



Target costing as an element of the hard coal extraction cost planning process

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Abstract

Striving for the efficiency of activities is of great significance in the management of hard coal extractive enterprises, which are constantly subjected to the process of restructuring. Effective cost management is an important condition of the increase in the efficiency of the researched business entities' activity. One of the tools whose basic objective is conscious influencing cost levels is target costing. The aim of this article is to analyse the conditions of implementing target costing in the planning of hard coal extraction costs in hard coal mines in Poland. The subject area raises a topical and important problem of the scope of solutions concerning cost analysis in hard coal mines in Poland, which has not been thoroughly researched yet. To achieve the abovementioned aim, the theoretical works of the subject area have been referenced. The mine management process is difficult and requires the application of best suited and most modern tools, including those used in the planning process of hard coal extraction costs in order to support the economic efficiency of mining operations. The use of the target costing concept in the planning of hard coal mine operations aims to support the decision-making process, so as to achieve a specified level of economic efficiency of the operations carried out in a territorially designated site of hard coal extraction.

Keywords: extraction costs, hard coal mine cost planning, target costing.

Streszczenie

Rachunek kosztów docelowych (*target costing*) jako element planowania kosztów wydobycia węgla kamiennego

Dążenie do efektywności działania ma ogromne znaczenie w zarządzaniu działalnością przedsiębiorstw wydobywczych węgla kamiennego, przechodzących ciągle przez proces restrukturyzacji. Istotnym warunkiem wzrostu efektywności działania podmiotów gospodarczych jest efektywne zarządzanie kosztami. Jednym z narzędzi, którego podstawowym celem jest świadome oddziaływanie przez menedżerów na poziom kosztów, jest *target costing*. Celem artykułu jest analiza uwarunkowań wdrożenia *target costing* w planowaniu kosztów wydobycia węgla kamiennego w kopalniach węgla kamiennego w Polsce. W podjętej tematyce poruszono aktualny i ważny problem rozwiązań w zakresie analizy kosztów w tego typu kopalniach w Polsce, który wciąż jest w niedostatecznym zakresie zbadany. Realizując powyższy cel odwołano się do dorobku teoretycznego badanej problematyki. Trudny proces zarządzania kopalniami wymaga wykorzystania najlepiej dopasowanych, nowoczesnych narzędzi, w tym w procesie planowania kosztów wydobycia węgla kamiennego dla wspomagania ekonomicznej efektywności prowadzonej działalności górniczej. Wykorzystanie koncepcji rachunku kosztów docelowych w planowaniu działalności kopalni węgla kamiennego ma na celu wspieranie procesu podejmowania decyzji dla osiągnięcia określonego poziomu ekonomicznej efektywności prowadzonej działalności w określonym terytorialnie miejscu wydobycia węgla kamiennego.

Słowa kluczowe: koszty wydobycia, planowanie kosztów kopalni węgla kamiennego, *target costing*.

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Introduction

Effective cost management is a significant condition required to raise the efficiency of operations carried out by a business entity. Throughout history, many different tools allowing for cost level rationalisation have been developed. Thus, different systems, including procedures and target costing tools, have been created. The appropriate usage of target costing may influence the level of incurred expenses, thereby increasing the effectiveness of operations. Striving for operational efficiency is of great importance in the management of hard coal extraction enterprises, which go through constant processes of restructuring. Growing competition of global mineral exporters offering relatively low hard coal prices, as well as the rise of extraction costs caused mainly by the necessity to reach for deeper deposits and the changeability of geological and coalmining conditions, make the financial situation of hard coal mining enterprises even more difficult.

The aim of this article is to analyse the conditions of implementing target costing in the planning of hard coal extraction costs in hard coal mines in Poland. To achieve the abovementioned aim the theoretical works of the subject area have been referenced. The originality of the article relies on presenting the possibility of applying a modern tool from the field of cost accounting (target costing) in the process of hard coal extraction cost planning, as well as taking into consideration the character of operations taking place in hard coal mines.

1. Premises of searching for modern tools from the field of cost accounting in the process of planning operations in hard coal mines

Hard coal extractive enterprises deal with hard coal extraction, with its enrichment in treatment plants, during which the mineral is transformed to a form enabling its exploitation, as well as with its sale. The extractive industry is characterised by many different variables that meaningfully determine methods and tools of target costing. The effective usage of the latter may positively influence the hard coal mine management process. A target costing system should generate information that would, on the one hand, adequately satisfy the informational demand of the managers and, on the other hand, enable all the functions of entity management to be performed both in operational and strategic aspects.

An important area of supporting managerial functions performed in a hard coal mine is the improvement of the decision making process by means of the correct fulfilment of planning and target costing functions. Target costing should support the process of exploitation planning and the productivity assessment of the processes in progress, predominantly hard coal extraction. The most important elements of a mine, from the

viewpoint of achieving the extraction process aims, are the field of exploitation and the longwalls that create it, which is why they should be evaluated, among others, in terms of extraction profitability.

A significant element determining the effectiveness of the mining operations is the hard coal sourcing (extraction) cost. It is one of the basic indicating instruments that help to assess a hard coal mine activity. It is also a gauge that reflects the hard coal production cost and its structure, as well as the scale of extraction. One characteristic feature of the mining activity is the fact that hard coal is mostly extracted from many longwalls simultaneously. These longwalls function as though they were separate centres generating the product (coal) with a different composition, coal content, and qualitative parameters of raw coal, as well as functioning in specific and inimitable geological and coalmining conditions.

The direct costs that fall for hard coal originating from a specific wall (direct costs of coal production) occur at the stage of its exploitation from the coalface (longwall). These costs are incurred in relation to the usage of materials during the exploitation, remuneration, and mark-up of employees extracting coal directly from a particular wall, the transport costs directly from a particular wall, as well as other direct costs, such as depreciation of machines and devices used in a particular exploitation site. The other costs are usually indirect. Apart from the costs related outright to the process of coal extraction, they also include the costs of: coal enrichment (processing), environmental protection, workplace health and safety (WHS) in the principal mine, waste management, other works on the ground, including oversight on the surface of the principal mine, and costs related with mining damage (Figure 1).

Figure 1. Structure of hard coal production (sourcing) cost

| COST OF HARD COAL PRODUCTION (SOURCING) FROM A PARTICULAR LONGWALL | | | |
|---|--------------------------------|--|------------------------------|
| Direct costs | Indirect costs | | |
| Direct costs | Indirect extraction costs | Indirect costs of coal mechanical processing | Other indirect costs |
| Costs of materials Costs of remuneration and mark-up Other direct costs | Joint costs of coal extraction | Costs of coal mechanical processing | Mining damage Other costs |

Source: author's own elaboration

The cost of hard coal extraction estimated separately for each longwall from which the mineral was extracted should be used, among other things, to assess the efficiency of production processes and the efficiency of the wall, and to plan the long-term exploitation of the mineral. Unfortunately, in the present situation, these costs are in principle not calculated (apart from some specific studies).

From the viewpoint of the conducted research, an important factor that influences the way in which hard coal extraction costs are viewed and analysed is the fact that in mining operations there are clearly distinct phases of the extraction process related to coal exploitation. A single longwall (wall, or wider field of exploitation) lifecycle comprises such processes as preparation for exploitation, exploitation, and liquidation. Each of these phases requires different resources and, as a result, different cost levels. The conducted direct cost structure research¹ of an exemplary longwall, which takes these functioning phases into account, indicates that the most costly phase is the preparation for exploitation. About 67% of all direct costs for the studied longwall were attributed to this phase (Segeth-Boniecka, 2017, pp. 113–128). The presented considerations apply to the exemplary longwall. The structure of the abovementioned costs depends on individual features of particular longwalls, which may be very different. However, certain regularities concerning the prevalence of particular cost groups in total costs may be observed, as shown above.

The changeability of conditions described above results in the fact that there is no one predefined cost of coal extraction. The hard coal production (sourcing) cost is a highly variable amount dependent on many factors, mainly geological and coalmining. The geological and coalmining conditions of the deposit significantly influence the production size and the quality of the mineral and, consequently, the extraction profitability. Furthermore, coal mines have no influence on them and they can be subject only to very limited control.

Apart from the extraction cost, the second vital element which determines the economic effectiveness of the extractive enterprises is the hard coal price. One of the features characteristic and typical of this sector is a very limited impact on the selling price of the goods produced. Mining is also a unique industry because it is highly influenced by international conditions. This influence can be analysed in the context of production, export, import, and other factors which shape the coal price on global markets. Moreover, the factors with international origins which influence Polish coal mining include: coal sourcing costs, the amount of resources and their geographical location, transport costs and transport infrastructure (marine and land-based), and ecological conditioning, including regulations on both extraction and utilisation sides (Bąk, 2012, pp. 31–32). The abovementioned factors have an impact on the hard coal price which is dependent, *inter alia*, on trends on the global mineral resources markets, usually resulting from the level of supply and demand, but which are sometimes also subject to the effect of speculative activities of some investors. The price of hard coal dedicated by Polish mines for export is mainly influenced by the prices of coal in the ports of Western Europe, as the countries from this region are its main importers. Furthermore, the price is also dependent on foreign exchange rates, which influence export efficiency which may also turn out to be meaningful when the parity of the raw material price is being determined. The prices of alternative energy sources are also of considerable importance.

¹ Due to limitations resulting from the assumed account assignment systems, only these costs which explicitly refer to the exemplary longwall were taken into consideration.

Both the business cycle and the coal price resulting from it influence the determination of the extraction size, which substantially shapes the unitary extraction cost of one tonne of coal. A low extraction level may prolong the mine's existence but at the same time it may result in a high unitary coal extraction cost (Kowal, 2007, pp. 97–99). Extraction concentration, which describes the amount of extraction from a particular place in a particular time unit (a day, ten days, a month, a year) also has a significant impact on the economic effectiveness of coalmining production (Lisowski, 2001, pp. 203–204; 1960). It is a gauge of productivity of a specific extraction area: a longwall, a field of exploitation, or a level of extraction, depending on the level of the analyses. The increase of the extraction concentration implemented by means of extracting maximum amounts of the mineral from the lowest possible (but optimal in the given conditions) number of exploitation walls is connected with, among other things, decreasing the number of walls and simplifying the structure of opening-out headings and preparatory mine workings. As a result, it leads to the decrease of the unitary extraction cost. Each reduction in excessive production capabilities, as well as optimal simplification of the spatial model of rendering the deposit accessible, are very important from the viewpoint of the economic efficiency of a hard coal mine because creating and supporting underground workings, which are indispensable in the process of coal extraction, generates very high fixed costs and means there is smaller possibility of a flexible reaction to business cycle changes. Liquidation of unwanted workings, extraction concentration, and appropriately chosen solutions in the technological area of exploitation may significantly contribute to restraint of cost levels (Kowal, 2007, pp. 99–102).

Planning in mining enterprises is an extremely difficult, complex and multifaceted process that leads to decisions resulting in more serious consequences than in other production enterprises, also from a social viewpoint. One of the factors that makes the planning process in the discussed entities difficult and unique is the fact that task completion is very stretched over time. A characteristic feature of the industry described is the relatively prolonged (even a few years long) pre-production period, which includes: searching for a new deposit, its evaluation, as well as preparatory and facilitating works before coal extraction. The production (exploitation) period is also relatively long, which is why the planning process should encompass a period from ten or so years to several decades. A significant problem in long-term planning is the limited lifespan of mines and the necessity to search for new deposits. The planning of mining operations is also difficult and highly complicated due to the changeable geological and coalmining conditions, as well as the considerable diversity of possible technical solutions, each of which may be applied to different scenarios of vicinity development and results in a different production effect, capital expenditure, time period etc. The abovementioned factors mean that a properly conducted planning process in an extractive enterprise should (Lisowski, 2001, p. 91; Bąk, 2012, pp. 5–12):

- provide for current market conditions (inter alia, hard coal demand, its price, the possibility of obtaining it, as well as the cost of investment loans, the price of capital assets etc.);

- secure operations in the development area and production preparation, achieving the goals established in the plan;
- provide for the need to use geological resources in accordance with the economy of sustainable development
- provide for the conducting of operations in many territorially distinct places, and, as a result, deal with specific geological and coalmining processing conditions;
- provide for different, naturally distinguishing phases of the hard coal exploitation cycle in particular places (preparation for exploitation, extraction, and liquidation)
- secure appropriate human capital;
- enable optimal usage of work time;
- minimize threats resulting from the works in progress, including the general security on the surface level;
- minimize the adverse influence of both exploitation on the surface and mining on the natural environment;
- strive for achieving results which make it possible for the enterprise to function stably in the conditions of the market economy;
- enable multi-variant predictions to be made that facilitate the choice of the most beneficial solution, including risk level.

The above considerations concerning the character of a hard coal mine activity and the determinants of its economic effectiveness point to the importance and prominence of prospective information in the hard coal mine management, and they show the need to look for modern tools from the field of cost accounting in the process of planning operations in such entities. In terms of strategic mine management (including the phase of mine construction), the assessment of deposit quality, the possibilities of its sourcing, the estimated cost of its extraction, and its market value all play a decisive role. They are indispensable to assess the effectiveness of operations and to reach decisions concerning the exploitation of a specific part of the deposit. The degree of recognition of coalfields determines, among others, the choice of extraction technology, which influences the costs of coal production. The prognostic assessment of the economic effectiveness of the deposit predestines the deposit's attractiveness in a given period and under given circumstances (current price levels, technical advancement etc.). The level of coal extraction cost and its price determine decisions to reach for more or less profitable parts of the deposit in order to adjust the mine's production to the needs of the market and the economic situation in a flexible way (Lisowski, 2001, pp. 53–55).

The performed analyses indicate a very significant role of information about costs in the process of planning. It seems that the economic planning process does not hold a proper rank in the mining industry because in the planning specifications, especially the long-term ones, and the technical approach is prevalent (Bąk, 2012, pp. 29–50). The information on costs in the *ex ante* approach is predominantly created in section of costs by type and in structure of costs by responsibility centres. It is, however, considered insufficient due to the distinctive character of the activity done in hard coal mines.

2. The kernel of target costing concept

The target costing concept was developed in Japan in around 1960 (Tanaka, 1993, pp. 4–11; Tani et al., 1994, pp. 67–81; Feil et al., 2004, pp. 10–19), and its principles were described in the literature at the end of the 1980s. It is diversely defined (Masztalerz, 2006, pp. 129–134). The analysis of target costing definitions available in the literature shows that authors pay attention to multifarious aspects of this method. Target costing is most frequently understood as a strategic tool of cost management (Szychta, 2003, p. 66; Sakurai, 1989, p. 386), used mainly in unitary calculations of production costs, which serves cost reduction (Moden, Hamada, 1991, p. 17; Kato, 1993, pp. 33–47), aiming to achieve a specific, predefined profitability level (Prewysz-Kwinto, 2010, pp. 41–45; Masztalerz, 2006, pp. 129–134; Tanaka, 1997, pp. 4–5). Target costing is a tool of cost management and its main aim is to rationalize the cost level, including its reduction within the framework of a product's lifecycle. By influencing cost shaping, target costing plays an important role in the planning of entity operations.

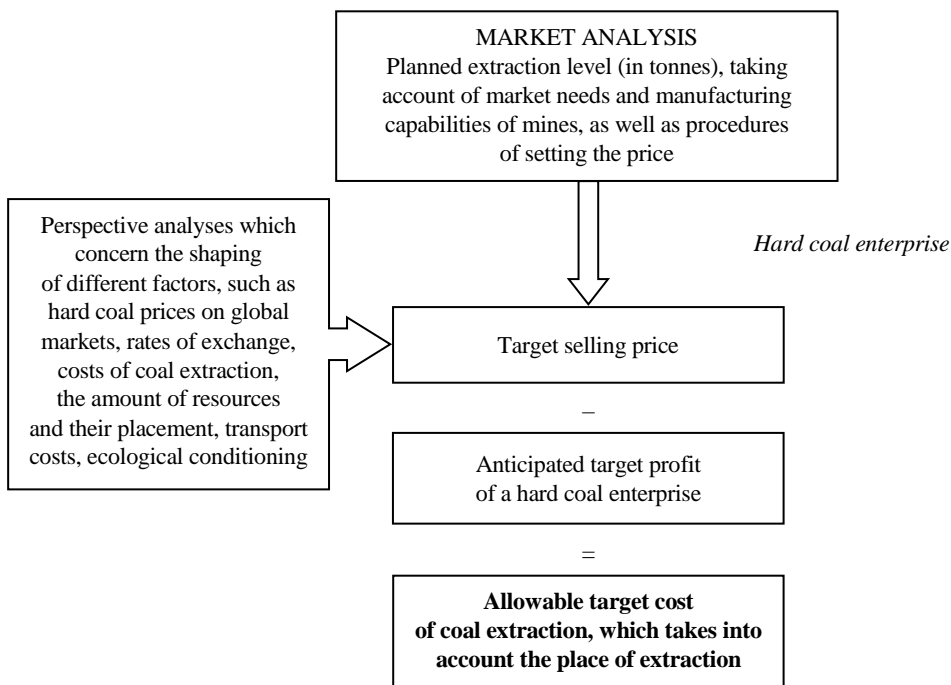
Undoubtedly, the development of target costing was strongly influenced by the increase of importance of the pre-production phase, and especially costs generated by it (Tanaka 1997, pp. 4–11). It should be underlined that target costing is used in the process of planning, especially in the product development phase, which is very significant considering the fact that, according to research, even 80-90% of goods' manufacturing cost is decided in this phase (Prewysz-Kwinto, 2010, p. 44, as cited in: Cooper, Slagmulder, 1997, p. 73). Big competition on the market, the increase of demands from increasingly conscious customers, the development of technology, and technological progress are listed as the next factors which influenced the development of the discussed target costing concept (Kato, 1993, pp. 33–47).

In target costing methodology, the selling price and the profit margin are used to determine the allowable target cost of product manufacture. The task of the managers is to set the target price, which is the price achievable on the market with consideration of various conditions, such as customer requirements, product demand, prices offered by the competition etc. (Szychta, 1997, pp. 73–75). The next stage is the process of setting the target profit, which allows the company to achieve the predefined and desirable level of profitability. The difference between the target price and the target profit constitutes the value of the allowable target cost. At the next stage, this cost will be transformed into the target cost achievable by the entity at the planning stage.

Taking the abovementioned target costing procedure into consideration, and striving for functioning efficiency of hard coal extractive enterprises, it is significant to take account of the selling price, which is imposed by the market in a specific way and which should be accepted by the coal recipients. Planning sales volume is related, on the one hand, to recognising recipients' needs, the price level, and consideration of long-term signed contracts, and, on the other hand, to the manufacturing capabilities of particular hard coal mines which constitute a hard coal extractive enterprise. Within one hard coal enterprise there is a division of planned production among particular mines; consequently,

within the mines, there is a division among particular extraction units which carry out the exploitation in territorially designated places. The use of the target costing concept requires the assumption of a certain profit level resulting from coal sales (with consideration on the amount of hard coal sold), which guarantees that the target profit will be achieved. The estimated profit level should be set based on the analysis of market factors which influence the price of particular coal quality possible to be extracted from a designated exploitative site. It is the first phase of target costing, the goal of which is to set the allowable target cost with consideration of planned extraction size and hard coal sales, as well as target selling price and target profit (Figure 2).

Figure 2. Stages of determining allowable target cost in a hard coal enterprise



Source: author's own elaboration

To achieve clarity of the elaboration, the abovementioned analyses were carried out at the level of gross result (profit/loss) on sales. That is why the amount of target profit should be set at this level, in order to cover the estimated selling, general, and administrative expenses.

Due to the limited influence on the hard coal selling price, the level of costs is a significant factor determining the economic effectiveness of operations. In target costing, an important question is asked: what should the hard coal extraction cost in particular mines be, taking its particular exploitation sites into consideration, so that a hard coal enterprise could achieve the target profit in the whole functioning cycle of particular

exploitation sites (longwalls, broader fields of exploitation). The coal extraction cost, which will be considered appropriate as far as its price is concerned, is called the allowable target cost. The allowable target cost is the highest possible unitary extraction cost per one tonne of hard coal, considering the place of extraction, which must not be exceeded in order to achieve the predefined profit.

The second stage of target costing consists in setting the target cost, which takes account of, *inter alia*, financial possibilities and production capabilities of mines (natural resources, capabilities restricted by efficiency etc.). In order to set the target cost, the allowable target cost is compared to the current cost (also called a drifting cost; Szycha, 2003, p. 75), which is the cost at which coal could be extracted, considering current technological, organisational, economic, and other factors, without any changes being applied. The difference between the allowable target cost and the current cost is the amount of desirable cost reduction, which should be achieved by means of introducing particular changes in the process of coal exploitation and effective, long-term cost managing (Nowak, Wierziński, 2010, p. 138). Cost reduction may be achieved through, among other things, precise cost analysis at its planning stage, then monitoring in different phases of the longwall lifecycle (field of exploitation), better organisation, and motivation of all centres of cost responsibility taking part in the coal extraction process.

The abovementioned level of cost reduction consists of two parts: the target cost reduction objective (achievable) and the strategic cost reduction challenge (unachievable) in the planning phase. The unachievable part of cost reduction should constitute the strategic aim of an enterprise (Cooper, Slagmulder, pp. 109–110 as cited in: Prewysz-Kwinto, 2010, p. 84). It is possible to be obtained in the long term as a result of a continuous improvement process. A significant role in striving to achieve a desirable level of cost reduction is played by the integration of target costing and kaizen costing – the system of cost reduction (Feil et al., 2004, pp. 10–19; Moden, Hamada, 1991, pp. 16–34; Sobańska, 2003, p. 391; Nowak, 2003, p. 231). The system of cost reduction means systematically searching for and implementing improvements in technology and production organisation, increasing the level of knowledge and qualifications of employees in order to constantly lower the hard coal extraction cost, constantly refining processes carried out in the mine, as well as improving production process, including the pursuit to increase the amount of production (extraction concentration).

Therefore, target cost constitutes the difference between the current cost and the so called achievable part of cost reduction. Considering the character of mining operations and the importance of mining knowledge, the mixed method is regarded as the appropriate one to set the level of the target cost (Sakurai, 1989, p. 43; Szycha, 1997, p. 77). This method is based on setting the target cost by the mining enterprise management after consulting the appropriate employees of the coal mine technical extraction units on cost estimation. Emphasising bottom-up budgeting is necessary due to the high level of complexity of the hard coal extraction process, as well as big diversity of geological and coalmining conditions. Hard coal mine cost planning should take into account the

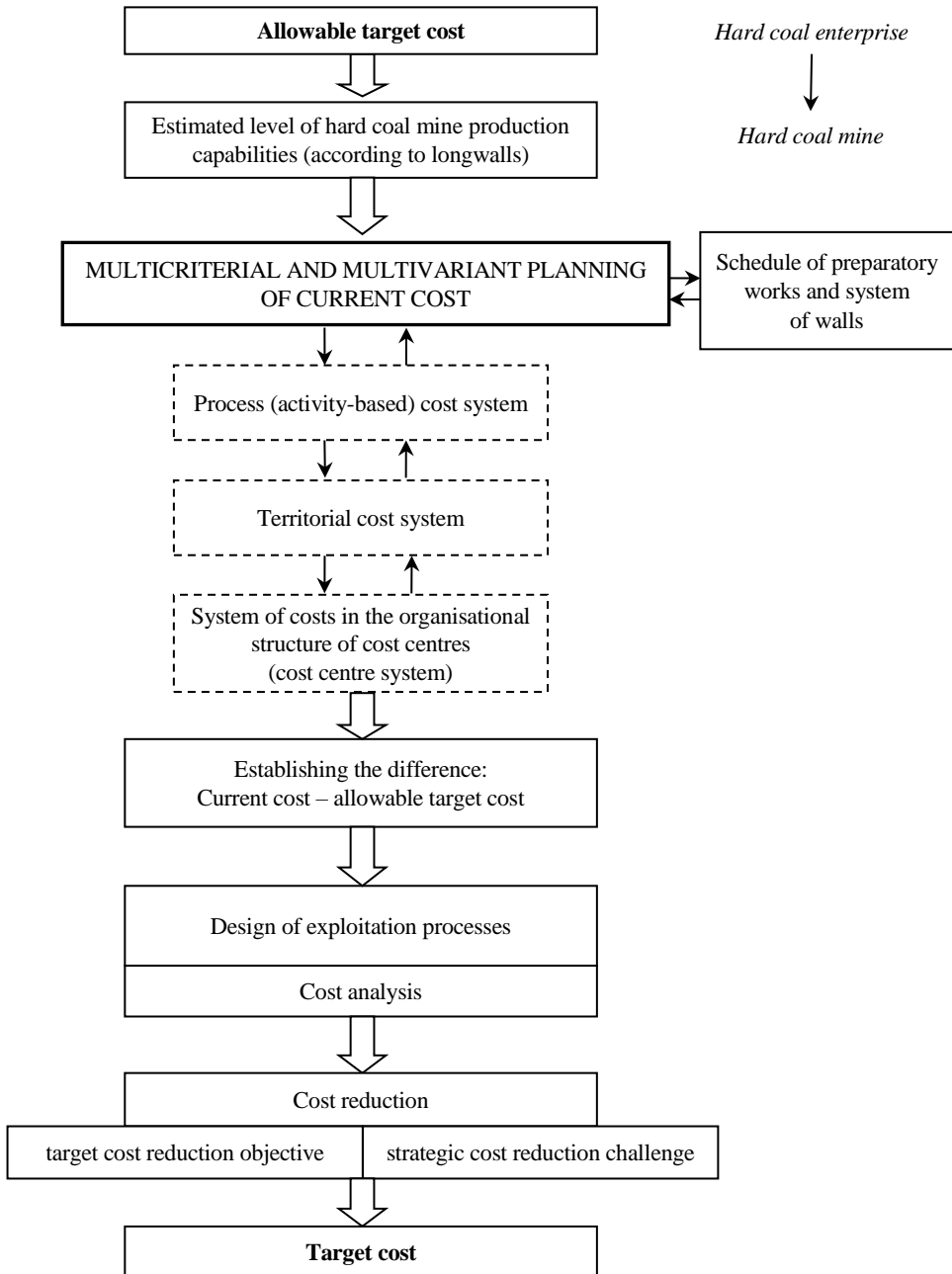
process of coal extraction from a particular wall (longwall), which is characterised by individual extraction parameters. Thereupon, employees with appropriate knowledge and experience related to mining production should be engaged to a larger extent (Brzychczy, 2013). Considering the territorial positioning of planned processes and the characteristic features resulting from it determines the period of carrying out particular processes, defines what processes should be planned and which resources are sequentially needed for their execution, and, as a result, leads to the increase of planning reality.

The character of hard coal mine operations, including the simultaneous execution of extraction processes in many exploitation sites, requires concurrent cost planning in three basic management areas (cost systems): the area of activities carried out (activity-based cost system), the area of cost centres, and the area of territorially isolated location sites (territorial cost system). A cross-sectional look at coal extraction costs allows the necessary information about the operating cost in a hard coal enterprise to be obtained. Each of the three cost systems comprises the whole operational activity of the mine. Cost systems are closely interrelated. Workplaces under ground and on the mine's surface together with facilities and equipment constitute a specific space in which particular activities are executed, which is related to a particular responsibility. The units carrying out the activities in different locations are concentrated within cost centres. Moreover, in hard coal mining it is not only the financial data, but also the non-financial information which is significant in the course of optimising processes and operations. It is necessary to relate activities with information concerning geological and coalmining conditions. Multi-structural cost planning aims to design the coal extraction process in a multifaceted way, with consideration of the whole longwall lifecycle (broader field of exploitation), so as not to exceed the pre-defined cost level (Figure 3).

In the process of cost planning in an activity-based system it is necessary to answer what cost level will be caused by the activities. This requires cost planning in the section of correctly isolated processes and activities, including the kind of resources used (human resources, machines and devices, buildings, materials, external services, etc.) as well as other procedures resulting from the introduction of the target costing concept in the procedural system.

The cost system in the organisational structure of responsibility centres points to the responsibility for the activities, including the cost level. The appropriate correlation of isolated processes (activities) with centres responsible for their implementation is of significant importance. The suggested procedural cost structure should constitute the basis for creating centres of responsibility for costs according to the procedural approach. Considering the distinctive character of mining, it is necessary to additionally take into account the geographical (spatial) approach in the process of distinguishing centres of responsibility for costs, because mining activities are carried out simultaneously in territorially different and separated sites. Introducing a procedural approach means that a specific process (activity), which includes related activities (groups of actions) constituting phases of the whole activity process, become the centre of responsibility for costs.

Figure 3. Stages of verification of target cost in a hard coal mine with the consideration of cross-sectional cost information



Source: author’s own elaboration (on account of the limited scope of applied planning procedures in the researched entity, the presented model is based on suggested cost structures)

The territorial cost system should answer the question how the geological and coal-mining conditions characteristic of a particular site will influence the level of planned costs. The main aim of applying cost identification in the described system is their observation in specific geological and coalmining conditions. This observation is indispensable in the planning and control of production efficiency.

Multi-criterial and multi-variant cost analyses make it possible to predict hard coal extraction costs from different longwalls, fields of exploitations, deposits, and with the use of various production facilities. The above view and cost estimation would make it possible to provide reliable data for broadly defined cost planning needs and their rationalisation, including reduction and later control. It should be underlined that in the planning process a significant role is played by the abovementioned precise procedures of calculating the hard coal production (sourcing) cost, including the determination of direct and indirect costs of a longwall. Their correct recognition would make it possible to improve the planning process through a more appropriate connection of the cost with the production it actually refers to.

Conclusion

Planning constitutes the basis for other managerial functions, the proper organisation of entity activities, effective motivation and adequate control. Planning is a clear and possibly precise setting of goals, and includes the activities and means of execution resulting from them (Komorowski, 2001, p. 13). The application of different systems and tools in cost management make it possible for an entity to attain better cost recognition and rationalisation, it may influence its reduction and, as a result, it makes it possible to achieve a desirable level of profitability. One of the tools streamlining the process of cost planning is the concept of target costing.

The basic objective of planning in a hard coal enterprise is to define the sequence and manner of deposit exploitation and the amount of extraction necessary for a profitable sale. Simultaneously, planning strives for cost rationalisation, so as to ensure the required level of security of operations and guarantee positive sales result, especially in the long run (Bąk, 2012, p. 32). Key parameters in planning of hard coal mine operations are the size of extraction and its costs, the main determinants of the economic efficiency of hard coal mine activity.

The conducted research showed the possibility of applying target costing in the planning of hard coal mine extraction, considering the specific character of the functioning of hard coal enterprises. The use of the target costing concept, its integration with other tools of cost management, such as kaizen costing, and adjusting it to the specific conditions in which hard coal enterprises operate, would support the management process of hard coal extraction cost. It would also contribute to planning more realistic budgets and influence the rationalisation of cost levels by striving to achieve profits long-term.

This article is an introduction to further and more detailed analyses, which will be the subject of further research of the author.

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