

## **AUDIT AS A DECISION-MAKING INSTRUMENT IN INVENTORY MANAGEMENT**

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**Abstract:** In the paper, there has been discussed the issue of the instrumental role of audit in the area of decision-making concerning inventory management. The first part of the paper emphasizes the assessment of audit as a decision-making instrument in inventory management. The considerations presented in the second empirical part constitute the response to the research question. The aim of the paper is to learn and assess dependencies between the audit seen as a decision-making instrument and the efficiency of inventory management in the surveyed company. To respond to the research question there have been presented the results of the empirical research based on the case study. The conclusions from the research indicate that the implementation of the solutions proposed during the audit of inventories determines the efficiency of inventory management in the surveyed enterprise allowing for taking right decisions. In the paper, the authors wish to contribute to the discussion on the extent to which the enterprises of the cement sector in Poland should adapt audit to more efficiently manage production stock which generates high operating costs.

**Keywords:** *inventory management, audit, cement sector*

### **1. Introduction**

In the subject literature, it is assumed that decision-making is the transformation of information into a managerial decision [1]. Therefore, the decision must take into account the activities implementing it, which will bring about the occurrence of feedback, allowing for verifying its accuracy and efficiency in the light of current events [2]. In terms of inventories, the decisions concerning their level are one of the ways of rational management.

In the paper, the attention is drawn to the evolving nature of audit which is a modern management tool. For that reason, managers prefer the decision-making aspects of this process. Audit in the area of inventories is to allow managers to make independent and objective assessment of the system of inventory management taking into account risk management. Therefore, the authors of the paper put the research question – is audit an instrument supporting decision-making processes in the area of inventory management? Consequently, the aim of the paper was to fill in the gap by learning and assessing dependencies between the audit and the efficiency of inventory management in the surveyed company. The research methods applied to achieve the objective are literature studies, case study, trend analysis of the development of the level of inventories in the surveyed company of the cement sector. Inventory management in the enterprise of the cement industry is an important problem due to the seasonality of the activity of these business entities.

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## **2. The assessment of audit as a decision-making instrument in inventory management**

In literature, operational stocks in enterprises constitute the basic resource of current assets [3, 4, 5]. According to the Accounting Act, inventories [6, 7] include: materials, semi-finished products and work-in-progress, finished products, goods. Inventories are stated in the balance sheet in the item I of group B.

Inventory management is associated with the necessity to possess a large amount of information on the diversity, structure and level of stocks [8]. Rapidity and quality of the obtained information determines the efficiency of inventory management and allows to take right decisions in this area. Inventories generate costs which may have significant impact on the financial result and economic position of enterprises [9, 10]. Rational inventory management is the consequence of the conducted control and audit processes. Audit is directed towards the prevention of any type of risk [11, 12, 13, 14, 15], also the risk associated with costs of inventories. The Institute of Internal Auditors IIA – Poland formulated the definition according to which “audit is an independent objective activity, providing and advisory in nature, conducted in order to provide the enterprise with value added and improve its functioning. Audit supports the enterprise in achieving the intended objectives through systematic and consistent activities for the assessment and improvement of the efficiency of risk management, control system and processes of enterprise management” [16, 15]. The above definition comprehensively presents the essence of audit while emphasizing all its aspects.

To objectify the process of audit in the area of inventory management there was used the concept of indicators of the assessment of the relevance and level of risk. Risk analysis and the assessment of its scale will be conducted on the basis of the research using stock rotation rate on the extent and directions of deviation of the studied phenomena compared to the adopted basis. Stock rotation rate is characterized by high information capacity and decision-making. It can provide information on the occurrence of risks such as [17, 18, 19, 20]:

- the risk of disruptions in the process of supply, production and sale,
- the risk of loss of financial liquidity,
- the risk of decline in profitability,
- the risk of increased costs of frozen stock,
- the risk of increased inventory warehousing costs,
- the risk of loss of stock value in use,
- the risk of increased costs of ordering inventory,
- the risk of increased shortages or surpluses of stocks,
- the risk of increased old and redundant stocks,
- the risk of loss of customers or suppliers.

Calculating the rotation rate for inventories of materials and raw materials provides information on the possibility of the occurrence of the risk of interruption of the continuity of production in the conditions of fluctuations in delivery time. In the area of work-in-progress and semi-finished products, the rotation rate will provide information on the risk associated with the costs of freezing financial assets in the production process. Stock rotation rate defined in the area of finished products or goods will inform on the risk of interruption of the sales process, the risk associated with the availability of products for customers and the risk resulting from the ways and channels of distribution [21, 22].

The process of audit of inventories should include creating, warehousing and running out of stocks. In the area of creating stocks, the mechanisms of the functioning of the purchasing process should be subjected to verification. Decision-making processes having impact on the selection of the sources of stock supplies, organization of purchasing processes, volume of purchase, functioning of logistics support, setting limits on purchases of inventories and impact of stock purchase prices on the level of costs of the operating activities of enterprises should be subjected to analysis [23, 24]. In the area of storage of inventories, author studies should include the development of volumes and structure of material inventories and storage of stocks at the stage of purchasing to ensure materials and raw materials essential for the maintenance of the continuity of the production process. Audit in the area of work-in-progress and semi-finished products is aimed at the division of the whole production into stages allowing for the application of flexible total series that can be controlled [25, 26]. While examining the area of work-in-progress and semi-finished products there should be taken into account the area of warehouse management and all types of inventories subjected to storage. The results of the analysis of stocks should provide information on the extent of adjustment of the level of stocks to current and future needs and rapidity of their rotation. The analysis of inventories refers to the use of warehousing capacity and the evolution of costs of its functioning. The research in this field should indicate or eliminate the occurrence of redundant or excessive stocks revealing the lack of the efficiency of inventory management [27]. Audit in the area of finished products should include the verification of the sales structure with reference to the basic distribution channels. Inventories of finished products should have the ability to continuously meet the needs of customers and ensure the continuity of supply to customers. In the process of the depletion of stocks, the logistics support, inventory management of finished products and costs of the distribution stage should be subjected to verification [28, 29, 30, 31]. In *Table 1* there is presented the factor posing stock risk and the measure of its measurement.

*Table 1*  
*Risk measure in stock audit*

<b>Inventories of materials, semi-finished products and finished products in enterprises of the cement industry</b>	
Factor posing risk in the area of inventory	Frequency of replenishment of stocks
Risk measurement meter	Stock rotation rate = Revenue from the sales of stocks /Average inventory

(Source: Authors' own study)

In risk analysis in audit processes, there are used different types of scales developed on the basis of mathematical (estimation) methods using environmental analysis or risk scenarios. Rotation rates established for individual types of inventories are the basis for the overall assessment of risk at the strategic level.

### **3. The verification of decisions in the area of inventory management in the company of the cement industry**

Determining the level of risk on the basis of stock rotation rate ensures the acceleration of the flow of information essential for decision-making in the field of inventory management.

The specificity of stocks in the cement sector brings about that risk analysis in the area of inventories with the application of stock rotation rate allows to efficiently detect and prevent the occurrence of risk in the area of inventories and comprehensively control the procedures established in this field. To illustrate the above considerations there was presented the audit task whose subject was the assessment of the efficiency of inventory management in the cement sector. The audit task was performed over twelve subsequent calendar months of 2015 in one of cement plants in Poland. The empirical data were developed on the assumption of the specific production capacity occurring in the surveyed company. The range of the empirical data in the study referred to the volume of production, the volume of consumption, own cost of sales of stocks and the level of inventories, which allowed for illustrating the seasonality of production and sales and the development of inventory level in the cement sector. In order to quantify the audit process in inventory management in the surveyed company the set of empirical data was presented in terms of quantity.

While performing the audit task there were taken into account basic factors conditioning and limiting the functioning of the surveyed company. Inventory management in the surveyed company of the cement industry is conditioned by the factors such as: the seasonality of the activity, the volume of the demand, the level of the production capacity. The listed factors have direct impact on the development of the level of stocks in the enterprises of the cement industry. The seasonality of the businesses of the cement sector results from the climatic conditions which create the demand for cements in the construction industry. The demand for the products of the cement sector influences the level of inventories of semi-finished products and materials. The object of the audit in operational terms is to verify the efficiency of management of inventories of limestone, raw meal, clinker and cements. To verify the object of the audit there was adopted the assessment criterion according to which the production stocks in the surveyed company should be maintained at an optimal level. There should be also maintained appropriate proportions between the volume of production, the volume of consumption and the level of inventories of limestone, raw meal, clinker and cements. The verification of the object of the audit indicates (*Figure 1*) that the level of production of limestone and raw meal is stable (taking into account the seasonality of the sale). Production capacity of clinker is a bottleneck in the surveyed company. The implementation of the planned level of cement production was possible due to stock replenishment with external clinker. Clinker production is proportional to the production of limestone and raw meal. Cement production is dependent on the possibilities of clinker production. The level of inventories of limestone and raw meal is maintained at a relatively constant level. Inventories of clinker in the summer season exceeded the limits of safety stock. The level of inventories of cement was unstable, largely determined by the volume of the sale.

The conducted research shows that the ability to mine limestone exceeds its consumption in current production. The volume of extraction of limestone is subjected to the planned volume of production of raw meal. There are no shortages of raw meal in the surveyed company. The level of the volume of production, consumption and stocks is stable. This is due to the fact that the efficiency of the milling system of the raw material satisfies the demand of the rotary kilns for raw meal. Theoretical production capacity of the rotary kilns for clinker production is adjusted to the production capacity of the mills of the raw material. However, the outdated machine park generates an increased risk of failure in machinery and equipment. Therefore, the calendar working time is used in 85%, the

efficiency of the workflow channel falls whereas the unit cost of the manufacture of a ton of clinker rises. The efficiency of the cement milling system fully covers the needs in the field of cement production. The necessity to possess inventories results from the fact that the rate of consumption of raw materials and semi-finished products is faster than the rate of their production (Figure 1).

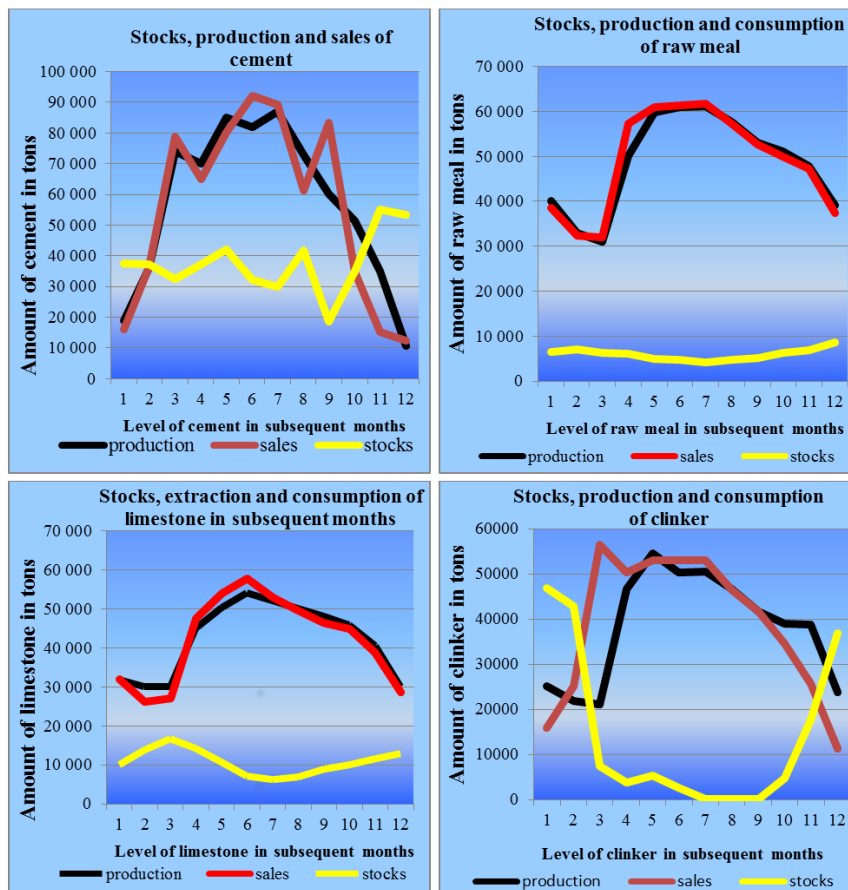


Figure 1. Verification of the efficiency of inventory management of cement, raw meal, limestone and clinker  
(Source: Authors' own study)

The verification of the object of the audit detected the risk concerning the low level of inventories of clinker which, in case of failure of the rotary kiln or reduction in performance of machinery and equipment, will bring about reduction in the volume of cement production. The study of the object of the audit shows that the decisions in the area of the cement sales planning were not precise. In the planning process it was not predicted that the structure of the demand for individual types of cement could change. The occurrence of the demand for other types of cements than planned produced changes in the production profile, leading to the occurrence of shortages in clinker stocks.

The recommendation for the audit in the area of the optimization of inventory management and prevention of irregularities in the future in the surveyed company is:

- during the process of repair of the furnace channels, the adjustment of the technological system so that the planned efficiency of the furnace systems could be achieved and to ensure their trouble-free operation for at least three quarters,
- while making a plan of cement production there should be taken into account external sources of clinker delivery not to let clinker stocks on the storage area fall below the level of safety stock,
- while building the cement sales plan, it is necessary to wholly analyse the volume of the demand for individual types of cement in subsequent months of the year.

The occurrence of bottlenecks in the operational activity of the surveyed company enforces the planning and implementation of production in substantial advance compared to the predicted volume of sales. Summing up, the processes of audit detect and eliminate disruptions in the flow of information on inventories and allow for an increase in the efficiency of inventory management in the company under consideration.

#### **4. Summary**

The aim of the paper was to learn and assess the dependencies between the audit regarded as a decision-making instrument and the efficiency of inventory management in the surveyed company. The empirical study was conducted in one of the enterprises of the cement sector in Poland. Carrying out the research process provides a limited possibility of scientific cognition. The constraints of the case study are: time-consuming nature, intuitiveness and subjectivity of judgments, high costs of the conducted studies and low representativeness of the results [32, 33, 34, 35, 36]. However, the advantage of the case study is the possibility to present an accurate and in-depth image of the examined phenomena and relationships. The conducted study supports the current view that the rapidity and quality of the solutions proposed in the process of audit determine the efficiency of inventory management in the company of the cement sector in Poland, allowing for taking right decisions in the area of inventory management.

While assessing the instrumental role of audit in decision-making processes in the field of inventory management on the basis of the audit research in the discussed company, it should be noted that economic consequences of managerial decisions are conditioned by the cement production technology and fluctuations in the demand for products of the cement sector. The main contribution of the paper is in-depth understanding of coexistence of mismatch of intensity of the stream of stock deliveries and the stream of their consumption in the cement sector enterprises, which enforces the storage of stocks and their control.

Clear implication resulting from the theoretical and empirical assumptions of the conducted case study is the fact that the managers of the enterprises of the cement sector in Poland should aim at rationalization of inventory management which, on the one hand, translates to reduction in inventory costs and, on the other, the necessity to maintain the continuity of production and sales. The integration of audit with inventory management ought to enable initiating the activities verifying the practical usability of the decisions taken. The optimization of the decisions in the area of inventory management should take into account the results of audit since they allow to detect and eliminate interruptions in the

flow of information on inventories. To achieve the objective of the paper there were used mainly literature studies, case study and the trend analysis of the development of the level of inventories in the surveyed company of the cement sector. The issues being the subject of the present paper are complex and up-to-date problems and indicate an interdisciplinary nature, which leads to further studies and investigations in this field.

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