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Opportunities for Improving the Inventory Management Based on the Example of Albanian Manufacturing Companies

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Summary. In the way of fast and complex developments of businesses, the inventory plays as well an important role. The complexity of the economic environment where the businesses operate and the problems they encounter orient the manager's attention towards the management of inventory. This refers to the inventory's specifics in general and his constituent elements. Despite these the common characteristic of the inventory is its double character, as on one hand it represents necessary, inevitable elements for the development of the productive activity of every business, and on the other the inventory requires considerable commitments of the financial sources. This has made the efficient management of the inventory a central problem, on which a series of researches have been concentrated.

This paper is an effort to deal with some problems of efficient management of the inventory in the business organizations, regarding the quantity, quality, and time dimensions on the inventory because inventories are the focal point in business performance. But, the greatest part of businesses in Albania operate in the conditions when information about inventory management missing. Problems addressed in this paper can be serve the managers for improvement their job in the future.
Key words: business organisation, inventory, inventory management, EOQ model.

Introduction

Inventories are necessary and present in every business, despite the economy branch they operate in, whether being producing business, trade business, whatever kind of service character of business organization such as educative, juristic, cultural, or health. Choi (2012) indicates that effective inventory management is essential in the operation of any business. The problems that the inventory focuses on, make it an important economic element, at that degree that it can be said that it has occupied the business world. The importance of the inventory is highlighted if there are considered the motives that condition it. From an economic point of view the inventories make it possible the product realization and allow the scale economy. They are in continuous motion from one stage to another

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of the production processes where the business is engaged in. Also, inventory represent elements which are very sensible to the market state. In this context they smooth different nature variation, providing a normal producing process and prevent the insecurity mainly to the clients, suppliers and transport.

This has consolidated, from the academic point of view but also from the managerial one, the thought that the inventory is necessary in the stores for as long as it is necessary for the refine process or processes on which the business functions. In the case when the necessary time limit is not respected it is delayed the moment when the monetary incomes which generate profit, would cover the financial output caused by the costs of buy in the inventory. This situation is present for every element of the inventory as well as for the integrity of the inventory, on which the business operates.

The inventory management in Albania is critically affected and limited by the abilities of the managers. These abilities enable success of businesses which are on the way of transformation towards an oriented market economy. In these conditions, theoretical problems of inventory management are expected to contribute in the managers' qualification for the managerial capacity strengthening in this direction. Currently in Albania, the inventory management is one of the economic problems treated not in the appropriate dimensions by the country economic literature, but even in the practical activity aspect there are evident deficiencies. This paper serves to this purpose. In this context, the main objective of this paper is the identification and the analysis of the problems linked with the inventory management and the use EOQ model for its optimal management in the current conditions of the business.

The realization of this objective is made possible if we find a solution even for the problems that constitute this paper specific objective such as:

- Theoretical treatment of the inventory management.
- Identification and testing of the knowledge of the Albanian managers regarding the inventory management.
- Identification and argumentation of using the functional models regarding the definition of the quantity of order and its cost.

Literature review

Management inventory present a critical managerial commitment. Basin (1990) admit that: effective inventory is of paramount importance in the running of a business. While, Muchaendepi et al (2019) stress that: "...SME's have to face the competition to survive the market. Due to this competition, only the firm with the best logistics management would be able to out-compete other companies. Inventory being the most important aspect of logistics ....". Krajewski, Ritzman, Malhotra (2019) estimated inventory management in some aspects. They highlighted "Inventories are important to all types organizations, their employees and their supply chains". "Inventory usually occurs in the form of finished goods or goods to be used to fulfil a particular purpose" (Levin, et. al., 1972). While, Korponai, Tóth and Illés (2017) admit: "The optimisation of the inventory level and the inventory

management expenses together means an important factor in the competitiveness of the company". For Bowersox (2002), the inventory management needs to be organized in a logical way so that the organization can be able to know when to order and how much to order. Inventory management is a method that companies use to organize, store, and replace inventory, to keep an adequate supply of goods at the same time minimizing cost, Deveshwar and Dhawal (2013). Atnafu and Balda (2018) evaluate a lot the inventory management importance and admit: "Inventory management is very vital to an enterprise since it is custom-made to reducing costs or proliferating profits while satisfying customer's demands by guaranteeing that balanced items of stock are sustained at the right quality, quantity, and that are obtainable at the right time and in the right place".

They enable normal operation of the business organizations. The inventory is studied and defined by different researchers such as Grando (1995), Masini (1984), Schmenner (1984), etc. All the studied definitions despite their highlighted differences testimony the fact that the inventory represents the integrity of materials, which, through process of refining they finalise different products or services and as well ready made products. The kinds, size, providing sources (internal and external ones) functional destination (half ready raw, ready product) and the motive (functional, safe or speculative) can be different, which enables the classification and definition of the inventory structure in every business.

The inventory management is an important managerial concern. Naliaka and Namusonge (2015) identified that inventory management affects competitive advantage of manufacturing firms. For Stevenson (2010): "Inventory management is defined as a framework employed in firms in controlling its interest in inventory". "Inventory control is an important activity that needs special attention from retail companies. It determines the optimal inventory amount with minimum total cost" (Hertini et al, 2018). This, not only because the inventories are ubiquitous but also for their varieties. "Inventory Management is an important concern for managers in all types of businesses" (Krajewski, Ritzman, 2005).

The inventory management constitutes an activity which based on acceptable time use, over assets like the raw, half-ready products or ready products which harmonize the objectives and the market demands. Aspects related to this concept like the economic buying size, the time of buying, etc have to do with managerial decision-making for making the proper steps in order to create a stable trade and regulatory activity for the efficient and harmonized operation of the business. Keeping inventories is accompanied by a series of problems of the business in general, which is justified by the fact that they support the refining process. Based on Kamau and Kagiri (2015) it has also been proven that the discrepancy of inventory will give impact to the competitiveness, and also the profitability of the organization. In this context, it can used inventory control model or technique. Mustafid et al (2018) stated: "The ICS is defined as a tool for management and control of supply, storage, distribution and recording of products to maintain adequate stock quantities in accordance with consumer demands or needs". While, Aro-Gordon and Gupte (2016) have defined inventory management as "a blueprint of the inventory management system and includes the physical infrastructure, the planning and control

structure, the management information architecture as well as the organisational embedding of the inventory system". However, if we consider the costs that the business is encountered regarding the inventories, it can be concluded that they are presented as the best alternative when the other ones cost more. This highlights the necessity of efficient management of inventories. The inventory management is constituted by a series of problems that are present in every business and it has to do with finding alternatives that will facilitate the solution of the problem of inventory in practice. Esther (2012) admit that the poor practices of inventory management will cause not enough raw materials for production line and distribution cycle productivity is disrupted. Ngubane et al (2015) also stated that it was found that lack of inventory management skills have prohibited the manufacturing SMEs to be powerful competitors in the manufacturing industries. While, Chan et al (2017) stress: "The common causes that lead to inaccuracy of company inventory records are the shrinkage of inventory, errors in inventory transaction and keeping the inventory in the wrong place".

Inventories have contradictory nature as the lack of inventory elements as well as their excessive presence is accompanied with cost. This make inventories a central problem in business which requires qualified solution and is related to a professional concern of the manager. The professional commitment of the manager's activity regarding the inventory management should as well consider the fact that the demand for products and services is in some cases a random variable. Therefore, the manager should be careful regarding the quantity of the inventory as two situations might be present:

- The risk of ordering less than the demand. In this case, we have a confrontation with the cost of running out of reserves.
- The risk of ordering more that the demand, therefore we have the confrontation with the cost of unnecessary ordering and excessive keeping cost.

All these make the inventory one of the interesting problems that impact business performance because exist a strong relationship between inventory and production. Waters (2003) indicated the common scenario is inventory records differ with the actual quantity on hand and this leads to insufficient raw materials for production line.

This interest has also to do with the fact that the inventory:

- Is one of the most important elements of the circulating capital which supports the activity of every business.
- Concerns a considerable part of the financial means of every business. The experience of different businesses highlights the fact that 15-40% of the tools are engaged with the reserves which can be compared to the value of some months sales. So they reflect hardened monetary tools, which make inventory keeping accompanied with cost.

Regarding the above, the inventory management focuses on the researches on the fact that this management requires sufficient technical, technological, and economic acknowledgement. All these enable the manager to choose the best available alternative, which differs, from the kind of inventory element and the time defined for it. This makes that different selection models be used for different elements of inventory.

One of the most useful models of the order is the model with fix quantity and which is known with the name "the system of the permanent control" or the system "Q", which is part of it is consumed during the refining process. This model has advantages because the reserve level of the inputs is controlled through registration of the actions in and out entries. It has two parameters: 1) The quantity of the order; 2) The time of the order.

Determining the quantity of the order is a preoccupying problem for the business because it relates to the stock. The confrontation of business managers with the stock inventory in both cases (excess of the stock or with its lack) presents managerial difficulties. In the absence of stock Vörös (1991) suggests that an initial condition, we define that the unsatisfied demand due to stock shortage can be rescheduled by a defined cost level, and it will be fully performed at a later date.

The quantity of the order is conditioned by the level of the reserve in the store. Whereas, time "t" represents the point of reordering and is a sensible element as it protects the economic activity of the business and manager by the supply unexpected phenomena. The inventory management is a studied problem therefore there is a wide literature related to it. "The inventory management technique is more useful in determine the optimum level of inventory and finding answers to problem of safety stock and lead time" (Sohail, Sheikh, 2018). While, Asana et al (2020) admit: "The inventory management is one strategy that needs to be considered by the company". Because "Poor inventory management leads to a company not satisfying their consumers not reaching their targets and objectives, and the quality of production" (Mankazana, Silase, Molefe, 2018). This has made it possible the processing of many models for the definition of the inventory quantity and time of order etc. The problem is their implementation in managerial practice of the companies, which would increase the efficiency of their management. From this point of view, the manager is given the task of defining the model according to the kind of inventory, specifics for of their demand, casual circumstances etc. Chan et al (2016) suggest that manufacturing SMEs have to improve their manufacturing operations including inventory. Other scholars view the inventory management as an important precondition for performance improvement. In this context, Omar et al (2016) stress that .... boost their performance in order to face the increasing competition in the marketplace. Tayur et al (2012), expresses that many management issues could be solved by removing abundance inventory.

The inventory management in Albania is critically affected and limited by the abilities of the managers. These abilities enable success of businesses which are on the way of transformation towards an oriented market economy. In these conditions, theoretical problems of inventory management are expected to contribute in the managers' qualification for the managerial capacity strengthening in this direction. Currently in Albania, the inventory management is one of the economic problems treated not in the appropriate dimensions by the country economic literature, but even in the practical activity aspect there are evident deficiencies. This paper serves to this purpose. In this context, *the main objective of this paper is the identification and the analysis of the problems linked with the inventory management and the use EOQ model for its optimal management in the current conditions of the business*.

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Methodology

Methodology is conditioned by the nature of the studying problem. It is composed by two parts:

- *Desk work*, has to do with finding and studying the necessary literature. The treatment of the problem in the theoretical scope, the analysis of previous treatments, and factual calculations in the function of the selected models and come up to the conclusions.
- *Terrain work* will be realized through surveys in terrain. The intended population are the businessmen or the managers who possess the needed information to answer to the objectives of this paper. They were considered about SME managers.

The localisation criterion from the geographical point of view is selected Tirana and this for two reasons:

- It has the greatest number of population in all the country and as a result the demand for products and services in higher.
- Being the capital of and the greatest industrial and trade centre, which entered the first in the market economy, it was easy to find the necessary information for the study objectives.

The selection was done based on the method of simple casual. There were not considered for the study very small businesses with small and weak economic activity.

The data were gathered through the interviews with different managers or businessmen who operate in this area. For data collection the semi-structured interview is used, because provides relies on asking within predetermined thematic framework. In order to gather the necessary information, the interview lasted about 35 days.

Through the semi-structured interviews aim the testing of businessman and managers knowledge related to inventory management and the methods that they use. Generally, furniture business managers, despite the business size make an routine job related to inventory management. To concretize the method of inventory management EOQ from sampling, it was selected a business. Empirical data of this business was used for practice demonstration of method EOQ.

Besides the completion of the paper objectives, the interviews had as well the aim to generalize the effective management of the inventories for the other businessmen, not only to provide conviction to them but also to help them, opening thus a way to their successful activity. Firstly, interviewed 47 business owners and business managers.

So, the inventory management was analyzed of a carpentry because the carpentry industry involves many different elements inventory. For Harling (2012) "A case study is a holistic inquiry that investigates a contemporary phenomenon within its natural setting. Specifying particular terms in greater detail". While, Yin (2009) accepted that generally the case study is 'investigate contemporary phenomena within its real-life context". But, Crowe et al (2011) think that: "A case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context". This business is named as business AB in order that the identity of this business is protected. The business on the focus is facing with different problems such as overstock.

Two problems were considered in this paper:

1. The problem of the stable demand refers to the producing businessman. For this was used the EOQ model (Economic Order Quantity), by means of which it will define the necessary quantity to be ordered and the time between orders should be done.
2. The inventory management problem from the point of view of business policies. For this it was considered the TBO (Time Between Order).

Understanding and controlling lead time is paramount in inventory management. This can cause further delays with subsequent orders leading to ever-growing lead times, cost and unhappy customers.

The engagement in this study derives from the fact that based on the research in written or online sources there is no real scientific study on inventory management according to EOQ in SMEs operating in the field of carpentry in our country.

Research question: Is inventory management a condition for business performance?

Results

Inventory good management conditioned by also the techniques use for this purpose. Techniques selection constitutes decision-making problem by the manager and this is dependences of managerial professionalism.

Initially there were interviewed 47 businesspersons and it was noticed that 39 or 83% of them were not completely familiar with the problems of the efficient inventory management, such as the quantity of the order, the cost of the order, etc. They very few evaluate the problems of inventory management as a factor, which affects their decision-making in the function of the business objectives. 12% of respondents have knowledge until medium level for science problems of inventory management. While, the rest that represents 2 of the respondents or 5% have good knowledge for inventory management.

Situation condition by also education level of interviewed. A majority part of responders by 40% are with high school level and around 22% are with elementary school. While, 34% of the interviewed have finished bachelor program and 4% have finished professional master program. In the actual period, knowledge for inventory scientific management are few.

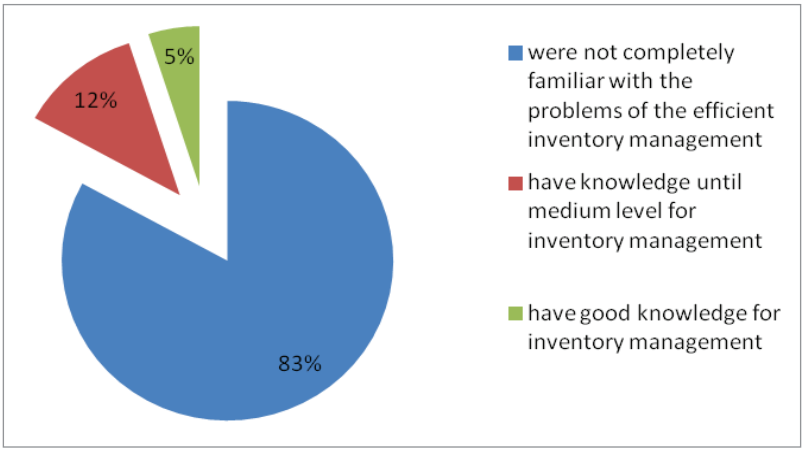

Figure 1. Managers knowledge level on inventory management

As their basis on the inventory management, served their intuition only as well as their experience. However, the power of the intuition during this process does not provide efficient decisions. The concept of intuition leads to a non rational solution of the problem on which the problem focuses. Thus the intuitive method of managing should be replaced with the management according the scientific judgement, because not intuition but logic has the best impact on management. Logic develops and strengthened from study and use the analytical methods in decision making. One of the usable techniques for inventory management is EOQ.

"However, determining optimal ordering quantity is one of the main aspects in inventory management that can facilitate the inventory management to run with optimal cost" (Senthilnathan, 2019). For Hax and Candea (1984): "EOQ as a model has been introduced in 1913 by Ford W. Harris. R. H. Wilson and K. Andler are given credit for their in-depth analysis and application of the EOQ model".

This phenomenon cannot and should not be due only to the fact that it is ubiquitous but also to the fact that it attracts financial means of the business.

"EOQ model has had on a century of researchers and practitioners in the fields of operations management and operations research" (Tungalag, Erdenebat, Enkhbat, 2017). Other scholars support this idea. Hertini et al (2018) admit: "The EOQ model is used to determine the optimal order quantity of a product". This optimum order quantity leads to minimal inventory costs so as to provide maximum benefits. For this, it is considered the formula known as EOQ. For some scholars EOQ (Economic Order Quantity) model is an old model (Riza, Purba, Mukhlisin, 2018). Other scholars accept that it is old method but it can use for inventory management problems. Abigail, Hanni (2021) admit: "The EOQ model is one of the oldest, and most general inventory control techniques to be used". While, Kumar (2016) think that EOQ technique can be used to arrange the procurement and storage of supplies.

Krajewski, Ritzman, Malhotra (2019) stress: "Use the EOQ:

- If you follow a ´make – to – stock` strategy and the item has relatively stable demand.
- If you caring costs per unit and set up or ordering costs are known and relatively stable".

Based to Hoswari, Gozali, Marie and Sukania (2019) admit that inventory costs include ordering costs, holding costs, and shortage cost. While Abigail, Hanni (2021) express "..... this model does not use shortage costs". Kumar (2016): ordering costs include the cost of ordering the products, cost to communicate about the order, travel cost, daily allowance for the employee, transport cost, and the others. There are other scholars that have the same idea. So, Kisaka (2006) found that there was cost saving which could have been observed through employing the EOQ model. The EOQ is a measure used to find the optimal quantity that needs to be ordered at a given point in time, given the cost of placing the order and the storage cost, as well as the amount required (Parasuraman, 2014).

Based on Tungalag et al (2017): "The Economic Order Quantity (EOQ) is the number of units that a company should add to inventory with each order to minimize the total costs of inventory—such as holding costs, and shortage costs".

Through EOQ method, manager orients its activity refers minimal costs for inventory.

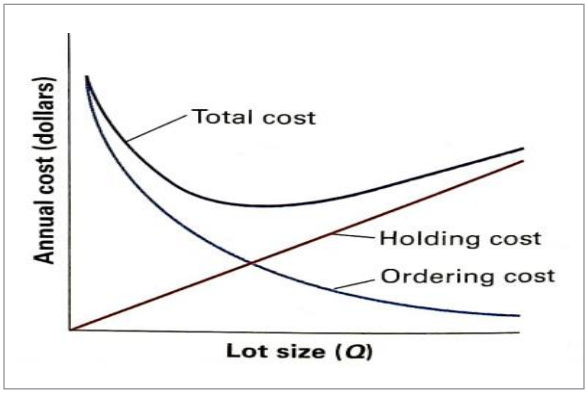

Figure 2. Relation between EOQ and total cost
Source: Krajewski, Ritzman, 2005.

According to the owner of the carpentry, the economic quantity of purchasing is conditioned by the quantity needed to be ordered repeatedly and by the cost reduction of the inventory management. The purchasing cost is conditioned by the respective quantity. It tends to lower when the quantity purchased is increased as depending on this, the suppliers reduce the price. It is very important for the buyers (the carpentry business in our case). In this carpentry was selected one of the element of the inventory which has stable demand of it, with no casual impacts, conditioned by the future tendencies. It is selected the kind of inventory "melamine raw" which is very voluminous inventory. The definition of the

quantity of the inventory is conditioned by the forecast of the quantity of production, the time, storing capacities and logistic availability. Determining the ordering times and order amounts of goods in inventory are the strategic decisions to either mitigate total costs or increase total profits (Mousavi et al, 2016).

The carpentry business produce the chairs by melamine material (350 chairs/month).

The dimensions for one chair are:

- 50cm × 45cm (for seat) + 40cm × 45cm(for back support) = 0.4m^2 melamine;
- 350 chairs × 0.4m^2 × 12months/year = 1680 m^2 melamine **(D)**.

The dimensions of a melamine sheet 3.66 m × 1.83 m = 6.7m^2/sheet:

- Utilization coefficient of a melamine sheet = 85%;
- Utilization surface per a melamine sheet = 85% × 6.7m^2 = 5.7m$^{2;}$
- Price of melamine = 4200 ALL/sheet or 627 ALL/m^2 ;
- Ordering cost 10% of total cost = 62 ALL/m^2 **(S)**;
- Cost of holding one unit in inventory for a year = 46 ALL/melamine sheet **(H)**;
- Interest rate = 2%.

$$EOQ = \sqrt{\frac{2 * D * S}{H}}$$

$$EOQ = \sqrt{\frac{2 * 1680 * 62}{0.02 * 46}} = 481 \text{ m}^2$$

Economic Order Quantity that is calculated above refers: 72 melamine sheet with surface 6.7m^2 , or 84 melamine sheet with surface 5.7m^2 based on utilization coefficient (85%).

The owner of carpentry business based on utilization coefficient will buy 72 or 84 melamine sheet. This quantity fits to the current storing surface of carpentry business.

However, it is very important the time between receiving of replenishment orders of 72/84 melamine sheets, expressed as a fraction of a year.

$$TBO_{EOQ} = \frac{EOQ}{D} * \left(12 \ \frac{months}{year}\right) = \frac{481}{1680} * \left(12 \ \frac{months}{year}\right) = 3.4 \ month$$

Table 1. Comparative results of two inventory management methods

Term	Unit	EOQ technique	Current technique (manager experience)
Annual demand (chair)	chair	4200	4200
Order quantity (m^2)	m^2	481	605
No of order	number	3.5	4.3
Holding cost	ALL	274	345
Ordering cost	ALL	29.822	37.510
Total cost	ALL	30.096	37.855

Above the results analysis derive an important problem related to the facts that EOQ technique constitutes a starting point to orient the others decision-making based on analytical methods. In this case, manager can use linear programming to increase the utilization coefficient for each melamine sheet. Rossi et al (2017): ... developed an EOQ model for a multi-item framework, using mixed integer linear programming to conduct a case study.

Conclusions

From the research, we come out to some conclusions. Inventory is very important and a delicate factor for the producing activity of a business which is conditioned by internal and external motives which operate in intervention with each other. It is a managerial commitment that takes risk. It presents a synthesis challenging realities, professional competence, time restrictions, infrastructure problems, etc. The findings of this study, evidence that inventory management practices have a direct impact on the organizational performance of businesses because it reduces the holding, ordering costs, etc. The manager is in charge of inventory management practice.

Therefore, owners or manager of the businesses must to consider inventory management practice for positive performance and the best competitiveness.

This paper evidences empirical way on the basis of data obtained from business for inventory management importance and describes the relationship among inventory management practices and business performance. This paper is an attempt about using Economic Order Quantity (EOQ) technique model as a successfully technique for management inventories and indicate the significant positive impact of inventory management on SMEs performance. The finding of this study implies that managers need improve the inventory management practice. On the other hand, using the scientific inventory management techniques create the opportunity for using of other analytical decision-making methods that are successful.

Considering the level of knowing the managerial problems of the inventory problems in Albania the businessmen awareness for asking assistance in this direction is an urgent need.

The study results will present to Chamber of Commerce and Industry of Tirana to serve for training of owners and managers related to inventory management improvement.

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