Analysis of inventory with the example of Kloeckner & Co SE

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Abstract. International accounting is generally considered to be a new field of accounting. In order to comply with the trend of increasing internationalization of economic development, the field of accounting has been made more conceptually developed and practically useful and precise. Research on the main elements of international accounting focuses on accounting standards and financial reporting standards for multinational companies. According to economic reality, companies are involved in the manufacture of products, such as goods or services. At the end of each financial year, these inventories must be valued in order to show the value on the balance sheet at the relevant reporting date. Inventories are thus part of the working capital and thus affect the liquidity of the company. Now, the central issue in valuing inventories is to measure all payments related to production or purchases and to allocate them to individual inventories as acquisition costs or production costs. Inventories play an important role in terms of balance sheet assets and are interpreted by IAS 2. In the situation of the global financial crisis, the application of inventory models in the working capital management of companies is becoming more and more indispensable. For enterprises, a large amount of working capital needs to be used in the procurement and storage of goods, and many enterprises often have improper ratios of inventory funds, which in turn affects the normal operation of the enterprise. Inventory modeling theory is widely applied in enterprise working capital management, which can strengthen the ability of enterprises to deal with problems flexibly, and can respond to changes in consumer demand and competitive situation in a timely manner, and can develop countermeasures and solutions that are better than other competitors.

Keywords: international accounting, inventories, Kloeckner & Co SE.

1. Basic definitions

This chapter focuses on explaining the definition and details of expressing inventory according to the charter of international accounting. It then goes on to explain and analyze the measurement of inventory, divided into initial measurement, subsequent measurement, valuation simplification and inventory recognition as an expense.

1.1. Inventories

The objective of IAS 2 is to standardize the accounting for inventories. IAS 2 contains valuation rules for determining the cost of inventories and subsequently recognizing them as an expense, including any write-downs to net realizable value. The purpose of capitalizing inventories is to retain the costs incurred in the acquisition or production of inventories in equity until the resulting income is recognized. Inventories are, in principle, the current assets of the operator. After they have been manufactured or acquired, they are usually intended to be sold again relatively soon [1].

1.1.1. Definition of inventories

First, inventories are classified as current assets in accordance with IAS 1.57, i.e., as assets that are expected to be used or sold within one year or in the normal course of business.

Inventories are defined in IAS 2.6. Inventories are products or goods held for sale in the ordinary course of an entity's activities, work in progress, raw materials and supplies held in reserve during production or the rendering of services.

However, IAS 2 excludes certain inventories from its scope (IAS 2.2): Ongoing work under a construction contract, financial instruments, biological assets, and agricultural products harvested in connection with agricultural activities.

Although the following inventories are also within the scope of the standard, IAS 2 does not apply to the measurement of inventories held by (IAS 2.3): Producers of agricultural and forest products, post-harvest agricultural production, and minerals and mineral substances, in each case to the extent that such products are measured at net realizable value in accordance with well-established practice in their industry. When such inventories are measured at net realizable value, changes in value are recognized in the income statement in the period of the change. Commodity brokers/dealers that measure their inventories at net realizable value fewer selling expenses. If such inventories are measured at net realizable value fewer selling expenses, the changes in value are recognized in the income statement in the reporting period of the change.

1.1.2. Details

Regarding inventories, the provisions of IAS 2.36-39 contain detailed disclosure requirements. In the context of IFRS financial statements, this should include, among other things, the accounting policies for inventories, including allocation and measurement methods. simplification procedures for valuation, the total carrying number of inventories and the allocation of the carrying amount among entities, the carrying number of inventories carried at fair value less costs to sell, the number of inventories recognized as an expense in the period, the impairment losses and write-downs of inventories recognized in the period, the events that led to the impairment losses, and the carrying number of inventories pledged as collateral for liabilities. IAS 2 does not specify where the required disclosures should be made. Therefore, information can be provided not only in the notes, but also in the statement of financial position and statement of comprehensive income. The only thing that counts is the economic perspective. According to IAS 2.37, inventories are divided into goods, raw materials, supplies, work in progress and finished goods [2]

1.2. Valuation of inventories

Valuation is at acquisition or production cost at the time of receipt. Only if the net selling price is lower than the acquisition or production cost must the net selling price be written down through profit or loss.

1.2.1. For papers with more than six authors

The initial valuation is initially carried out at acquisition or production cost, i.e., at all costs incurred to bring the inventories to their present location and condition. As a rule, the individual valuation principle is applied, according to which each asset in the inventory must be valued separately.

Examples of acquisition costs (IAS 2.11): Purchase price, Import duties and other taxes, transportation costs, other costs directly attributable to the acquisition, Deduction of rebates, discounts, and similar amounts.

Examples of production costs (IAS 2.12ff): directly attributable costs, fixed and variable production overheads, for qualifying assets, also borrowing costs in accordance with IAS 23 (AS 247).

IAS 23 Borrowing Costs sets out some limited circumstances in which borrowing costs (interest) may be included in the cost of inventories that meet the definition of a qualifying asset (IAS 2.17 and IAS 23.4). Add author names horizontally, moving to a third row if needed for more than 8 authors.

1.2.2. Subsequent measurement of inventories

At the balance sheet date, inventories are measured at the lower of cost and net realizable value. If the cost of inventories is higher than their net realizable value, a provision for the impairment of inventories must be recognized and included in the result for the current period.

Net realizable value is the estimated selling price in the ordinary course of business less the estimated costs of completion, estimated selling expenses and applicable taxes; the cost of inventories is the actual cost of inventories at the end of the reporting period.

1.2.3. Valuation simplifications

According to IAS 2.23-24, inventories must be valued separately. This applies to inventories that are not normally interchangeable. Under IAS 2.24, separate allocation means that the costs incurred in each case are allocated to specific items of inventories. According to IAS 2.25, only the first-in, first-out method and the average cost method are considered simplified valuation methods.

Valuation simplification methods, which are subsequently divided into FIFO and mean value methods as simplified valuation methods, are further subdivided into weighted average, and moving average methods. Regardless of the valuation simplification method chosen, the resulting valuation should always be compared to the net realizable value and lower value reported in the balance sheet.

The standard cost method and the retrograde method may be used in determining cost, provided that the results approximate actual cost (IAS 2.21-22).

The cost of inventories that are not interchangeable is determined by allocating their individual costs (IAS 2.23).

For items that are interchangeable, IAS 2 permits the use of the FIFO method or the weighted average cost method (IAS 2.25). The use of the LIFO method, which was still permitted prior to the revision of IAS 2 in 2003, is no longer allowed.

The same cost method is to be applied to all inventories with similar characteristics in terms of type and use in the company. For groups of inventories whose characteristics differ, different cost methods may be justified (IAS 2.25).

1.2.4. Recognition as an expense

IAS 18 Revenue deals with the recognition of revenue. When inventories have been sold and revenue recognized, the carrying amount of those inventories shall be recognized as an expense (often referred to as cost of sales). Any write-down to net realizable value shall be recognized as an expense in the period in which it occurs. Any reversal shall be recognized in profit or loss in the period in which it occurs (IAS 2.34).

2. Theory

In this chapter stock turnover and stock range are analyzed in the sense of the theory of the inventory modeling. The inventory is analyzed with the help of the ABC analysis and the XYZ analysis. The analysis helps to understand the theoretical part better. For this reason, the importance of inventory management is to ensure that inventory meets sales demand in the most economical way, thereby reducing costs and increasing efficiency.

2.1. Theory of the Inventory Model

The inventory model collects data on raw material inventories, finished goods inventories and some work-in-process inventories. The core of this economic theory is that firms' inventories are procyclical, and that in times of upturn, firms' inventories increase to boost production. This procyclicality of inventories is characteristic of a market economy, and firms' inventory adjustment behavior is profit-maximizing and risk-minimizing market behavior in the sense that it is conducive to sustainable development and risk reduction. Focus on the use of inventory models to improve the efficiency of working capital utilization. Focus on capital analysis, rationalize working capital structure, identify potential problems that arise, and fully estimate possible risks [3].

2.1.1. Inventory turnover

The inventory turnover indicator calculates the inventory turnover measured by the turnover frequency. Inventory turnover thus shows the speed of rotation and reproduction of the capital tied up in inventory. In the analysis of inventories, material turnover plays a very important role. When optimizing inventories, the goal is to increase the inventory turnover. The inventory turnover rate reflects not only the speed of inventory turnover and the degree of inventory occupancy, but also, to a certain extent, how quickly the company's sales are realized. In general, the higher the inventory

turnover rate, the shorter the time it takes for the funds invested in inventories to be converted from inventories to sales, the faster the conversion of inventories into cash or receivables, etc., and the faster the funds are recovered. The strict minimum value principle applies to current assets.

2.1.2. Supply Range

For the inventory area, the number of days (calendar or working days) that the item is in stock (at a reference date) is calculated. Conversely, it can also be the number of days that have to be worked to generate the first euro of income that is not "stored" in stock at the same time. As the distance between the supplier and the customer increases, the range of the stock generally also increase.

Working capital inventory: Inventory maintained to meet daily production and operational needs. The size of working capital inventory is directly related to the purchase volume.

Safety stock: Inventory set up to prevent uncertainties.

Reconciliation Inventory: Inventory that is used to reconcile imbalances in demand and supply, imbalances in production rate and supply, and imbalances in output at each stage of production.

In-transit inventory: Inventory in transit and parked between two adjacent jobs or two adjacent organizations, the size of in-transit inventory depends on the transit time and the average demand during the period.

2.2. ABC analysis and XYZ analysis

With the help of both ABC and XYZ analysis, it is possible to divide events into classes and thus categorize them. The ABC/XYZ analysis combines both tools. For the problem of unreasonable inventory classification, an ABC-XYZ analysis matrix can be constructed with the classification criteria of inventory capital ratio and the degree of demand fluctuation.

2.2.1. Explanation of the ABC analysis

ABC analysis prioritizes and classifies objects into classes A, B, and C based on a metric, depending on how essential or insignificant the object is to the business. For each of the classes different methods and strategies can be developed then, which increase the economy. The ABC analysis (also known as Pareto analysis) is based on the Pareto principle. This empirically justified principle proceeds from the fact that only a small number of causes has a significant influence on a problem. Roughly speaking, this means that a small group of causes (e.g., about 10% of the items in a company, the so-called A-items) contribute significantly to an outcome (e.g., about 70% of sales). Conversely, a large group of causes (e.g., 70% of the items) contributes little to a result (e.g., 10% of sales, the so-called C-items). In between lies the category of so-called B articles.

2.2.2. XYZ analysis of inventories

XYZ analysis is a method of materials management. With the results you can check the predictability of the goods consumption and its regularity.

In the same way, the results of the analysis are used as a basis for procurement planning. With it you can determine whether a just-in-time delivery or a storage of the individual products is best for the enterprise.

The goods that fluctuate in consumption are divided into three different classes, X, Y, and Z. The analysis is based on the following criteria [4].

X-goods exhibit a very homogeneous, almost non-volatile demand process. Safety stocks for particularly high excess consumption are therefore generally not required. For X-goods, therefore, priority should be given to consumption-based deliveries.

Z-commodities have a high degree of demand volatility and low consumption predictability. Since consumption is completely irregular, purchases on a case-by-case basis are desirable.

Y-goods are in an intermediate position: seasonal fluctuations or consumption trends are indicated with moderate predictability. These items are purchased primarily for stockpiling [5].

Table 1 shows the XYZ analysis with X-goods, Y-goods, and Z-goods to analyze the predictable impact of inventories.

Table 1. XYZ analysis

Part class	Predictability Impacts	Impacts
X-goods	High	Potentially low inventory levels due to close delivery dates for consumption.
Y-goods	Medium	Low safety stock levels are essential.
Z-goods	None	Case-by-case procurement (for critical bottleneck components: safety stock required).

The XYZ analysis provides statements for an appropriate design of safety stocks.

In order to optimize the sale and profit of the products, a company needs an inventory that fits the consumption. It is important here that all products and materials are available, but keep storage costs as low as possible.

This is because high storage costs are caused by too much stock, as it causes costs for rent, insurance, or personnel. In addition, too much stored goods tie up the company's capital unnecessarily. During this time, it is only stored in the warehouse. In the same way, however, it could be used in other places and thus generate higher profits.

Nevertheless, a high availability of goods is important. Because by reacting quickly to customer requests, the company can build a good image and loyal customers.

With the XYZ analysis, companies have a way to implement these goals for each of the products individually. In this way, they develop optimal inventory management.

2.2.3. Recommendations for action - ABC XYZ analysis

With a high value portion (A) and a constant consumption (X) the procurement is well plannable. It is thus just in time or just in sequence possible. If the consumption is however rather sporadic (Z), this complicates planning strongly. You should order therefore rather after need. In this way, you avoid high tied-up capital and can use it in a better place.

If the importance is rather low (C), then the procurement is nevertheless well plannable with constant consumption (X). You should order goods thus after consumption. If it is however rather sporadically (Z), then no planning is necessary. If the commodity is needed nevertheless times, you can order it simply in this moment. It does not make sense to have such a product permanently in the camp in stock.

With the ABC XYZ analysis you can derive thus still more exact statements and recommendations for action than with one of the two methods alone.

3. Practical example

First, let's briefly introduce the basic situation of this company. Next, the disclosure of inventories in the annual financial statements and in the notes to inventories is analyzed in the light of this report. Finally, a description of the principles and valuation methods of the annual report is contained in the special section of the notes.

3.1. Kloeckner & Co SE

Kloeckner & Co SE is a German-based steel and metal distributor and operator of steel service centers. The company acts as a link between steel producers and consumers and is not affiliated with any steel producer. The company's customers are mainly small and medium-sized steel and metal consumers, primarily in the construction, machinery, and equipment, automotive, appliance, consumer goods and other industries. The company also supplies intermediate products to the automotive, shipbuilding and consumer goods industries. Kloeckner & Co SE serves more than 90,000 customers through its distribution and service network of around 150 locations in 13 countries. At the same time, as a pioneer in the digital transformation of the steel industry, Kloeckner & Co SE has set itself the goal of digitizing and largely automating its supply and service chains. In this way,

the company aims to become the leading one-stop store for steel, other materials, equipment and processing services in Europe and the Americas.

3.2. Analysis of inventories in financial statements

Table 2 shows the assets of Kloeckner & Co SE in 2021.

Table 2. Assets of Kloeckner & Co SE in 2021

TABLE I. (IN T€)	TABLE II. 31.12.2021
TABLE III. INTANGIBLE ASSETS	TABLE IV. 97,389
TABLE V. PROPERTY, PLANT AND EQUIPMENT	TABLE VI. 760,354
TABLE VII. OTHER ASSETS	TABLE VIII. 241,546
TABLE IX. TOTAL NON-CURRENT ASSETS	TABLE X. 1,099,287
TABLE XI. INVENTORIES	TABLE XII. 1,715,723
TABLE XIII. TRADE ACCOUNTS RECEIVABLE	TABLE XIV. 843,284
TABLE XV. CONTRACT ASSETS	TABLE XVI. 41,86
TABLE XVII. OTHER ASSETS	TABLE XVIII. 115,825
TABLE XIX. CASH AND CASH EQUIVALENTS	TABLE XX. 57,628
TABLE XXI. ASSETS HELD FOR SALE	TABLE XXII. 4,154
TABLE XXIII. TOTAL CURRENT ASSETS	TABLE XXIV. 2,778,475
TABLE XXV. TOTAL ASSETS	TABLE XXVI. 3,877,762

Table 2 shows the assets of Kloeckner & Co SE in 2021, in which inventories are a current asset and have a large weighting in their value. The value of inventories in 2021 is 1,715,723. Inventory turnover rate measures how fast a company turns over its inventories in a year. A high inventory turnover rate means that the company has less inventory. As a result, the company spends less money on storage, depreciation, and obsolete inventory. However, too low inventory levels can affect sales, as the company may not have enough funds to meet demand. As of December 2021, Kloeckner & Co SE had an inventory turnover ratio of: 4.21. In particular, the XYZ analysis and the ABC analysis provide information on the appropriate design of safety stock. For this purpose, it can be determined, where the stocks of the enterprise are in relation to the assets and the subsequent disposal of the stocks.

3.3. Analysis of the disclosures in the notes on inventories

Table 3 shows the inventories in the notes to the consolidated financial statements of Kloeckner & Co SE.

Table 3. Inventories in Notes to the Consolidated Financial Statements

TABLE XXVII. (IN T€)	TABLE XXVIII. 31.12.2021
TABLE XXIX. GOODS	TABLE XXX. 934,607
TABLE XXXI. RAW MATERIALS AND SUPPLIES	TABLE XXXII. 694,623
TABLE XXXIII. FINISHED GOODS	TABLE XXXIV. 62,681
TABLE XXXV. WORK IN PROGRESS	TABLE XXXVI. 23,812
TABLE XXXVII. INVENTORIES	TABLE XXXVIII. 1,715,723

Table 3 explains the inventories in the notes to the consolidated financial statements and breaks down inventories by various areas of application. Of the inventories recognized as of December 31, 2021, €311,128 thousand are carried at their net realizable values. The write-downs to net realizable value amount to €30,676k. The change in the valuation allowance (addition) recognized in profit or loss in the fiscal year amounted to €1,389k. The amount of inventories recognized as an expense corresponds to the cost of raw materials and supplies and of purchased merchandise. In addition to the customary retention of title, inventories with a carrying amount of € 760,919k serve as collateral for financial liabilities.

3.4. Analysis of the notes on principles and valuation methods

Inventories are recognized at the lower of cost and net realizable value. In determining the net realizable value, assumptions must be made, regarding the setting of the selling price and the costs to be incurred until the sale. Production costs comprise all production costs determined based on normal production capacity. In addition to directly attributable costs, appropriate portions of attributable material and production overheads, including production-related depreciation, are also included in the cost of sales (e.g., for certain coil inventories). Normally, the valuations are based on average values updated monthly. In individual cases, the acquisition or production costs are determined separately.

The consolidated financial statements as of December 31, 2021 will be prepared in accordance with International Financial Reporting Standards. From December 31, 2021, all mandatory IFRS and the relevant interpretations of the International Financial Reporting Standards Interpretation Committee will apply. The financial statements of the companies included in the consolidated financial statements are based on uniform accounting policies prepared as of the reporting date of the consolidated financial statements. The consolidated financial statements have been prepared in euros. Unless otherwise stated, all amounts are expressed in thousands of euros. Deviations from unrounded amounts may occur. The consolidated financial statements have been prepared on the historical cost basis, except for certain financial instruments and pension obligations which have been measured at fair value.

4. Summary

First, the first part introduces problem statement, objective, structure of the paper. Problem statement is a great background that allows the reader to quickly get a better feel and understanding of the main content of the article, objective raises three questions from basic to exploratory and is also structure of the work. The structure of the essay, with which the essay becomes clearer and more concise.

Chapter 1, which is mainly theoretical, explains the definition of inventories and disclosures, followed by an introduction to the valuation of inventories, which is divided into initial valuation and subsequent valuation. The content of the article can be better understood by readers without specialized knowledge. The first problem from Objectives has been solved.

In chapter 2 inventory turnover and inventory range are analyzed after the theory of the inventory model. It follows 3.2 ABC analysis and XYZ analysis for the analysis of the stocks. Here the theoretical part goes still further. Thus, the second problem of the objective is solved.

In chapter 3 the practical part follows. By the example of the Kloeckner & Co SE the data to the stocks in the financial statements and in the appendix to the stocks are analyzed. A description of the principles and valuation methods used in the annual report concludes with an explanation of which methods Kloeckner & Co SE uses and how the results are presented. Finally, the third exploratory question on the objective is discussed.

Finally, there is the summary, which is curiously analyzed and clearly presented.

References

[1] U. Geismann, “Basiswissen Buchführung. Kompakter Einstieg in Bilanzierung und Bewertung,” Wiesbaden: Springer Gabler, p. 38, 2016.

[2] B. Pellens, et al., 2014., Internationale Rechnungslegung. IFRS 1 bis 13, IAS 1 bis 41, IFRIC-Interpretationen, Standardentwürfe Mit Beispielen, Aufgaben und Fallstudie, p. 473, Stuttgart: Schäffer-Poeschel, 2014.

[3] Li X M, Wang Q, 2013: Anwendung und Analyse von Bestandsmodellen in der Betriebskapitalverwaltung von Unternehmen, China [J]. Guide to Business, 2013 (19): 49-50.

[4] Zhao R, Lei B, Zhao T. Optimierung der Klassifizierung von Maschinenlieferbeständen auf der Grundlage der ABC-XYZ-Analysematrix, China [J]. Logistics & Material Handling, 2021, 26(08): 116-120.

[5] H.-J, Klepzig, 2014., Supply Chain Management. Grundlagen, Strategien, Instrumente und Controlling, p. 56, Wiesbaden: Springer Gabler, 2017.