

TOOLS OF MANAGERIAL ACCOUNTING IN PRODUCTION MANAGEMENT

Grzegorz Zimon

Department of Finance, Banking and Accounting, Rzeszow University of Technology,
Rzeszów 35-505, Poland, E-mail: gzimon@prz.edu.pl

Abstract: Increasing competition in the markets is not just a problem of commercial enterprises, but also manufacturers. Purchasing organizations which appear in any branch weaken the negotiating position of producers. Manufacturing companies are forced to look for solutions that will allow them to produce items with an attractive price but also of high quality. The quality of products and services offered is very important, but purchasers still mainly depend on the price of products or services offered. Therefore, manufacturers are forced to a systematic and thorough inspection costs incurred at each stage of production. The aim of this article is to present the tools of managerial accounting to support the process of production management. The article presents the tools which provide information for optimizing production costs and make it easier to make short-term decisions. The tools presented have a major impact on the efficiency of production management and lead to improvement of financial results.

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1. INTRODUCTION

The process of fighting for a customer is extremely important for businesses. Micro, small or medium-sized businesses often combine to increase their purchasing power and to be able to pressure the manufacturer and gain a better position in the negotiations. Individuals often organize themselves in the same way to purchase the goods or services. Large companies also set up purchasing organizations. If this focus on the price of a product or a service starts with a single retail client, its accumulation is on the negotiating line of the wholesaler manufacturer. These actions are mainly reflected in producers who are slowly beginning to wonder whether to put on price or quality. An additional obstacle is the area of activity. In recent times it has expanded, because in addition to the production process itself, the manufacturer is obliged to organize and launch an authorized service. Additionally, there is recycling of products manufactured by the company whose life cycle has already been completed (Pajak, Klimkiewicz & Kosieradzka, 2014, p.20). All this increases the size and complexity of the structure of the business. This necessitates the separation of pure production from other services. There are complex organizational structures in the enterprise, starting with indirect production departments, ending up in administrative units. These changes make it difficult to analyze and evaluate the manufacturing process. They obstruct and obscure the financial picture of the company, the distribution of costs, revenues, making it difficult to take quick and accurate decisions. A manufacturer must produce such a product that will be of high quality and attractive price, which will be accepted by the contractors. However, it is difficult to obtain such a result. Achieving such results requires knowledge of the costs involved and the use of methods that allow them to be controlled and optimized in areas where cost reductions will not result in loss of quality. For this purpose, a good solution for the production management staff is to use appropriate methods and tools derived from managerial accounting areas. Their application provides management with a range of information on costs and should be an incentive for changes to improve the functioning of what is the "heart" of the enterprise, i.e. the production system of manufacturing companies.

2. COST OF PRODUCT MANUFACTURING

In the case of production management the most important for company is to obtain detailed information on the cost of product manufacturing. This information is the basis for determining the profitability of production, the effectiveness of managing individual assets, as well as the basic information when determining the price of a manufactured product. Correct pricing of the product gives the company the knowledge of the profitability of production of assortment groups and

production lines (Leszczyński, 2012, p. 207). The level of costs incurred is the basis for assessing the cost position, which is considered to be the key success factors (Nowak, 2016, p. 6). In manufacturing companies to assess the level of costs incurred, the knowledge of the cost of the product is the key information.

According to the Accounting Act, the cost of manufacturing a product includes costs directly related to a given product and a reasonable part of costs indirectly associated with the product. Direct costs include the amount of direct materials consumed, the costs of acquiring and processing directly related to production and other costs incurred in bringing the product to its original form and location on the valuation date. A justified portion of indirect costs relevant to the production period of the product is the variable indirect production costs and the part of the fixed intermediate production costs that corresponds to the level of these costs, with normal capacity utilization. The normal capacity utilization rate is defined as the average expected production volume for a given number of periods or season taking into account planned repairs (Accounting Act).

The costs of product manufacturing do not include the costs:

- resulting from unused capacity and production losses;
- general management;
- storage of finished goods and semi-finished products, unless these costs are necessary in the production process;
- costs of selling products.

These costs affect the financial result of the reporting period in which they were incurred.

It is clear that two groups of costs in manufacturing companies have an impact on financial performance. These are both direct and indirect costs. In the case of direct costs the calculation process, i.e. assigning the corresponding cost items to the manufactured product is not a big problem. For example, based on the *Rw* stock documents, one can adjust the cost of materials used for each product. The situation is similar in case of remunerations. On the basis of accounting documents one can determine what employees and how much time they employees spent when producing the products concerned. Problems arise in the case of department costs, otherwise called indirect.

3. SYSTEM OF COSTS ACCOUNTING

The most important information about the functioning of the production department is the production cost of the product. If the cost of production is presented on a spreadsheet basis, the business manager receives a series of information on the efficiency of the use of the individual assets. The first step one needs to take to obtain this type of information is to create an appropriate cost accounting system. Companies have an opportunity to use simplified methods, but

the best option is to use a full cost accounting system backed by an extensive analytical accounts plan. Costs in an enterprise may be grouped in two different sections (Nowak, 2003, p. 63):

- by kind (accounts of team no. 4),
- by type of activity (account of team no. 5).

These are simplified cost accounting systems. However, the most information is provided by the third method, which is defined as the full cost accounting using team accounts 4 and 5 together. In the production or service enterprises, the simplified cost accounting option is only used in team 5 accounts. The following accounts are included in this cost group (Zimon, 2015, pp. 459–470):

- Costs of core activities, i.e. those related to the core business of the unit, e.g. costs of consumed materials, raw materials for production, direct packaging, remuneration of production staff. As a part of the core business, production, service and commercial activities are distinguished.
- Faculty costs, i.e. indirect costs, generated at production departments, including maintenance of machinery and equipment, faculty administration, depreciation costs,
- Costs of sales, costs related to customer service and acquisition of new products, goods and services, such as shipping costs, packaging, marketing research costs, salaries of employees directly in the sales department,
- Costs of ancillary activities include the units that are allocated within the department that provide services to other business units. Examples of auxiliary activities include internal servicing of equipment, repairs for production and administration departments,
- Management costs, including administrative and management costs, such as management board remunerations, administrative costs, general production costs, maintenance costs of materials and finished goods stores, office maintenance costs

The second simplified possibility of costs accounting is the use of team accounts no. 4. The accounts of team no. 4, i.e. the costs by kind include (Zimon, 2015, pp. 459–470):

- Depreciation, amortization allowances are depreciated on fixed assets and intangible assets,
- Consumption of materials and energy, it includes the costs of consumable primary and auxiliary materials, fuels, packaging, office supplies, magazines, etc.,
- External services, costs of performed works and services by other entities to the entity, e.g. transport services, rental services, leasing, banking services, IT services
- Taxes and fees, stamp duty, administration fees, notary fees, court fees, transport tax, real estate tax, non-deductible tax,

- Remuneration, costs of monetary remuneration or benefits in kind paid to the employees of the entity under an employment contract, contract of engagement, work contract and others,
- Insurance and other benefits, costs of social security contributions in the part incurred by the employer, costs of contributions to the obligatory Labor Fund, Guaranteed Employee Benefits Fund, Pension Fund, and training costs for employees, write-offs on the company social benefits fund, health and safety at work,
- Other generic costs that cannot be included in the groups described above, e.g. employee travel expenses, representation costs, advertising costs, lump sums paid to employees for private use for business purposes, costs of contributions to the organization, whose affiliation is compulsory.

The third most costly system of cost accounting is the use of team accounts no. 5 and 4 together. Inventory of costs by type and by type of activity together gives a detailed picture of the costs incurred. This is a complete expense record. In this way, the cost accounting units receive information about the type of costs incurred and the locations (departments) where they are billed. Below there is an example of full cost accounting using analytical accounts.

Example

Based on the RW document materials A were issued for consumption of PLN 20,000, of which PLN 14 000 relates to basic production and PLN 6 000 to sales. In addition, the company keeps ancillary accounts for basic production and separately recognizes the production of e.g. VEGA and LEX products. The simplified diagram of the register is shown in Figure 1.

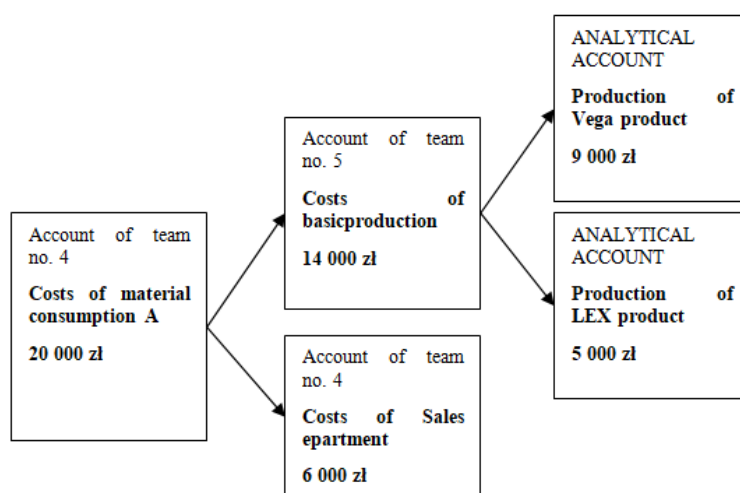


Fig. 1. Simplified diagram of full cost accounting; own research

This extensive system of records should be used in every company as it provides information on the type of costs incurred and at the same time indicates places, departments where there are individual costs incurred.

4. DIVISION KEYS

Indirect costs or department costs are an inherent component of the manufactured products. Due to the fact that on the basis of their source documentation they cannot be directly attributed to individual reference units, i.e. on the cost carriers or places of their creation, they are accounted for using the keys of the division also referred to as the settlement keys (Gabrusewicz, Kamela-Sowińska & Poetschke, 2002, p. 159). The most common cost carriers are the products. Pursuant to the Accounting Act, products are manufactured or processed by the entity in kind, current assets for sales (finished products – goods and services) or in production as well as semi-finished products. The balance sheet law therefore classifies work products from the point of view of the degree of their processing or their place (phase, stage) in the technological process (Accounting Act). The concept and classification of the products is as follows:

- finished goods (finished products), own products whose technological manufacturing process has been completed and delivered to the ordering party for collection or transferred to the warehouse or directly to the customers,
- semi-finished products which, after a certain phase of the technological process, are transferred to the warehouse and then are destined for further processing in subsequent phases of the technological process,
- work in progress includes products that are in the process of manufacturing operations. They are not included in the warehouse management because they are further processed at the manufacturing facilities (Karamańska, 2006, p. 551).

Indirect costs are those costs which, on the basis of source evidence, cannot be directly attributed to the production cost of a given production. According to the Act on Accounting, this is the so-called a reasonable part of the costs indirectly associated with the manufacture of the product, which includes: (1) variable indirect costs of production (e.g. consumption of auxiliary materials, transport costs), the size of which depends on the volume of production (in addition to losses and production losses that are not a part of the cost of production) and (2) that part of the fixed indirect production costs (e.g. depreciation, real estate taxes, independent remuneration, such as managerial and production payrolls, maintenance workers and other costs that are independent of production) that correspond to those levels with normal capacity utilization.

The normal capacity utilization rate is defined as the average expected production volume for a given number of periods or seasons, taking into account planned repairs. The costs resulting from unused capacity relate to the account used to record the costs of sold production. Units whose financial statements are not subject to mandatory auditing by the auditor may include direct costs and indirect ones associated with the production of the product, regardless of the level of capacity used.

The basic problem related to the settlement of individual items of indirect costs on cost reference objects is the selection of appropriate accounting keys. The division keys are used to assign departmental costs to particular products. The cost accounting key is a certain amount of support that is the basis for settling the sum of indirect costs between the various cost reference objects. The settlement key should be the cost reference object parameter expressing the actual or contractual relationship between the settlement base and the settlement costs. If a given value could act as the intermediate cost accounting key, it must meet certain conditions. Here are the most important ones (Nowak, 2005, p.101): (1) the settlement key should be left in causal relation with cleared costs, (2) the settlement key should be proportionate to the settled costs, (3) the settlement key relationship with the settlement costs should be as strong as possible, (4) the settlement key should be a parameter characterizing these cost reference objects, to which indirect costs will be settled, (5) it must be possible to explicitly assign the number of key units to cost reference objects.

For example, the settlement keys for department costs can be:

- in labour-intensive production, direct remuneration,
- in material-intensive production, the amount of materials used,
- for the calculations of the costs associated with the consumption of gas, energy for heating of faculty rooms, the key may be the area of the hall where the production of the products concerned is located.

Poorly aligned keys can distort the cost of producing individual products, so it is important that they are rationally selected for each of the groups of indirect costs.

5. COST OF UNUSED PRODUCTION CAPACITY

Another cost item that needs to be monitored and analyzed is the cost of unused capacity. These costs arise when an entity does not fully use the production resources involved. The lack of capacity is attributable to the entity's ongoing costs, which are a reflection of the entity's long-term commitment to material assets (i.e. depreciation and maintenance costs independent of the use of machinery and equipment and production buildings). An additional factor contributing to such costs is the waste of time through poorly organized production lines to a large

extent limiting normal production capacity (Wojakowski & Warszołek, 2017, pp. 41–51).

The essence of the method of valuation provided in the Act is not to increase the unit cost of production by the effect of low production level or not using parts of machines and equipment. The cost of unused capacity refers to the cost of products sold. In order to calculate the cost of unused capacity (*Knzp*), the following formula can be used:

$$Knzp = \text{Unused capacity} * (\text{Fixed costs}/\text{normal production capacity})$$

Bellwether is an example of how the costs of unused capacities are calculated.

Example

Data for July in the selected production company:

- faculty fixed costs PLN 15,000,
- normal production capacity of 30,000 units,
- actual production capacity of 27,000 units,
- unused production capacity pcs

In this example unused capacity is 3,000 units (30,000 units - 27,000 units).

$$Knzp = 3\ 000\ pcs * (15\ 000\ PLN / 30\ 000\ pcs) = 3\ 000\ pcs * 0,5\ PLN/pcs = 1500\ PLN$$

In the given period the cost of unused production capacity is 1500 PLN

Costs of PLN 1500 are the costs of unused capacities and should not be included in the unit cost of product manufacturing.

6. VARIABLE COSTS ACCOUNTING

The variable cost accounting is a short-term cost management tool in a company using a breakdown of costs into fixed and variable costs in relation to the volume of production. Compared to the mandatory full cost accounting. In the variable cost account, only variable operating costs are used to measure the product.

Variable costs are costs that change proportionally to changes at the level of a specific factor, such as the size of production, the size of employment or working time. For example, an increase in the size of production results in a change in the consumption of raw materials (Świdarska, 2010, p. 228). In turn, fixed costs are costs that do not depend on the change in production. Fixed costs do not change in the short run (Atkinson, Kaplan, Matsumura & Young, 2012, p. 66). The typical flow of cost information in the full cost is presented in Figure 2.

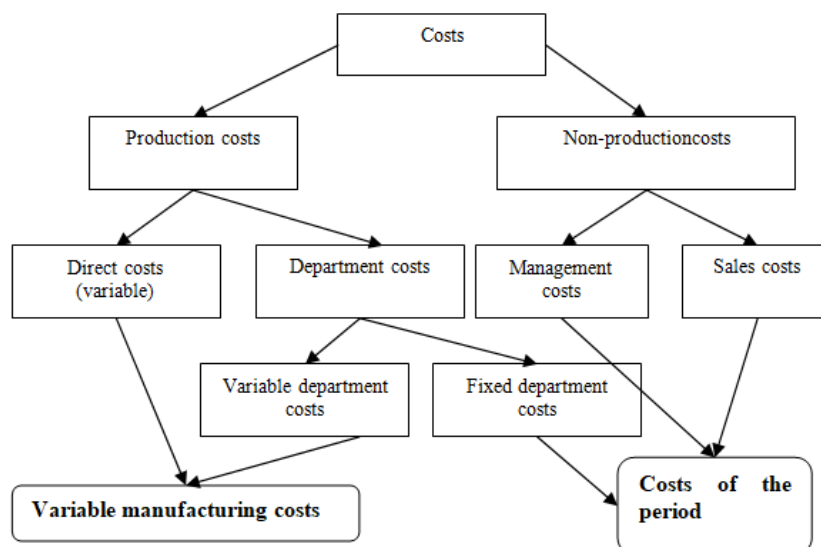


Fig. 2. Flow of cost information in variable cost accounting; own research

In the figure above it is evident that in the variable cost account the costs of production are only variable costs, i.e. these costs which change with the change of production volume. All fixed costs are defined as the cost of the period and are charged to the company's profit. The use of this cost accounting is useful in the conditions of unused capacity and in the occurrence of fluctuations in market demand (Czubakowska, Gabrusewicz & Nowak, 2014, p. 242).

7. AN ANALYSIS OF BREAK-EVEN POINT

In production management it is important to answer the question of when sales of manufactured products will be profitable. From the point of view of the existence of a company it is important to design a minimum production volume whose sales will minimize the costs incurred (Gabrusewicz, Kamela-Sowińska & Poetschke, 2002, p. 301). The sales volume that balances the costs incurred is defined as the break-even point (BEP) or, as a critical point. The break-even point means the sales volume of products where sales revenue is equal to the total cost of core operating activities, i.e. the result on sales is zero (Świdarska, 2010, p. 242). This is the amount that balances revenue with fixed and variable costs (Shim & Siegel, 2009, p. 156). The following equality occurs at the break-even point (Czubakowska, Gabrusewicz & Nowak, 2014, p. 242).

$$Ps = Kc$$

Where,

Ps – incomes from sales

Kc – total operating costs

The break-even point can be calculated according to value and quantitatively. The quantitative one tells you how much sales you have to make. As for the value one, it gives information on the amount of sales revenue in PLN, which should be achieved so that the financial result is equal to zero.

$$Pri = Ks / c - kz$$

Where,

Pri – quantitative break-even point

Ks – fixed costs

C – product price

Kz – unitary variable cost

In order to calculate the value break-even point, the formula for the quantitative one can be used:

$$Prw = Pri * C$$

Where,

Prw – value break-even point

Profitability break-even points are a part of the analysis of the output-cost-profit relation, which is a systematic study of relationships between changes in production volume and changes in sales revenue, costs incurred and sales result (Świdarska, 2010, p. 235). The basis for performing such analyzes is to divide the costs into fixed and variable ones.

8. BENCHMARKING

The process of cost control should be backed up with benchmarking. This is an analytical method that allows to identify and evaluate a long-term progress in selected areas (Magruk, 2017, p. 46-55). Benchmarking or comparison with the best. This is a very effective tool supporting the company's managerial process. This technique is difficult to accomplish if we try to compare with a direct competitor because of the difficulty of obtaining the information we are interested in. In a large manufacturing company producing a variety of products, the simplest type of benchmarking can be used successfully. Internal benchmarking is considered the easiest because of the ease of access to all financial and non-financial data (Kowalak, 2009, p. 75). In production units, benchmarking can be

effective, especially in the area of inventory management or production. Comparison of the organization of the production process of individual products can have a positive impact on the quality of the manufactured products, shortening production time or reducing costs.

Benchmarking is very useful for inventory management. The warehouse operations have a number of advantages, such as organizing warehouse work, evaluating methods used to manage individual assortments, receiving and arranging supplies, setting assortment, managing pallets. Benchmarking in stock should lead to improved inventory turnover and lower inventory.

9. CONCLUSION

Reliable information on the cost of product manufacturing, skilful distribution of costs on the variable and constant creates a reliable basis for decision-making in optimizing the assortment structure of manufactured products and optimizing the use of resources. If the business managers do not accumulate unnecessary stocks under unsuccessful orders, then using the individual tools from the areas of management accounting, then they are able to reduce costs in a very short time. This, however, requires the creation of an appropriate system of cost accounting and subsequent systematic control of the costs incurred. Additional information derived from the profit-to-cost analysis, the variable cost accounting, the cost of unused capacities, and the appropriate combination keys, or benchmarking allow to maximize profits in manufacturing companies.

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BIOGRAPHICAL NOTES

Grzegorz Zimon is an Assistant Professor at Rzeszow University of Technology, at the Faculty of Management in the Department of Finance, Banking and Accounting. Research interests focus on the issues related to management accounting, capital management and cost management in logistics. He teaches the following courses: Cost Management, Cost Management in Transport, Costs Account of Logistic Activities, Accounting, Managerial Accounting.