

THE MINING PROJECTS - AN APPROACH IN TERMS OF PARTICULARITIES OF USE THE FACTOR OF PRODUCTION “CAPITAL”

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ABSTRACT: *Regarding the other development projects within an economy, the mining projects (objectified in underground exploitation, day-light exploitation and preparing enterprises) presents specific characters, such as: a great volume of the capital investment; important loss by stopping the invested capital; long period of recouping the invested capital; small rates of profit (or even absent); increased intensity of using the capital factor of production; high value of specific investment. A simple review of these elements determines their contact to the “capital” factor of production. Under these circumstances the given work tries to catch the particular aspects of using the “capital” factor of production in the mining branch.*

KEY WORDS: *factor of production; capital; mining industry; mining project; rate of profit; investment; assets; financing.*

JEL CLASSIFICATION: *D24.*

1. THE SYSTEM OF FACTORS OF PRODUCTION WITHIN THE MINING BRANCH OF INDUSTRY

Basically the fundamental purpose of developing any economic activity is to satisfy the human needs as fully as possible. Subordinate to this aim are, wholly, all the activities in the mining branch.

From the point of view of the specifics, probably no other branch of activity outruns the mining branch of industry. Its own aspects of technological nature (induced

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by the process specifics through which an “agglomerate” of useful mineral substances - deposited in the crust of the earth - is identified, researched and possibly “put into use”), overlapping the specific way of use and/or turned to profit the mining “products” more or less “finished”, determines specificities of an economical nature even larger.

The issue approached imposes a concept demarcation line between two fundamental terms: “factors of production” respectively “resources”. These terms designate two categories of distinct entities within the real economy, even if the terms themselves are used more often having the same meaning. Mainly, the term of “resources” expresses the state of availability of some goods (corporeal and/or not corporeal), without associate them a specific employment field (as for example production or consumption). By their simple existence, related to the production processes, the resources show the feature of a productive potential. In certain conditions, through decisions and other appropriate actions, the resourced are activated by attracting them into a concrete utilization, receiving a certain destination and thus becoming factors of production. As consequence, it can be affirmed that “the factors of production represent those resources brought by user agents in active state, adequate for their use in the productive processes” (Dobrotă, 1995).

In the evolution of economic thinking several debates regarding the number and structure of production factors are recorded. The classical economic school considered the main factors of production as work, land and capital. So, William Petty, the forerunner of the English classic economy said: “work is the father and land is the mother of national wealth” (Angelescu, 2000). Later, the Frenchman Jean Baptiste Say, father of the famous trinity formula, supported the idea that the factors of production are represented by the initial tangible resources “work, land and capital” (Angelescu, 2000), what means those resources which can be managed as stock and flows. Subsequently, as developments in society and especially in the industrial processes took place, technologies, technical progress, information, scientific research, entrepreneur's ability, managing capacity etc. begun to be considered factors of production, under the generic name of production neo-factors.

In the mining branch the production factors system can be outlined by relating to four basic coordinates: work, capital, mineral deposit, production new-factors (technology, information, entrepreneurship).

2. THE STRUCTURE OF CAPITAL INVESTED IN MINING PROJECTS

Within the mining projects a classification of capital expenses can be performed according to several criteria. One of the most used is represented by the nature or destination of the invested amounts, and thus we can distinguish the following (Duchene, 2003):

- general investments;
- investments in surface installation and common precincts;
- investments specific to the exploitation unit (underground or surface exploitation);
- investment specific to the ore preparation plant.

Added to the above mentioned investments are, within the classical “orthodox” concept of some authors, the expenses previously made on deposit researches and

gathering a sufficient amount of information to allow a correct substantiation of the decision regarding commencement of deposit development workings. On this aspect we reserve the right to put forward an objection: any transfer of property rights over a mining field will be preceded by the new proprietor own expertise which almost surely would not accept the investment character of the research expenses done by the former proprietor. From here, an important conclusion for the initial action: the form of continued exploitation of an useful mineral substances deposit rise a specific assessment problem regarding the capital expenses required by transformation of an accumulation of useful mineral substances into economic resource.

For analyzing purposes, the capital expenses can be regrouped in different ways. Such grouping shows the causes, the factors to influence the capital expenses level (Duchene, 2003), which is:

- general infrastructure: communication, access and transportation ways, miners' camp or mining city; added to these sometimes the previous stripping required by quarry exploitation and equipment and works required in order to access the ore deposit (these are capital expenses influenced mainly by the geographic location and the geological structure of the deposit);
- mining equipment, the main influence factor being the nature itself of the useful mineral substance as well as the exploitation methods applied;
- preparation plant (houses and equipment), where the main factors of influence is the technological flux of preparation and its capacity;
- other capital expenses, main factors of influence are the degree of industrialization of the area where the project is in development.

3. TECHNOLOGIES AND INFORMATION - DERIVATIVES OF THE PRODUCTION FACTOR "CAPITAL"

In the mining branch, each technology is characterized by a very well defined identity considering the shape of those conditions that make its application necessary and/or possible, in a precisely specified production process. Choosing the technologies represents one of the most important decision making processes that the management team can be confronted with in a mining enterprise; the mining project's efficiency greatly depends upon its correct solving. A remarkable part of the capital invested in the mining projects was and still remains destined for acquisition of high efficiency technologies.

The unprecedented development of the mining technologies that marked at least the last three decades of the past century allowed realization of some great mining projects, unimaginable before. As well, the technological development (located not only at a level of exploitation and preparation of useful mineral substances, but also at the level of their utilization) allowed exploitation of certain deposits with complicated geo-mining conditions, or with poor concentration of ore, and identification of new purposes for the mineral raw materials.

The turning into goods process of a deposit with mineral substances suppose, in a first stage, collecting, processing and an appropriate interpreting of a multitude of information, so as, as a main, the aspects regarding quality and quantity of reserves, its

deposit conditions in the earth crust to be emphasized. In fact, the stages of a mining project are considered in materialized decisions, founded on the basis of documentation that contain relevant information regarding knowledge on that deposit up to that moment.

4. A SPECIFICITY OF THE CAPITAL INVESTED IN THE MINING PROJECTS: THE ASSETS WITHOUT A TRANSFER VALUE

In order to reach the objective of a operational mine, with a certain long-wall face length, where the production of useful mineral substance is mined, a long process has to be covered, process that usually had begun long time before by prospecting and exploring an identified deposit, was continued with the surface buildings and mine workings both at surface and underground, to reach to a first capacity of exploitation, and finally, with the preparation workings, up to delimitation of face zones and beginning of exploitation from these zones. In the same time with the construction, opening and preparation works, equipping with machinery and specific equipment for workings or operating in faces or for assembling specific installations. It also takes place endowing with machinery, tools and installations for auxiliary and service activities.

All this while resources are consumed, capital invested and some costs are already supported by the one that finances the exploitation unit's putting into service.

The mining unit once realized, has a patrimony resulted from the previous decisions and actions, that show an important specificity: the highest weight factor of this patrimony is detained by those assets without a transfer value (mine workings, special constructions and specific installations). In any decision from a point of view of assessment, these assets show a particular characteristic: they have a value not through the costs supported, but by the results to reach after reserves exploitation. This means, for example, that a shaft that costed 50.000 m.u. has the value equal to zero if the exploitation does not continue, if the reserve counted upon do no confirm or if it is exhausted and through amortization nothing could get recovered.

The shaft and many other workings, mine constructions and installations, unlike an universal lathe in the mine workshop, do not show recovery value or availability through re-selling, but only a usability value by the future profit fluxes, in case of a profitable activity or possibly by savings on expenses, in case of an activity that recovers its current costs of exploitation and accomplishes something extra too compared to these, by selling the mining products.

5. ASPECTS SPECIFIC TO FINANCING OF MINING PROJECTS

Related to the economy in the past, financing mining projects isn't worth approaching. The state was the sole proprietor of mineral resources and land, and in the same time, the only financing source of mining projects. In the conditions of the new economy in Romania, even if the property structure over mineral resources did not change, the state being still their only proprietor, financing mining projects gained new

dimensions, concessions and partnership being more and more frequently brought into attention.

An essential requirement for a successful mine enterprise or project is ensuring the needed capital in order to develop and bring into production a certain mining perimeter. Almost everywhere in the world now, the time passed when a mining perimeter was able to ensure, right from the start, its self-financing (a rich deposit even at surface). A feature of the present stage is the fact that for a good period of time, years, the capital must be advanced, without it being able to produce in order to recover it and attain profit.

The economic practice had proven that in order to have a successful mining project, four factors are essential: *mineral* (raw mineral material basis, the reserves of useful mineral substances), *market*, *money* (needed for financing, the capital needed), *management*.

Among these factors, the importance of the third M - capital funds - has increased, the money necessary to convert an exploration or a research in a useful mineral deposit. Mining is no longer the field of the small entrepreneur. It was, sometimes in the past, but the time when a sole man with money hired a prospector to explore and find deposits, is long gone now. Later, so-called groups of prospectors or unions of prospectors appeared, led by an intrepid engineer with a considerable practice and large knowledge in the field, with a good knowing of his team. On certain geographical areas and sorts of minerals, this formula didn't give satisfaction and financing of first risky actions, prospecting, research, to be undertaken by the state. Even the countries in the third world don't afford anymore concessions of a "come and search" type.

In this context, the problems imposed to an owner of a valuable mining perimeter who also disposes of the capital needed to be invested, can be synthesized as follows:

- justification of investment for exploring and development necessity (reserve quantification, opening);
- justification for the size (capacity) of the future mining unit as degree of economization, exploitation time, integration level (up to which stage of ore processing the future mining unit will go).

A proprietor of a valuable mining perimeter, who doesn't dispose of the capital needed in order to fulfill the project, has even more problems, as follows:

- the two issues above mentioned, necessity and degree of economization;
- presenting the results of the geological researches in such a manner so as to convince a hypothetical investor that the mining unit will bring, through operation, an attractive profit (aspect that can be fulfilled by providing authentic information, full and well prepared documentation, intelligent analysis, correctness).

From the point of view of mining unit's financing, three main stages can be distinguished in the process of transforming a newly discovered deposit into a fully operational mining unit, as follows:

- the overall prospecting and exploration, phase when the geological conditions and whether the mineral deposit is promising are determined. The capital needed to invest is relatively small, but the risks are major (the whole capital is at risk);
- quantification and probation of reserves, stage involving drillings and/or exploration and opening workings, in order to establish the quantities and contents required for a profitable exploitation. The invested amounts are rising, the risk is a bit diminished but still high. The objective is to reach to an amount of reserve deposited in good geological conditions and of high quality features, contents, so as to justify investment in a primary exploitation unit: mine or quarry. In the Romanian practice this stage is known as detailed exploration and this was always financed only by the state budget, on basis of detailed exploration projects finalized with homologation documentation for the reserves. This is the main base that supports the project of a future mining unit (reserve assured). The reserve, from a quality point of view, must justify the capital funds necessary as a minimum for a capacity version that can ensure results, recurrence, acceptable subvention;
- development and construction, involving, usually both mining units (constructions, underground workings, installations, roads, workshops) and preparation plants and even metallurgical refining plants, as needed according to the decisions of integration.

From a point of view of the mining project, it is obvious that following the three stages takes place when it's aimed for a continuing financing, from one stage to another, which means a decreased risk for the newly invested capital. The main issue for a continued financing, from a point of view of the mining project, is the risk. From an investor's point of view, as the risk grows, the cost for financing will also increase and the part of the social capital in the future mining unit demanded by the investor will increase too.

Within a market economy conditions, the financing problems must be dealt with in the context of the relations between the two participants: the owner (who tries to "sell" the deposit) and the investor (the company or group of companies that assumes the risk of ensuring the needed capital for project's development).

The perimeter's value recognized to the owner generates a specific evaluation. The valued recognized to the owner represents his share in the social capital of the future mining unit, that will be carried out in the third stage and will be followed by exploitation phase. In the two previous stages, mine constructions and plant, the risk level is obviously high and financing gets the shape of the risk capital. This part of the social capital implies, basically, a weight or a percentage that the investor recognizes for the proprietor. Thus, in conditions when the Romanian mining will proceed to concessions or parteneriate, an assessment of the value recognized to the owner must take place, as basis of the weight factor assigned to him within the social capital of the future mining unit with mixed capital.

In case if mining unit's exploration and development is already successfully developing, sometimes it is possible that part of the investment funds needed for installations and equipment to be financed by mortgaging debentures or a combination of these and the ordinary ones, with a possibility of converting these debentures in shares, on well-defined time and price conditions. Such a financing way can be applied

in case of already dimensioned units, that handle exploitation processes, with a good management, proved by previous activities - and these happen in case of already consolidated mining companies. When the financing need occurs, regardless if the project is in a prospecting, exploration or construction stage, it becomes necessary that in assessment to have a reasonable reduction, in exact terms, of the estimate profits, by assessment of risk factors.

The risk is determined by internal factors, project-own, and external factors. The internal factors are the ones deriving or concerning directly the project, as entity, and its rank, its place, in the present mineral resources' economy and in the foreseeable future. A responsibility that cannot be avoided by the owner regards the information concerning the mining perimeter, that must be presented in a well-specified material, a shape that proves competence, in form of a report. Such a specialty report regarding mining property must emphasize confirmable aspects, omitted aspects, to distinguish between exact parameters and the approximate ones, to determine the degree of uncertainty for the approximate factors. Based on these data the potential profit can be estimated or determined.

The external factors are the ones acting outside the proprietor's control, outside the perimeter but because of this they are no less important for the project. These factors refer in the first row, to the capital market, thus to request and offer for the risk capital. Regarding this, the action of the following factors must be considered:

- main economic tendencies (conditioned by the political climate);
- monetary and financial conditions, as, generally, the credit amount and its availability;
- interests rates;
- competition with other types of projects "searching" for a risk capital, as in the petroleum branch, chemical industry and others.

Obviously, a successful financing of a mining project is most probably to be accomplished when the external and internal circumstances will be favorable, and the foreseeable difficulties and costs will be diminished as consequence of a favorable action of both categories of circumstances.

In financing the mining investment, the owner must ensure a motivation for the investor and to show initiative, and his chances of success will grow not only by an attentive preparation of the information regarding internal factors, but also by a competent assessing, weighing of those external factors that will enter the final assessment when determining the final results.

6. CONCLUSIONS

In a synthetic form, the main conclusions that can be drawn are the following:

- by the concept of "resources" as general meaning, is expressed the availability status of certain goods (corporeal and/or not corporeal), without univocal associating them a sealed use;
- "the resources" are transformed into "factors of production" by attracting them into a certain concrete utilization (only the "resources" brought into an active state become "factors of production");

- recurrence to the invested capital represents the main criterion in taking the decision regarding the projects with long term capital, and ignoring it can lead to onerous decisions that can generate major unbalances at a branch level or even at a national economy level (the way of the mining branch development before 1989 renders evident the lack of importance given to this criterion in the past);
- in the mining projects a classification of the capital expenses can be carried out according to several criteria, the most used ones being the nature of investment and the factors determining it;
- the capital invested in the mining projects shows a distinct specificity: it became almost entirely materialized, in assets without a transfer value (mine workings, special constructions and specific installations);
- in any decision taking, from a point of view of assessment, the specialized mine assets show a specific feature: they have value not through the costs supported, but by the results to come to consequently to exploitation of the useful mineral substances;
- reported to the economy in the past, when the state was the sole investor in the mining branch, the mining projects economy isn't worth being studied;
- the economical practice showed that in order to have a successful mining project four factors are needed: the base of raw mineral material, the market for selling the mining products, the capital needed for investment, management;
- from a point of view of investment in mining projects, three major stages can be distinguished in the process through which a discovered deposit partially researched, is brought into a state of an operational mining unit: overall prospecting and exploration, reserve quantification and probation, development and construction of facilities;
- transition from one stage to another suppose decisions, always in different conditions from the point of view of the available information, but with financing needs (the capital required) always increasing.

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