 of 56 companies use the weighted average method and the remaining 11 use the specific identification method. (Table 6) This will later be put into correlation with other variables to find out which factors have the highest influence on the choice of the inventory valuation method.

Table 6. Percentiles and frequency of inventory valuation method

		Frequency	Percent
Valid	**FIFO**	18	32.1
	Weighted average	27	48.2
	Specific identification	11	19.6
	Total	56	100.0

Research findings

This chapter presents the main findings from our analysis. The results are going to be interpreted separately for each given hypothesis. As it is previously mentioned the hypotheses of the study are tested using Multinomial logistic regression and Pearson's chi-square test.

The main objective of the study was to find out which factors are affecting the choice of the inventory valuation method that is utilized in the company.

For testing of the first hypothesis, employee's level of education and the choice of inventory valuation method were put into correlation. These are two nominal variables: level of education and inventory valuation method therefore, we are using the Pearson's chi-square test.

Hypothesis 1:

H0: There is no significant association between employee's level of education and the choice of inventory valuation method

H1: There is a significant association between employee's level of education and the choice of inventory valuation method

Table 7. H1 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.321a	4	.010
Likelihood Ratio	13.115	4	.011
Linear-by-Linear Association	2.368	1	.124
N of Valid Cases	56		

a. 4 cells (44.4%) have expected count less than 5. The minimum expected count is 2.95.

Given that p – value is 0.010, which is less than 0.05 (alpha level), H0 is rejected. Then, we can conclude that there is a statistically significant association between the education of the employee and the choice of inventory valuation method, therefore the tested hypothesis is accepted.

Table 8. H1 - Education * Inventory Method Cross-tabulation

		Inventory Method			Total
		FIFO	Weighted average	Specific identification	
High school graduate	Count	6	4	6	16
	% of Total	10.7%	7.1%	10.7%	28.6%
Bachelor's degree	Count	4	18	3	25
	% of Total	7.1%	32.1%	5.4%	44.6%
Master's degree	Count	8	5	2	15
	% of Total	14.3%	8.9%	3.6%	26.8%
Total	Count	18	27	11	56
	% of Total	32.1%	48.2%	19.6%	100.0%

The results of this test present the adoption of inventory valuation method by managers, with different level of education. Managers with a high school diploma are equally choosing between FIFO and Specific identification method. Managers with a bachelor's degree prefer the weighted average method, with 18 of the 27 respondents who chose Weighted Average method being in the category of bachelor's degree, and managers with a master's degree prefer the FIFO method of inventory valuation.

Hypothesis 2:

H0: There is no significant association between the size of a company and the choice of inventory method

H1: There is a significant association between the size of a company and the choice of inventory method

For testing of the second hypothesis, company size and the choice of inventory valuation method were put into correlation. These are two nominal variables: size and inventory valuation method therefore, we are using the Pearson's chi-square test.

Table 9. H2 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.094a	6	.168
Likelihood Ratio	11.905	6	.064
Linear-by-Linear Association	2.962	1	.085
N of Valid Cases	56		

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is 1.57.

With a p – value of 0.168, the H0 is not rejected. This value of p tells us that there is no statistically significant association between the size of the company and the choice of Inventory Method.

Table 10. H2 - Size * Inventory Method Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identification	
Size	Micro	Count	6	8	8	22
		% of Total	10.7%	14.3%	14.3%	39.3%
	Small	Count	6	7	3	16
		% of Total	10.7%	12.5%	5.4%	28.6%
	Medium	Count	3	5	0	8
		% of Total	5.4%	8.9%	0.0%	14.3%
	Large	Count	3	7	0	10
		% of Total	5.4%	12.5%	0.0%	17.9%
Total		Count	18	27	11	56
		% of Total	32.1%	48.2%	19.6%	100.0%

The results of this test present the adoption of inventory valuation method within different sized companies. Medium and large companies prefer the weighted average method of inventory valuation. Small companies are almost equally choosing the weighted average and FIFO methods. Micro companies have the most even distribution of inventory method utilized. On the first place is the specific identification method and weighted average method and not far behind is the FIFO method of inventory valuation.

Hypothesis 3:

H0: There is no significant association between Ownership and the choice of inventory method

H1: There is a significant association between Ownership and the choice of inventory method

For testing of the following hypothesis again the Pearson's chi-square test was used. Ownership and the choice of inventory valuation method were put into correlation. These are two nominal variables: ownership and inventory valuation method.

Table 11. H3 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.218a	4	.125
Likelihood Ratio	7.790	4	.100
Linear-by-Linear Association	.299	1	.584
N of Valid Cases	56		

a. 6 cells (66.7%) have expected count less than 5. The minimum expected count is, 20.

The p – value from the Pearson Chi-Square test on this hypothesis is 0.125, i.e. there is no statistically significant association between Ownership and choice of inventory method. Therefore, the tested hypothesis is rejected.

Table 12. H3 - Ownership * Inventory Method Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identification	
Ownership	Dominant domestic	Count	16	21	10	47
		% of Total	28.6%	37.5%	17.9%	83.9%
	Dominant foreign	Count	2	6	0	8
		% of Total	3.6%	10.7%	0.0%	14.3%
	Equally domestic and foreign	Count	0	0	1	1
		% of Total	0.0%	0.0%	1.8%	1.8%
Total		Count	18	27	11	56
		% of Total	32.1%	48.2%	19.6%	100.0%

The results of this test present the adoption of inventory valuation method within domestic and foreign owned companies. Foreign owned companies prefer the weighted average method and the domestic owned companies have more even distribution between. Most used by domestic companies is the weighted average method, followed by FIFO and in the end the specific identification method of inventory valuation.

Hypothesis 4:

H0: There is no significant association between Business Nature and the choice of inventory method

H1: There is a significant association between Business Nature and the choice of inventory method

For testing this hypothesis, business nature and the choice of inventory valuation method were put into correlation. These are two nominal variables: business nature and inventory valuation method therefore, we are using the Pearson's **chi-square test.**

Table 13. H4 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.081a	4	.395
Likelihood Ratio	4.176	4	.383
Linear-by-Linear Association	.012	1	.913
N of Valid Cases	56		

a. 4 cells (44,4%) have expected count less than 5. The minimum expected count is 1,38.

From the Pearson Chi-Square we can see that p – value is 0.395. This value of p tells us that there is no statistically significant association between business nature and the choice of inventory valuation method, therefore the tested hypothesis is rejected.

The results of this test show that companies that are in service business equally prefer each of the three methods. Merchandise companies are choosing between FIFO and weighted average method. Finally, companies that are in the production business prefer the weighted average method of inventory valuation.

Table 14. H4 – Business Nature * Inventory Method Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identification	
Business Nature	Services	Count	3	2	2	7
		% of Total	5.4%	3.6%	3.6%	12.5%
	Merchandise	Count	11	13	7	31
		% of Total	19.6%	23.2%	12.5%	55.4%
	Production	Count	4	12	2	18
		% of Total	7.1%	21.4%	3.6%	32.1%
Total		Count	18	27	11	56
		% of Total	32.1%	48.2%	19.6%	100.0%

Hypothesis 5:

H0: The choice of inventory method is independent of the importance of Inventory Valuation.

H1: The choice of inventory method adopted depends on the importance of Inventory Valuation.

The aim of this hypothesis is to evaluate if there is a relationship/ correlation between the importance of Inventory valuation method and the choice of the method adopted. Particularly, we want to find out if the choice of Inventory method depends on its importance.

Table 15. H5 - Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.379a	4	.666
Likelihood Ratio	3.489	4	.480
Linear-by-Linear Association	.415	1	.519
N of Valid Cases	56		

a. 6 cells (66.7%) have expected count less than 5. The minimum expected count is .20.

The p - value is 0.666 and is greater than the significance level of 0.05; hence, the null hypothesis is not rejected, and we conclude that the choice of inventory method adopted does not depend on the importance placed on inventory valuation.

Hypothesis 6:

The aim of this hypothesis is to check if there is a relationship between the individual knowledge of Inventory valuation method and the choice of the method adopted. Here, we consider the understanding of the three methods.

a)

H0: The understanding of FIFO is not related to the choice of an inventory valuation method used.

H1: The understanding FIFO is related to the choice of an inventory valuation method used.

Table 16. H6(a) – Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.719a	4	.000
Likelihood Ratio	27.550	4	.000
Linear-by-Linear Association	21.142	1	.000
N of Valid Cases	56		

a. 4 cells (44.4%) have expected count less than 5. The minimum expected count is .39.

The p – value here is 0, therefore, the null hypothesis is rejected since the p – value is less than 0.05. We then conclude that, the understanding of FIFO is related to the choice of Inventory method adopted.

b)

H0: The understanding of Weighted Average is not related to the choice of an inventory valuation method used.

H1: The understanding Weighted Average is related to the choice of an inventory valuation method used.

Table 17. H6(b) - Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.447a	4	.000
Likelihood Ratio	23.737	4	.000
Linear-by-Linear Association	12.794	1	.000
N of Valid Cases	56		

a. 5 cells (55.6%) have expected count less than 5. The minimum expected count is .79.

The p-value here is 0, therefore, the null hypothesis is rejected since the p-value is less than 0.05. We then conclude that the Understanding of Weighted Average is related to the choice of Inventory method adopted.

c)

H0: The understanding of Specific Identification is not related to the choice of an inventory valuation method used.

H1: The understanding Specific Identification is related to the choice of an inventory valuation method used.

Table 18. H6(c) - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.242a	4	.993
Likelihood Ratio	.242	4	.993
Linear-by-Linear Association	.200	1	.655
N of Valid Cases	56		

4 cells (44.4%) have expected count less than 5. The minimum expected count is .79.

The p - value here is 0.993, therefore, the null hypothesis is not rejected since the p - value is greater than 0.05. We then conclude that the Understanding of Specific Identification is not related to the choice of Inventory method adopted.

Hypothesis 7:

H0: The choice of Inventory Method does not depend on the Inventory System

H1: The choice of Inventory Method depends on the Inventory System.

For testing this hypothesis, the choice of inventory system and the choice of inventory valuation method were put into correlation. These are two nominal variables: inventory system and inventory valuation method therefore, we are using the Pearson's chi-square test.

The results of this test show that companies that utilize the periodical inventory system equally prefer each of the three methods. Companies using the perpetual inventory system prefer the weighted average method of inventory valuation. The least preferred method for companies that use the perpetual inventory system is the specific identification inventory valuation method.

Table 19. H7 – Inventory system and Inventory Method Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identification	
Inventory system	Periodical	Count	8	9	8	25
		% within Inventory system	32.0%	36.0%	32.0%	100,0%
		% within Inventory Method	44.4%	33.3%	72.7%	44,6%
		% of Total	14.3%	16.1%	14.3%	44,6%
	Perpetual	Count	10	18	3	31
		% within Inventory system	32.3%	58.1%	9.7%	100,0%
		% within Inventory Method	55.6%	66.7%	27.3%	55,4%
		% of Total	17.9%	32.1%	5.4%	55,4%
Total		Count	18	27	11	56
		% within Inventory system	32,1%	48.2%	19.6%	100.0%
		% within Inventory Method	100,0%	100.0%	100.0%	100.0%
		% of Total	32,1%	48.2%	19.6%	100.0%

Table 20. H7 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.908a	2	.086
Likelihood Ratio	4.995	2	.082
Linear-by-Linear Association	1.380	1	.240
N of Valid Cases	56		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.91.

For the hypothesis to be accepted. The p – value should be lower than 0.05. This means that there is little or no evidence against the hypothesis. From the Pearson Chi-Square we can see that p – value is 0.086. This value of p tells us that the choice of Inventory Method does not depend on the Inventory System. In other words, there is no association between Inventory Method and Inventory System.

Hypothesis 8:

H0: The choice of Inventory Valuation Method does not depend on its simplicity of use

H1: The choice of Inventory Method depends on its simplicity of use.

For testing this hypothesis, the choice of inventory system and the simplicity of the inventory valuation method were put into correlation. These are two nominal variables: easy and simple to use and inventory valuation method therefore, we are using the Pearson's chi-square test.

Table 21. H8 – Inventory Method * Easy simple Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identifi-cation	
Easy_ simple	no	Count	7	16	10	33
		% within Easy simple	21.2%	48.5%	30.3%	100,0%
		% within Inventory Method	38.9%	59.3%	90.9%	58,9%
		% of Total	12.5%	28.6%	17.9%	58,9%
	yes	Count	11	11	1	23
		% within Easy simple	47.8%	47.8%	4.3%	100,0%
		% within Inventory Method	61.1%	40.7%	9.1%	41,1%
		% of Total	19.6%	19.6%	1.8%	41,1%
Total		Count	18	27	11	56
		% within Easy simple	32,1%	48.2%	19.6%	100.0%
		% within Inventory Method	100,0%	100.0%	100.0%	100.0%
		% of Total	32,1%	48.2%	19.6%	100.0%

The results of this test show that in general simplicity of the method does not affect the choice of the inventory method. However, from the companies that use FIFO method 60% answered that this is because of the simplicity of the method.

Table 22. H8 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.636a	2	.022
Likelihood Ratio	8.580	2	.014
Linear-by-Linear Association	7.325	1	.007
N of Valid Cases	56		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.52.

For the hypothesis to be accepted, the p – value should be less than 0.05. This means that there is little or no evidence against the hypothesis. From the Pearson Chi-Square we can see that p – value is 0.022. This value of p tells us that there is a statistically significant association between the simplicity of the method and the choice of inventory valuation method, therefore the H0 is rejected.

Hypothesis 9:

H0: The choice of Inventory Method is correlated with the choice made by industry peers.

H1: The choice of Inventory Method is not correlated with the choice made by industry peers.

For testing of this hypothesis, industry peer's choice and the choice of inventory valuation method were put into correlation. These are two nominal variables: Used by other similar companies and inventory valuation method therefore, we are using the Pearson's chi-square test.

Table 23. H9 – Inventory Method * Used by other Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identification	
Used_ by_ other	no	Count	15	25	11	51
		% within Used by other	29.4%	49.0%	21.6%	100,0%
		% within Inventory Method	83.3%	92.6%	100.0%	91,1%
		% of Total	26.8%	44.6%	19.6%	91,1%
	yes	Count	3	2	0	5
		% within Used by other	60.0%	40.0%	0.0%	100,0%
		% within Inventory Method	16.7%	7.4%	0.0%	8,9%
		% of Total	5.4%	3.6%	0.0%	8,9%
Total		Count	18	27	11	56
		% within Used by other	32,1%	48.2%	19.6%	100.0%
		% within Inventory Method	100,0%	100.0%	100.0%	100.0%
		% of Total	32,1%	48.2%	19.6%	100.0%

The results of this test clearly show that the choice of the inventory method is not at all affected by the choice of inventory methods by other companies with similar business nature. Only 9% of the respondents gave an answer that their choice is triggered by industry peer's choice.

Table 24. H9 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.481a	2	.289
Likelihood Ratio	3.220	2	.200
Linear-by-Linear Association	2.422	1	.120
N of Valid Cases	56		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is. 98.

Given that the p – value is 0.289, there is no statistically significant association between choice of industry peers and the choice of inventory valuation method. Therefore, the null hypothesis is accepted.

Hypothesis 10:

H0: The choice of Inventory Valuation Method does not depend on the perceived inventory evaluation accuracy.

H1: The choice of Inventory Valuation Method depends on the perceived inventory evaluation accuracy.

Table 25. H10 – Inventory Method * Most accurate Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identify-cation	
Most_ accurate	no	Count	9	10	1	20
		% within Most accurate	45.0%	50.0%	5.0%	100,0%
		% within Inventory Method	50.0%	37.0%	9.1%	35,7%
		% of Total	16.1%	17.9%	1.8%	35,7%
	yes	Count	9	17	10	36
		% within Most accurate	25.0%	47.2%	27.8%	100,0%
		% within Inventory Method	50.0%	63.0%	90.9%	64,3%
		% of Total	16.1%	30.4%	17.9%	64,3%

		Inventory Method			Total
		FIFO	Weighted average	Specific identify-cation	
Total	Count	18	27	11	56
	% within Most accurate	32,1%	48.2%	19.6%	100.0%
	% within Inventory Method	100,0%	100.0%	100.0%	100.0%
	% of Total	32,1%	48.2%	19.6%	100.0%

For testing of the first hypothesis, inventory valuation accuracy and the choice of inventory valuation method were put into correlation. These are two nominal variables: most accurate inventory method and inventory valuation method therefore, we are using the Pearson's chi-square test.

Table 26. H10 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.017a	2	.081
Likelihood Ratio	5.747	2	.056
Linear-by-Linear Association	4.601	1	.032
N of Valid Cases	56		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.93.

For the hypotheses to be accepted. The p – value should be less than 0.05. This means that there is little or no evidence against the hypothesis. From the Pearson Chi-Square we can see that p – value is 0.081. This value of p tells us that there is no statistically significant association between the perceived inventory evaluation accuracy and the choice of inventory valuation method. Hence, the null hypothesis is accepted.

Hypothesis 11:

H0: The choice of Inventory Valuation Method does not depend on whether the inventories are obsolescent or not.

H1: The choice of Inventory Valuation Method depends whether the inventories are obsolescent or not.

For testing this hypothesis, inventory obsolescence and the choice of inventory valuation method were put into correlation. These are two nominal variables and again we are using the Pearson's chi-square test.

Table 27. H11 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.073a	2	.964
Likelihood Ratio	.072	2	.965
Linear-by-Linear Association	.004	1	.949
N of Valid Cases	56		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 1.77.

From the Pearson Chi-Square we can see that p – value is 0.964. This value of p tells us that there is no statistically significant association between whether inventories are obsolete and the choice of inventory valuation method; therefore, we do not reject the null hypothesis.

Table 28. H11 – Inventory obsolescence and Inventory Method Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identify-cation	
Obsolescence	no	Count	15	23	9	47
		% within Obsolescence	31.9%	48.9%	19.1%	100,0%
		% within Inventory Method	83.3%	85.2%	81.8%	83,9%
		% of Total	26.8%	41.1%	16.1%	83,9%
	yes	Count	3	4	2	9
		% within Obsolescence	33.3%	44.4%	22.2%	100,0%
		% within Inventory Method	16.7%	14.8%	18.2%	16,1%
		% of Total	5.4%	7.1%	3.6%	16,1%
Total		Count	18	27	11	56
		% within Obsolescence	32,1%	48.2%	19.6%	100.0%
		% within Inventory Method	100,0%	100.0%	100.0%	100.0%
		% of Total	32,1%	48.2%	19.6%	100.0%

Another interesting thing to find out is if companies with obsolete inventories use FIFO. From the results we can see that only 33% of the companies who consider their inventories to be obsolescent use FIFO. The preference of the three methods is almost equally distributed.

Hypothesis 12:

H0: The choice of Inventory Valuation Method does not depend on whether costs are stable or not.

H1: The choice of Inventory Valuation Method depends on whether the costs are stable or not.

Table 29. H12 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.042a	2	.594
Likelihood Ratio	1.028	2	.598
Linear-by-Linear Association	.507	1	.476
N of Valid Cases	56		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.52.

Again we have two nominal variables cost of acquisition of inventories and inventory valuation method. Therefore, we are using Pearson's chi-square test.

From the Pearson Chi-Square we can see that p – value is 0.594. This value of p tells us that there is no statistically significant association between inventories cost of acquisition and the choice of inventory valuation method, therefore the alternative hypothesis is rejected.

Table 30. H12 – Inventory with unstable cost and Inventory Method Cross-tabulation

			Inventory Method			
			FIFO	Weighted average	Specific identification	Total
Unstable cost	No	Count	11	17	5	33
		% within Unstable cost	33.3%	51.5%	15.2%	100,0%
		% within Inventory Method	61.1%	63.0%	45.5%	58,9%
		% of Total	19.6%	30.4%	8.9%	58,9%
	Yes	Count	7	10	6	23
		% within Unstable cost	30.4%	43.5%	26.1%	100,0%
		% within Inventory Method	38.9%	37.0%	54.5%	41,1%
		% of Total	12.5%	17.9%	10.7%	41,1%
Total		Count	18	27	11	56
		% within Unstable cost	32,1%	48.2%	19.6%	100.0%
		% within Inventory Method	100,0%	100.0%	100.0%	100.0%
		% of Total	32,1%	48.2%	19.6%	100.0%

We are also interested in knowing if companies with unstable costs prefer to use Weighted Average Method. The results of this test show that less than half of the companies in question consider the cost of acquisition of their inventories to be unstable. Companies that have an unstable cost of acquisition prefer the weighted average method.

Hypothesis 13:

H0: The choice of Inventory Valuation Method does not depend on Inventory Variability

H1: The choice of Inventory Valuation Method depends on Inventory Variability

For testing this hypothesis, variability of inventory and the choice of inventory valuation method were put into correlation. These are two nominal variables: variability of inventory and inventory valuation method therefore, we are using the Pearson's chi-square test.

Table 31. H13 – Chi Square test

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.678a	2	.712
Likelihood Ratio	.677	2	.713
Linear-by-Linear Association	.638	1	.424
N of Valid Cases	56		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.91.

From the Pearson Chi-Square we can see that p – value is 0.712. This value of p tells us that there is no statistically significant association between variability of inventory and the choice of inventory valuation method. In order words, the choice of Inventory Valuation Method does not depend on Inventory Variability.

The results of this test show that more than half of the companies in question consider their inventories to be variable. Companies that have variable inventories mostly prefer the weighted average method.

Table 32. H13 – Inventory variability and Inventory Method Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identify-cation	
Variability	no	Count	7	12	6	25
		% within Variability	28.0%	48.0%	24.0%	100,0%
		% within Inventory Method	38.9%	44.4%	54.5%	44,6%
		% of Total	12.5%	21.4%	10.7%	44,6%
	yes	Count	11	15	5	31
		% within Variability	35.5%	48.4%	16.1%	100,0%
		% within Inventory Method	61.1%	55.6%	45.5%	55,4%
		% of Total	19.6%	26.8%	8.9%	55,4%
Total		Count	18	27	11	56
		% within Variability	32,1%	48.2%	19.6%	100.0%
		% within Inventory Method	100,0%	100.0%	100.0%	100.0%
		% of Total	32,1%	48.2%	19.6%	100.0%

Hypothesis 14:

H0: The choice of Inventory Valuation Method does not depend on whether Inventory is perishable or not.

H1: The choice of Inventory Valuation Method depends depend on whether Inventory is perishable or not.

For testing this hypothesis, perishability of inventory and the choice of inventory valuation method were put into correlation. These are two nominal variables: Perishability of inventory and inventory valuation method therefore, we are using the Pearson's chi-square test.

For the hypothesis to be accepted. The p – value should be lower than 0.05. This means that there is little or no evidence against the hypothesis. From the Pearson Chi-Square we can see that p – value is 0.018. This value of p tells us that there is a statistically significant association between perishability of inventory and the choice of inventory valuation method, therefore the alternative hypothesis is accepted.

Table 33. H14 – Chi Square test

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.014a	2	.018
Likelihood Ratio	7.535	2	.023
Linear-by-Linear Association	5.371	1	.020
N of Valid Cases	56		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 1.96.

The results of this test show that most of the companies do not have perishable inventories. Companies that have perishable inventories prefer the FIFO method of inventory valuation.

Table 34. H14 – Inventory perishability and Inventory Method Cross-tabulation

			Inventory Method			Total
			FIFO	Weighted average	Specific identification	
Perishability	no	Count	11	25	10	46
		% within Perishability	23.9%	54.3%	21.7%	100,0%
		% within Inventory Method	61.1%	92.6%	90.9%	82,1%
		% of Total	19.6%	44.6%	17.9%	82,1%
	yes	Count	7	2	1	10
		% within Perishability	70.0%	20.0%	10.0%	100,0%
		% within Inventory Method	38.9%	7.4%	9.1%	17,9%
		% of Total	12.5%	3.6%	1.8%	17,9%
Total		Count	18	27	11	56
		% within Perishability	32,1%	48.2%	19.6%	100.0%
		% within Inventory Method	100,0%	100.0%	100.0%	100.0%
		% of Total	32,1%	48.2%	19.6%	100.0%

Concluding remarks

This section brings together the findings from international literature and previous studies on the subject and the previously presented findings of our study presented. An overview of the most significant factors that affect the choice of inventory valuation method will be provided here.

Level of education

Many previous studies have shown the level of education of the managers has big impact on the company in general. Companies led by managers with completed higher levels of education are more successful than companies led by managers with lower education. Also as previously mentioned, insufficient education of the responsible person can lead to the company not choosing to use the most suitable inventory valuation method. (Ibarra, 2008) One more thing to be taken in consideration is that employees with lower education will have less knowledge of the existing inventory valuation methods. This leads to the expectation that higher educated managers will choose to use more sophisticated methods. Our study confirms that the managers level of education affects the choice of inventory valuation method. But unlike the prediction that was previously made managers with master's degree do not prefer the specific identification method, which is considered to be the most sophisticated method, but prefer to use the FIFO method which is considered to be simpler. Managers with a high school diploma are equally choosing between FIFO and Specific identification method. Managers with a bachelor's degree prefer the weighted average method.

Understanding of the method

Valuation of inventories is a major problem in the accounting practice. The understanding of the inventory valuation methods is shown to be quite important in previous studies as well as in our study. Gu (2013) says it is key to choose a method that corresponds to the characteristics of the inventories and the method to be most corresponding with the business in general. The chosen method will influence the company's asset, profit, cash flow, financial ratios and tax issues. Also, it will influence the valuation of the operating performance among enterprises. Different valuation methods will result in different final inventory values, thus indirectly influence the enterprise operating performance. Therefore, the one responsible for choosing the inventory method has to have sufficient knowledge and to understand all the methods to be able to choose the most suitable method for the company. The results from

our study show that inventory valuation is in general important. Most of the respondents answered that they understand the inventory valuation as well as FIFO and the weighted average method. After testing the hypotheses, the results show that understanding FIFO and the weighted average method affects the choice of the utilized method. This cannot be said for the specific identification method. This may be because this method is considered to be the most complicated and most time consuming to use.

Simplicity of use

As previously mentioned in a study by Wood and Sangster 2008 companies choose the particular inventory method because it is the easiest method. This is confirmed in another study by Mosa *et al*. (2013) where the main finding is that FIFO method for inventory valuation is used because it is easy to implement and exercise on all types of inventory and opposite of this weighted average was not used because there was a lack of knowledge of its implementation. The same can be said for the specific identification method. Unlike the predictions made the results of this study show that in general simplicity of the method does not affect the choice of the inventory method. It is important to be mentioned, from the companies that use FIFO method 60% answered that this is because of the simplicity of the method as well as that from the companies that use the weighted average method 40% answered that this is due to the simplicity to understand and use the method. Unlike the previous two methods, only 10% of specific identification users listed simplicity as the reason for using this method.

Limitations of the study

There are a few limitations for the study:

- The sample size is small and studies with small sample size result with higher sampling error. The survey was initially sent to 174 companies, but only 56 companies returned the survey. Therefore, it is suggested for further studies conduction of research on even larger sample.

- There is a possibility that the survey was not answered by the right person. The survey was conducted online and therefore we have no knowledge if it was answered by the manager or someone from a lower position with less knowledge about inventories.
- The results of the study may have been more accurate if the chosen method was a personal interview with the responsible person from the companies instead of online survey. When answering online questionnaires, respondents are less concentrated and want to finish faster.

Future studies in this area should include larger sample size and then the results can be accepted with higher probability for validity. Using the interview as a research method instead of distributing online questionnaire will bring more accurate results, as well as addressing the most qualified person to speak on the subject.

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