

## **POSSIBILITIES FOR USING THE EFFECTS METHOD IN MINING PROJECTS ASSESSMENT**

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**ABSTRACT:** *Some distinctive essential aspects, characterizing most mining projects - the high level of investment effort, the major impact upon turning to good account of a significant part of the national wealth (the useful mineral deposits), the extremely limited character of the state's available resources (the only one to finance such projects) - have transferred the problem of their financial evaluation from a microeconomic level to a macroeconomic one. A macroeconomic assessment supposes an identification and quantification of all effects taken by two fundamental alternatives - "with" or "without" a project, at a social and economical scale. On this assertion there could be determined the added value corresponding to each way, the alternative having the highest added value will be considered feasible.*

**KEY WORDS:** *mining projects, macroeconomic assessment, effects method.*

**JEL CLASSIFICATION:** *D24*

### **1. INTRODUCTION**

Analysis of mining projects from an economic perspective (Ask the company operating underground or day), which are highlighted various deposits of useful minerals, highlights some key features specific to them, namely:

- large volume of capital investments;
- long-lasting recovery of amounts invested;
- losses by securing significant capital due to relatively long periods (sometimes up to 10 years) to achieve;
- low rates (or no) of profit;
- high-intensity use of inputs "capital";
- high value of the investment-specific.

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All this gives the mining sector projects individuality in relation to other development projects in the economy. However, the extent to which such projects are promoted and supported, and how to achieve them have a powerful impact on an important component of national wealth: the reserves of useful minerals.

All the peculiarities previously submitted and current economic and financial situation of mining enterprises in Romania (actually mining industry as a whole) problem transferring necessarily require assessment of mining projects of national importance in macroeconomic microeconomic level.

Financial and economic feasibility of such projects should not and can not be assessed only on the basis of specific indicators microeconomic level, but also requires consideration of macroeconomic aggregates sizes .

Only so can be highlighted effects induced by these projects in the national economy, reflected effects of flows of goods, services and money arising from mining branch and other branches of the economy and between branch mining and state budgets.

## 2. INFLUENCE FACTORS OF ECONOMIC EFFICIENCY

Economic efficiency is a highly complex synthetic indicator, which is influenced by many factors. These factors can be classified according to several criteria, as shown below.

**A. Criterion of how the factors acting.** In relation to this criterion are distinguished two types of factors, namely:

a) direct-acting factors: level training and workforce training; quality fixed capital used in production; structure of capital used in production; degree of workability and quality of natural resources attracted in the economic cycle; methods of management, organization and production scheduling directly used in practice; the technical progress; the quality of products; a certain market position; the organization of ancillary activities within the company.

b) indirect-acting factors: the modernization of business - units in related industries; quality raw materials; technical performance of equipment made by supplying branches; quality of education at the national level; structure of demand for products and services in the market; reorientation demands of society; ensuring a certain degree of civilization and comfort of the people.

**B. Criterion of factors character.** In relation to this criterion are distinguished four categories of factors, namely:

a) technical and organizational factors (related to technical and organizational measures regarding the introduction of technical progress and improvement of the methods of organizing production and labor): type production technologies used; - the degree of mechanization and automation of production processes; management system used; existing skill level labor and skill level required by the technologies used; labor discipline; the use of working time; efficiency equipment; productivity; consumption norms; utilities required.

b) economic factors (related to material, human and financial resources of the company): types of materials used; specific consumption of materials; labor

consumption; production costs; product selling prices; position in the market; how to provide sources of funding; cost of borrowed capital.

c) social-political factors (connected directly to the nature of the relations of production and the economic and financial policy of the state): social situation of the area in which the enterprise is located; relations-union employers; union-types of claims; existence of certain rules at sector or branch of activity; subsidizing production; existence of certain strategies on branch.

d) natural factors (related to particular conditions): the geographical area where the enterprise is located; topography and climate conditions; location of the company in relation to residential areas; main ways of transport and utility networks; the industrial development of the area.

**C. Criterion of factors inclusion.** In relation to this criterion are distinguished two types of factors, namely:

a) general factors (acting in any field), presented in the previous criteria;

b) specific factors (which falls in the category without exception, almost all the natural factors which are of particular importance in mining branch): type deposit; location of the deposit in the earth's crust; deposit form; depth from the surface; volume (tonnage) reserves; characteristics substance minerals; geo-mechanical characteristics and physico-chemical properties of the surrounding rocks; geo-mechanics rock-coverings; tectonic deposit; existence of gas in the reservoir; existence of water reservoirs; deposit hydrogeology; contents in useful components; cooking options; opening and operating methods can be applied; technical labor safety rules need to be respected.

### **3. PARTICULARITIES OF THE ECONOMICAL EFFICIENCY IN MINING BRANCH**

The production of branch mining is conducted in both units for minerals extraction and preparation units. The relationships that are formed between inputs material, financial and human in production in this sector compared to the different manufacturing industries.

The branch operation mineral resources deficiencies in the labor relations shows specificity means that labor and work is in constant motion while the work object (rock or deposit of useful minerals) is fixed. Continuous movement of labor aims both handling and supervision of machines, equipment and installations working and traveling from one job to another.

Another feature of the production process mining branch is the fact that always work requires knowledge of the subject prior execution of geological and topographical research subsoil and deposit works generating additional costs.

Continuous shifting of jobs in underground work conditions characterized by varying pressures permanent mining of gas fumes, flood water and rocks surrounding the reservoir characteristics and the occurrence of random events, the previously unanticipated, causes in the organizational structure mining sectors performing specific maintenance characteristics mining, insurance normal parameters of the atmosphere of jobs, insurance jobs utility, degassing layers coal, waste water, which is another feature.

Specific conditions in which the production process in mining branch generates high consumption of inputs per unit of product, particularly high consumption of labor, which is a special feature of the operation of underground minerals.

Considering the actual conditions of the production deployment in branch mining can highlight one more feature, namely the permanent concern for the proper production scheduling and the introduction of complex mining technology based on mechanization and automation of production, which of reducing human effort and providing increased security measures work.

Mining industry activity is directly related to the existence of exploitable reserves underground in certain geographical areas. This raises an important feature, namely on territorial location under severely restricted relief, climate, human settlements and industrial economic activities. Becomes necessary in solving special problems related to providing access in areas with reserves of useful minerals, development of housing construction, social and administrative colonies located in remote areas, long-distance transport of personnel to jobs, grid connections local and national transport networks for water, power and heat.

Solving such problems requires investment performance of work requiring the existence of adequate financial funds. Appears as a new feature of the production mining branch namely that it involves carrying out mining capital expenditure objectives with a particular structure, which is directly influenced by the specific territorial location of mines.

Toward the above, exploitation of coal presents particularities with even more. By its scope, coal mining branch provides both the necessary industrial coal consumption (energy branch, the steel industry, etc.) and social consumption of the population. Viewed from the share of coal in the national energy balance, coal mining can be considered complex strategic branch of the national economy. Being strategically important industry, its activities should be continued, even if sometimes caused by coal mining costs are very high and cannot be covered by the selling price. This raises the need to subsidize coal production, which is another characteristic of the production process in this sector.

The production of coal mining branch aims extraction directly from nature reserves of coal, causing more significant changes in the natural environment, some irreversible, which is actually another feature.

In this context, human influence on the environment caused by coal mining activities and non-coal must consider two main issues, namely: socio-economic effectiveness of introducing national and international economic circuit of useful mineral reserves however, is a national or international wealth exhausted, that assessment of the effects of branch activity on the natural coal in designing and implementing solutions to protect natural and remove the effects of environmental pollution when it was damaged. How to solve these two problems cause a certain strategy to develop the mining sector as a whole.

Ensemble technical and technological features above constitute, economic, particularly economic efficiency operating branch reserves of useful mineral substances.

#### **4. USING THE EFFECTS METHOD IN MINING PROJECTS ASSESSMENT**

Effects method was originally designed for developing countries. It appeared, however, that you can apply them even in economically developed countries (eg France, starting in 1970).

In times of crisis, even in developed countries, there was a significant under-utilization of various categories of labor (unemployment), under-utilization of production capacity and a significant dependence on foreign trade (but not in the sense that, given globalization, trade flows have surpassed national borders, making a reality of the global economy).

It is quite obvious that Romania, categorized developing country, and who are in a period of transition from centralized economy to free market economy is characterized acute mentioned: unemployment, underutilization of capacity and dependence on foreign trade.

Therefore, evaluation of mining projects of national importance (projects to continue operating through modernization, reconstruction and development or new development projects) will not be able to bypass the method effects.

The method involves the effects of four phases:

- Overview of the project;
- Analyze the financial return of the project;
- A study of economic evaluation is to compare two alternatives to satisfy domestic demand same: Alternative "with project" and alternative "without project";
- Drawing conclusions on the evaluation of the project after effects method.
- Each of these phases will be given below;
- Overview of the project must be carried out in technical and economic terms.

The technical aspect is considered: the conditions of ore reserves of useful mineral substances, quality, opportunities for expansion of reserves required opening mining, mining methods, mining technologies, techniques of preparation.

The economic aspect is reflected in the specification of the following: capital expenditure required and the timing of their annual operating expenses and maintenance, annual gross revenues from the sale of mining production, the economic life of the project.

Special attention should be paid to the structure and keeping operating costs to be properly identified destinations monetary flows posed.

Annual gross revenues are estimated taking into account the quality of the output produced and mineral commodities market.

In analyzing the financial return of the project will be considered important alternative substance minerals.

Will be considered by the project, the domestic market will be provided with a mineral raw material of the same quality and the same price as in the use of imports.

Also, for future mining company (performed by the project), will be considered to overhead costs and payments department, they are treated as internal transfers from enterprise branch.

Fundamental indicator for assessing the financial feasibility of the project is the result of gross operating rate, calculated as a ratio between annual gross operating

result and the investment required for the project. It can be also established internal rate of return of the project and the term (discounted) payback.

Economic evaluation of the project is in a process developed over five phases:

- precise definition of equivalent statements in terms of satisfying domestic demand that production be a done project (alternative "with project") or not done (alternative "without project");
- alternative analysis "with project " in terms of induced expenditures, to conduct this analysis it is necessary to have economic information on both the project itself (structure costs, capital expenditures reflected in the structure and the operation and maintenance), and the entire economic system it would integrate (picture input or input- output between branches);
- analysis on the same terms, the alternative "no project"
- comparing alternative "to project" the alternative "no project" to reflect the net effects of the project on the national economy;
- presentation as indicators of the effects that the project will induce the economy (on this basis will be assessed interest that the project poses to the national economy).

The analysis of the two alternatives, "with project" and "without project" involves, first, an identification of the main activities that generate costs in each of them.

There is then a disaggregation of the total amount of these expenses to reveal how much of their value lies consumption from domestic production and imports as returns.

Because it has a picture showing the structure of intermediate consumption, consumption of domestic production are, in turn, analyzed as: how much was their contribution to the achievement of domestic and import as represented.

In this way it can be revealed eventually, the indicator will be the basis on which the project compared the two alternatives, represented by the "added value".

A comparison also take into consideration the overall, for each alternative in part, the effects on:

- income populations and their distribution in the country, due to the wages paid to employees;
- the state budget and state social insurance budget through fees paid and any payment of their tasks (eg, unemployment benefits if one of the versions, the "no project" requires dismissal of staff and not hiring unemployed already existing);
- employment in economic sectors upstream and downstream of mining branch;
- the creation of additional regional income;
- volume and dynamics of investments in mining branch and other branches;
- production of other branches;
- foreign trade, balance of payments and foreign exchange reserves in the country.

Applying the effect ends with the conclusions that should be highlighted superiority in relation to the possibilities and needs of the national economy of one of the two alternatives, reflected in a synthetic indicator which can be either value added rate (calculated as the ratio annual percentage of the value added and the total investment) or additional value (calculated as the difference between the annual added value of the two alternatives, "with project" and "without project").

## **5. CONCLUSIONS**

Diversity calculations that the method entails effects would only reflect the diversity of objectives and existing restrictions.

This diversity can however be structured around two main poles:

- pole "national economy", where they will be retrieved global economic calculation and partial calculations of various aspects relating to national objectives and restrictions (economic growth, balanced budget, unemployment/jobs, increase the general welfare);
- pole "enterprise", where they will be found financial calculations of return, taking into account the financial stability necessary restriction reflecting the company.

On these calculations, we have to remember two things.

From the outset, it should be clear that there is no a priori reason leading to the need to achieve results consistent with their performance. It is obvious that these calculations are based on different rationales: the first is based on reasoning "plan", with its restrictions and objectives, and the other, on the undertaking reasoning 'market'. Any inconsistency between the two types of calculations would only reflect on the project, the contradiction between the two logics: a "plan" and "market".

No synthetic computing aims, ex ante, to reduce this contradiction is not possible. One such attempt will only mask the contradiction and not to eliminate it. But the method is precisely this role, highlight the contradiction in the economic evaluation stage, ie to assess the economic policy adopted (tax, customs, credit, grant, etc). Capable of conducting two types of calculations to results comparable.

The second aspect is that the assessment calculations "national economy" is likely to be reduced, ex ante, to a single global economic calculation.

The diversity of these calculations would only reflect the diversity of targeted objectives and constraints encountered in the national economy when it takes into account the limited resources of the state budget allocated differently among the various branches of domestic economy.

Although extensive calculations assume a significant amount of information on the project under assessment (intermediate consumption coefficients between branches, for example), consider the use of the method in assessing the effects of mining projects of national importance is absolutely necessary, because only in this way that can be realized fair allocation of state resources, while emphasizing, for every project, it has multiple effects on: employed labor income; employment available; state resources; activities and application in various branches of the national economy; regional development of the country.

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