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HORIZONTAL INTEGRATION IN THE DEVELOPMENT STRATEGY OF MINING COMPANIES

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Abstract: Integration strategy is one option in the development of mining companies and is implemented through a connection of either processes or economic entities which operate or may operate separately. Usually this strategy is carried out by companies that occupy a very strong competitive position. Considering its direction, it may be horizontal or vertical. Horizontal integration strategy stems from a desire to increase market share by an entrepreneur or create a new company based on common know-how and combined operational processes. It can be realized in an external dimension through a merger or takeover, as well as in the internal dimension based on its own resources. The external dimension is based on capital or contractual integration of a company with external economic entities performing related or conglomerate activity. The targets of such integration have a resource, a market effectiveness, or a competence nature. In the case of mining companies, it covers all important activity areas, including geology, mining, processing, environmental protection, and waste management, and is carried out with due diligence. In the internal dimension, the strategy of horizontal integration consists in consolidating the strategic targets of all business units around the company's (corporation's) targets.

The authors focused on two trends most relevant to pursuing a horizontal integration strategy, including increasing the company's flexibility and undertaking joint activities. Flexibility consists in the potential ability of the company to adapt quickly to changed environment conditions. Joint activity includes co-operation of its respective units in terms of products, markets, and functions; its implementation should be preceded by a detailed analysis of the company's competences.

Keywords: *mining, development strategy, horizontal integration, economics*

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INTRODUCTION

One of the most commonly used options of company development is a strategy of integration, i.e. a fusion of different business entities operating or capable of operating separately for the production of market products, which results from the possibility of implementing common goals, processes, or tasks. Taking into account the above, it should be noted that integration can have a functional character regarding the processes and /or structures concerning the economic entities (Fig. 1). Because of their directions, we can distinguish horizontal and vertical integration. The strategy of horizontal integration concerns, in the external sphere, the relations of companies or their groupings with economic entities performing similar activity or performing unrelated activity (conglomerates), while in the internal sphere it concerns the strategic business units (SJB) in the scope of their efficiency resulting from various forms of activity. A horizontal strategy targeted in such a way is clearly separate from the area of vertical strategy concerning purchasers and suppliers in the same chain of the company's value (Kudełko, 2012).

A characteristic feature of horizontal integration strategy in the external sphere is usually the integration of business entities, while the internal sphere consolidates strategic business entities and mutualisation of activity. Relations in the external sphere consist of capital integration in the form of mergers and takeovers or in contractual integration e.g. in the form of strategic alliances. The integration targets are to be situated in the areas of resources, market, efficiency, and competence. Such areas also cover the internal goals pursued by consolidation and the integration of activities within the scope of the functions and processes of the company. The effects of economic entities integrating and the internal consolidation of strategic business units may arise from:

- economy of scale allowing increased output, and the treatment and processing of minerals by increasing their resource base
- economy of scope allowing for product diversification
- economy of experience consisting in adoption of new, key competences, for technology transfer, provision of know-how, and quality improvement
- provision of new market segments
- differences in prices of production factors, exchange rates, and tax systems in the case of global activities
- reduction of costs by mutualisation of functions and processes.

Each case of integration should be examined separately with due diligence (due diligence analysis), using the knowledge and experience of specialists, taking into account the essential areas of a company’s functioning.

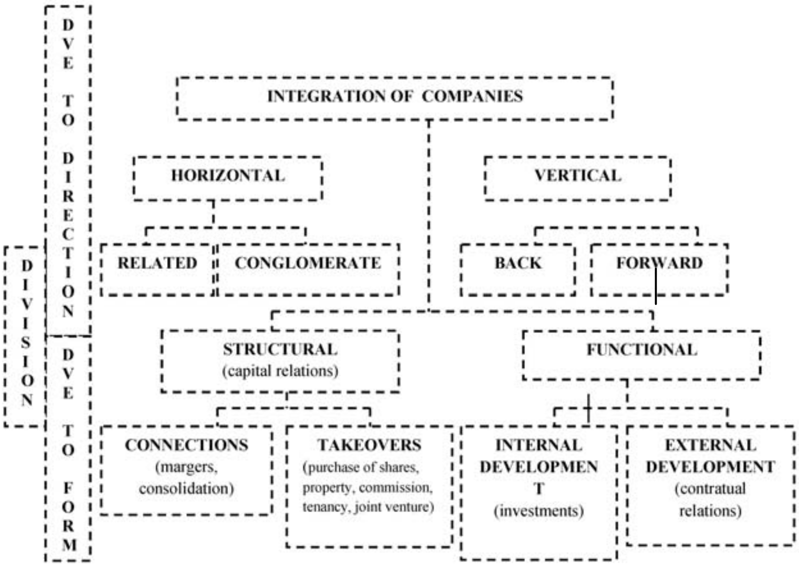

Fig. 1. Integration options for companies *(own work)*

HORIZONTAL INTEGRATION OF ECONOMIC ENTITIES

The strategy of horizontal integration of mining companies consists in integrating economic entities conducting related activity or conglomerate activity, excluding the entities from the economic chain of the company (purchasers or suppliers). Horizontal strategy can be characterized by the following dimensions:

- directions of horizontal integration
- targets of integration
- intensity and forms of integration
- profitability of integration.

Taking into account the direction, one can distinguish related horizontal integration or conglomerate integration. Horizontal integration is applied by companies with large financial surpluses. The main reason for related integration is the use of its own competences. Related integration occurs when a company expands its activities in sectors related to the product, the market, and technology, where it can utilize its resources and skills. Integration has a related character, if at least one of the following features appears:

- the new product (or service) is sold in similar markets where the company had previously operated and/or by usage of similar distribution systems
- the new product is produced using similar technologies
- the new product is associated with a similar research and development base.

An entity simply belonging to the same sector or industry branch is not a sufficient reason to define such entities as related. For example, copper ore and brown coal mines are not related, while copper ore mines and entities conducting the construction of underground tunnels influenced by quicksand hazard can be treated as related. The advantages of related integration are seen in (Butra et al, 2010):

- the synergic effects resulting e.g. from better use of resources
- complementary effects resulting, e.g. from the complexity of a commercial offer
- competence effects consisting in the use of indigenous competences of the company and their possible increase
- revitalization effects that give new impetus to a company's activity.

The disadvantages of related integration may consist in the fact that reduction in the growth of a sector in which the company had previously been active may be also accompanied by a fall in the related entities.

Conglomerate integration consists in expansion of a company's activities to sectors associated with other technologies, products, and markets.

The advantages of conglomerate integration are perceived in:

- the growth of the development potential of a company operating in different markets
- financial synergy resulting from investment of capital in fields characterized by a higher than average rate of return and the common policies of the conglomerate.

The disadvantages of conglomerate integration are related to:

- the possibility of a company's specialization and identity disintegrating
- the necessity to recognise new sectors, overcoming entry barriers, and elaborating new competences.

It is believed that a company striving to improve profitability should use related integration, while a company aiming at growth is advised to diversify conglomerates, through which means the subjective probability of incurring losses at conglomerate integration is rather higher. Related integration, and more often conglomerate integration, is usually accompanied by diversification, but this is not the rule, because in exceptional cases one may use only selected competencies of the integrated product. Another important dimension characterizing horizontal integration is the various targets of integration, which are systematized because of their hierarchy and type.

Target definition was given by Krzyzanowski L.: *"The target of the company is an objectively and subjectively determined future desired state or possible outcome of the company's activity, intended to be achieved within a deadline or time period set in a time interval covered by a multiannual or short-term action plan"* (Krzyzanowski, 1993).

Because of their importance and validity, the following classification of targets has been adopted (Fig. 2):

1. *Main target*, which is normally determined by an increase of the company's value and generation of income.

2. *Strategic targets*, that concern the whole company; also called the targets of the first order.
3. *Tactical targets*, that can sometimes affect the entire company, but usually concern strategic business units or segments of the company. Strategic segments in the Basic Technological Course (PCT) of a mining company can be its mines, processing plants, or steel works.
4. *Operational targets*, that relate to a company'sfunctions (logistics, production) and which are implemented by functional units.

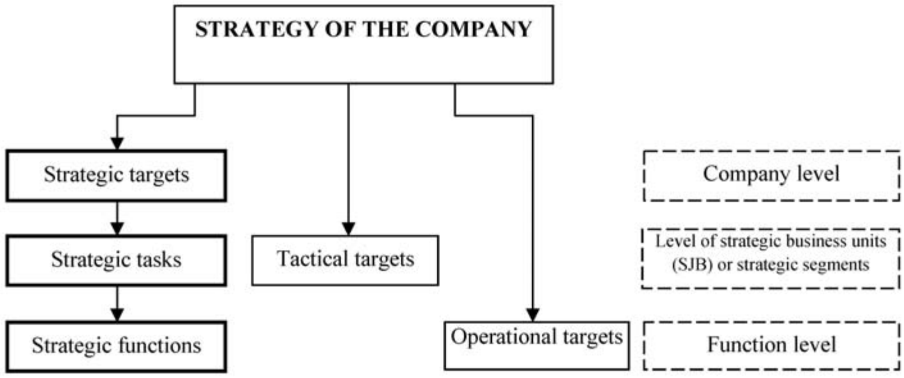

Fig. 2. Company's strategy and hierarchy of targets *(own work)*

In terms of types we can distinguish four directions of targets (Butra et.al., 2010).

The *resource direction* in the case of mining companies concerns the possession of licenses for exploration of minerals, prospecting, and the concession for usage of deposits with various degrees of development. The attractiveness of deposits is determined by geological, mining, explorative, and processing characteristics. An extremely important dimension is the location of the deposits and local technical, economic, social, and demographic infrastructure, as well as the availability of production factors.

Geological and mining assets, in particular the resources of mineral deposits, are important for mining and raw materials companies (Kudełko & Wirth, 2015). Taking into account the integration of the above mentioned companies, a significant factor is the value of the deposits covered by possessed concessions, depending on:

- location and related technical, economic, political, and social aspects, etc.
- geologic and mining characteristics, protection of resources, and environmental protection
- recognition of the deposit in appropriate categories
- degree of deposit development
- value of resources.

The *market direction* in horizontal strategy relates to competitors and distributors (buyers and suppliers are situated in the vertical dimension). Market oriented integration in the horizontal dimension should have a global character and concern new markets or market segments, market offer diversification, complementarity of services, efficient distribution channels, etc.

Efficiency direction usually comprises the integration with companies of weak financial condition. The effects of such integration are seen in the sphere of material reserves and in the management sphere, as well as in tax savings. Very important in efficiency direction is foreign investment, including situations in which (Buckley, 2002):

- there is a difference between project flows and the flows available to the parent company
- exchange rates will be changeable
- there are tax differences in the country of the investor and the country of investment
- license fees and fees for management play an important role
- there is the impossibility of net cash flow from the project into the parent company.

Competence direction means integration with other entities in order to gain new abilities including (Tubielewicz, 2004):

- a distinctive level; competitive companies cannot easily copy a given competence and thus it gives an advantage on the market and enables an above-average level of profitability
- a key level; competence is widespread among direct competitors but essential to keeping up in the sector
- a routine level; competence is typical for most of the companies and connected with activities that need to be performed.

The practical dimension of a company's competence – in general – is determined by three components:

1. the scope of the specialised knowledge of the staff and the skills gained in practice.
2. the types of work in which the company has rich experience and equipment.
3. the types of problems effectively solved in recent years.

Competences are verified in practice by comparison with competitors in the global scope.

Resources and skills create key competences when their connection (Stonehouse et al., 2001):

- increases the product value perceived by the consumer (competitive advantage)
- is better, i.e. adds greater value than when it happens in the case of competitors
- is clearly better than the core competences of other organizations
- is complex, difficult to follow, and long lasting, – thus preventing copying and taking over by competitors

- is unique – unavailable to competitors
- is not substitutive – it cannot be replaced by other combinations of resources and skills
- is adjustable – can be used to obtain a competitive advantage in other markets
- is adaptable – easy for management and adaptation.

The source of competence is knowledge: know-what – knowledge of facts (what); know-why – the basics of knowledge (why); know-how – the capability of certain activities (how); know-who – possession of knowledge (who).

Because of the intensity and forms of integration of business entities, we can distinguish two cases: capital integration and contractual integration (Johnson, 2000). Capital integration is carried out mainly in the form of mergers, takeovers, and joint ventures, while typical examples of contractual integration are strategic alliances.

A merger can be performed in one of two ways:

1. *inco*rporative, based on the fact that one company takes over the property of another or many business companies, and the existing owners of the companies receive an appropriate amount of shares/stock, at the same time creating a legal personality.
2. *consolidative*, based on the fact that the merging parties form a new company under a new name, and the owners of existing companies take over appropriate stocks or shares.

Takeover is a transaction, in which one of the companies – usually bigger – buys the shares of the other party in order to fully integrate it into its own structure. It forms a single entity under the name of a bigger one. Takeover can have a friendly or hostile nature, taking into account the legal state governing such matters in the countries concerned.

Joint-venture is the connection of a part of the assets of two or more companies in order to accomplish a certain enterprise (e.g. technological, marketing, etc.) under a new name, by which the companies constituting the joint venture still operate under their company names. Joint ventures are especially recommended at the supranational level.

Contractual integration occurs in the form of strategic alliances, venture capital (minority shares in high-risk enterprises), license agreements, etc. A typical example of contractual integration is the strategic alliance.

Strategic alliances are agreements between independent companies for implementation of a defined target; they are concluded on the basis of a mutual benefit partnership, preserving the organizational separation of the allied parties. The basic microeconomic reasons to create alliances are the following targets:

- resource targets (e.g. an increase of financial resources, acquisition of raw materials, etc.)
- market targets (e.g. an increase of participation in a market, overcoming barriers to entering local markets, entering into other sectors, etc.)

- efficiency targets (e.g. obtaining the effects of the economy of scale, utilization of the effect of comparative costs, etc.)
- competence targets (e.g. obtaining access to new technologies, acquisition of new competencies in the chain of values, e.g. distribution, etc.).

Taking into account the market relations between partners, the following can be distinguished (Butra et al., 2010):

- alliances between competitors
- alliances between companies that are not competitors.

Alliances between competitors may take the form of:

- functional alliance
- additive alliance.

Functional alliance consists in integrating competitors within the scope of specific functions, such as research and development, marketing, etc., while each partner produces its own product.

Additive alliance consists in integrating competitors in order to produce a single product by the alliance partners, who share the task between themselves in accordance with their competencies. The target of such an alliance is to achieve synergy effects and the economy of scale.

Alliances between non-competitive companies (cross-sector agreements) are called *complementary alliances*. Alliance partners are companies producing different products.

If we are to deal with many alliances, then they form a network called special purpose clusters, especially in a company's cooperation with the region in which it operates. In assessing economic integration we use standard measures such as value added, payback periods, net present value, etc. It should be remembered, that the economic effect is estimated based on projecting a company's state after integration and the states of sub-entities before integration. Generally, it can be assumed that the value of an integrated company is the sum of the merging companies; therefore, the economic effect of integration is described by the formula (Jajuga & Jajuga, 1998):

$$W_{\text{int}} = W_1 + W_2 \tag{1}$$

where: W_{int} – value of the integrated company, PLN
W_1 – value of the company implementing integration, PLN
W_2 – value of the company subject to integration, PLN.

Risk measured by standard deviation of these values can be described by the following formula:

$$\sigma_{\text{int}} = \sqrt{W_1^2 \sigma_1^2 + W_2 \sigma_2^2 + 2W_1 W_2 \cdot \sigma_1 \sigma_2 \cdot wk_{12}} \tag{2}$$

where: $\sigma_1, \sigma_2 -$ the standard deviation of the companies' values,
wk_{12} – the coefficient of correlation between the companies' values,

In the case of valuation of synergistic effects, the following formula is used (Lewandowski, 1998):

$$NAV = [V_{AB} - (V_A + V_B)] - (P + E) \tag{3}$$

where: NAV – net value of the takeover, PLN
V_{AB} – value of the integrated company, PLN
V_A – value of company A, PLN
V_B – value of company B, PLN
P – bonus paid for company B, PLN
E – transaction costs of integration, PLN.

If $NAV > 0$ it means that the entire consolidation process may generate a positive value.

In assessing integration we use the so-called *due diligence* method (due diligence analysis). It covers the most important business activity areas, which include finance, the legal system, operational and managerial system, natural resources, human resources, organizational culture, and environmental protection (Table 1). In most cases, the scope of analysis and its details are established between the party ordering the analysis and the party performing it. In the case of entities participating in *due diligence* analysis, the key role is played by the *investment bank* which is a coordinator of the whole process. The bank's involvement goes far beyond the scope of organization and coordination of the whole analysis, since upon the request of the taking-over party, it can organize the financing of the transaction.

Tab. 1. Entities participating in due diligence analysis of mining company

Consulting agencies *(audit)*	Legal offices	Advisory agencies *(strategy)*	Advisory agencies (*human resources)*	Research institutes	Research institutes, competent persons
– financial, – economic – of possessed assets	– legal – concessionary – areas of transaction risk	– operational – managerial – in the scope of strategy	– in the scope of human resources – connected with the culture of the organisation – of possessed competences	– in the scope of environmental protection – ecology	– geological and mining assets – size of resources – value of deposits – applied mining and processing technologies

The complexity of the analysis resulting from the specific character of a mining company causes the fact that the scope of due diligence analysis by far exceeds the capabilities of a single entity. This fact creates the necessity to involve many different subjects specialized within a given area of analysis. The mentioned situation may occur for example in studies over environmental protection issues. This demands the involvement of relevant research institutions or individual experts who deal with specific problems in mining industry.

HORIZONTAL INTEGRATION OF STRATEGIC BUSINESS UNITS (SJB)

The internal dimension of horizontal strategy is related to diversified companies and consists in the integration of strategic business units' activity around the targets of a company (corporation). The formal basis for internal horizontal strategy is a balanced distribution of decision-making powers between the headquarters (the company's management) and the strategic business units (SJBs) composing the group. Strategic units tend to autonomize their activities while, on the other hand, it is required to centralize decisions, particularly concerning:

- determination of strategic targets and the directions to achieve them
- the structure of the group and determination of the strategic business units' (SJB) framework of activity
- allocation of resources
- personal decisions.

Internal horizontal strategy should calculate in both directions (Lis et al., 1994):

- increasing the internal and external factors of a company's flexibility
- analysis of competences in the field of functions performed by the company and mutualisation of activities .

Among *the external factors of flexibility* of essential meaning are those which are related to the functioning of market channels. These are mainly the ease of access to the customer – identification of demand, efficient information and transport infrastructure, and the complexity and spatial structure of supply and distribution channels. No less important are factors related to legal and tax regulations, local customs, and commercial law, as well as insurance and tax systems. In the longer time interval, external flexibility is stimulated by the availability of modern technologies and the ability to pursue cooperative relations with attractive suppliers, while it may be limited by conditions resulting from the political environment (internal and international) and related trade and customs barriers.

The *internal factors of flexibility* of companies are related to the material side of their production processes. These primarily result from the characteristics of the means of production: the technology of the machinery and production equipment, transport and warehousing infrastructure, spatial IT technology structure, and the means of connection between these appliances, as well as the assortment of products and services and the degree of standardization of products and their components.

The second direction of horizontal strategy is mutualisation of some activities in the scope of products, markets, and functions. Mutualisation of activities in the scope of products may involve:

- offer of complementary products
- cooperation in the field of enrichment of products with new features
- production of a new, common product.

Mutualisation of activities in the scope of the market may involve:

- mutual recommendation of a partner's products for its own customers
- a complex offer for buyers
- exchange of products between buyer and seller
- use of common channels of distribution.

Mutualisation of activities in the scope of functions requires analysis of a company's competences and the competences of its components (strategic business units - SJB). In such analysis the answers to the following questions are helpful (Trotsky, 2001 & 2004.):

- which company functions are implemented efficiently and effectively within its structure?
- which of the company's functions can be implemented more effectively and efficiently outside the structure of the company?
- which of the company's functions carried on outside its structure can be implemented more efficiently and effectively within its structure?

The answers to these questions lead to identification of different variants of the restructuring enterprises (Fig. 4):

- partnering, i.e. maintaining of functions in the structure of the company
- outsourcing, i.e. separation of functions from the structure of the company
- insourcing, i.e. inclusion of the function into the company structure.

Necessary control of implementation of functions			
	intensive	Maintaining of function in the structure of the company (partnering)	Maintaining of function in the structure of the company (partnering) or inclusion of function performed outside the company into its structure (insourcing)
	weak	Separation of function from the structure of the company and its transfer for implementation to independent market partner (contractual outsourcing)	Separation of function from the structure of the company in a form of subordinate company (capital outsourcing)

Fig. 4. Variants of restructuring enterprises related to optimization of the scope of company's functions

An example of large-scale outsourcing can be the transport of materials to the mine. This form of outsourcing has become "fashionable" in the mining industry, but often without observing work safety regulations and without the required competences of contractors, which can result in tragic consequences.

A more important role in the mining industry is played by the mutualisation of activities within the frames of competences (Porter, 2006). To some extent they may concern the technology of works, e.g.liquidation of mining pillars, restructuring of transport, common preparation plants, etc. To a greater extent, mutualisation of activities may relate to research and marketing, logistics, quality, etc. Any decision concerning the mutualisation of activities requires detailed analysis in the aspect of mutual benefits and losses and also depends on the identity and culture of the company.

An interesting example of horizontal integration is the creation of BHP Billiton on the basis of two independent mining companies.

When, at the end of the 19th century, deposits of lead, zinc, and silver ores were discovered in New South Wales, Broken Hill Proprietary Company (BHP) debuted on the local stock market. In a few years it became one of the largest mining companies in Australia (GW, 2-3 May 2015). Silver prices at the beginning of the 20th century were falling, so BHP entered the steel market. Newcastle became a centre of steel industry. The city had two advantages; it was situated near the coal mines and was linked with Sydney by railway line. BHP began to buy licenses for mining in Australia, South Africa, and both Americas. Coal became one of the main products of the company.

The history of the Billiton Company also dates back to the 19th century. It started from exploration of tin and lead ores on Billiton Island in the former Dutch East Indies (Indonesia).

In 2001, BHP merged with Billiton. This is how the world's biggest corporation in the industry of raw materials was created. It now employs 23.8 thousand employees in 23 countries. Apart from coal, it is involved in oil, natural gas, potassium, copper, silver, iron ore, aluminium, magnesium, titanium, nickel, and diamonds. Last year, it grossed $ 13.8 billion.

CONCLUSIONS

One of the options for a company's development is a strategy of horizontal integration concerning two perspectives: external and internal. The external perspective refers to integration of the company with separate economic entities performing related or non-related activities, excluding the entities located vertically in the value chain of the company (suppliers and customers). It has a capital or contractual nature and its targets are situated in the following areas: resources, market, efficiency, and competence. Capital integration is mainly performed in the form of mergers, takeovers, and joint ventures, while a typical example of contractual integration are strategic alliances.

In this article the authors pointed out the fact that in the case of mining companies the most important are resource targets related to access to new sources of raw materials, which is essential to extend the company’s existence or to increase the scale of production in the dimension of mining or raw materials. The course of the transaction and its dimension is influenced by such elements as proprietary rights to deposit areas, the size of deposits, and their value. Decisions about integration, especially in the international dimension must be carefully analysed (due diligence) in all relevant aspects of the company's activity. For these actions it becomes necessary to use consulting, expert and specialist firms, and competence persons. Any analysis should take into account the knowledge and experience of professionals in key areas of the company's activities starting from geology, through mining, processing, and metallurgy, to the final product (having a defined market value).

The internal perspective refers to consolidation of strategic units of the company and/or mutualisation of activities. In consolidation practice, we analyse the possibilities of strategic business units (SJB) to cooperate in the scope of products, markets, and the competences of the company with respect to performed functions. Implementation of new activities or their outsourcing should be preceded by careful analysis of such competences in order to avoid any risk.

For the development of a company it is also important to enter into strategic alliances, which are defined as agreements between independent companies for a specific purpose, concluded on the principles of mutually beneficial partnership, while maintaining the organizational distinctiveness of the allied parties. For mining operators the fundamental microeconomic prerequisites to create alliances are resources, market, efficiency, and competence targets. The activities presented above have one main target, which is development of the company and gaining of significant market position.

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