THE POTENTIAL VALUE OF A MINING PROPERTY

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ABSTRACT: Analyzing the possibilities to using the traditional assessment models (patrimonial and based on result updating) in the particular case of the mining companies in Romania, it led to conclusions that show its non-applicability at least in certain forms and in specific special situations. Thus, the special assets value in the mine patrimonies cannot be approached unless on the context of continuing exploitation activities and in a tight relationship with the mineral substances reserves to whose turn to profit the activities would take part in. Due to this usage particularity of the production factors capital and deposit the value approach through flow, as an economic value seem more opportune. In present though, the most majority of the mining companies in Romania operate with exploitation losses which are partially or totally covered by state finance subventions. This completely improper operating from an economical point of view rise insurmountable barriers for usage of assessment patterns based on updating the future cash flows. In these circumstances, it appears as a requirement the necessity of developing new assessment patterns that would be able to offer a relevant image, closer to reality, over the value of an operational enterprise or over the value of a mining perimeter that is partially developed. Such a model is developed as follows.

KEY WORDS: Mining property, assessment model, economic value, potential value

1. FOREWORD

For Romania, the issue of companies assessment is one occurred recently (and imposed by structural alterations intervened in economy after 1992). The connection of the mining branch to the new economical mechanism had taken place late; the issues related to re-structuring, efficiency increase and privatization are, even at present, far from being completely solved. Thus, it could be seen as justified a certain lack of attention at a methodological and procedural level that affected the problem of mining properties assessment.

The traditional assessment models, patrimonial and based on result updating cannot be applied though in the case of new or partially developed mining perimeters [2], [10]. Mainly, these represent a particular case of assessment of mining properties due to the incertitude related to volume and quality of reserves (a deposit of useful

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mineral substances come to be known as a whole only in the moment of reserves exhausting) the world economical conjunctures (a continuous variation, sometimes unforeseeable, of the prices for the rough mineral materials), the technological developments (some imposed even by a more and more limited character of certain mineral reserves) the political stability and the government actions (a certain fiscal and social politics), evolution of ecological actions and programs [13].

The new and partially developed mining perimeters are related in an organic way, the concept of "potential usage value" [7], met, in an approximate form, in most of the resource economy related paper works, but in an inaccurately defined and incompletely explained. Any mining perimeter which is new or partially developed has a certain potential value (even for the fact that the useful mineral reserves represent a special form of capital) [6].

Technologic and economic changes imposed a continuous migration of the barrier that separates the exploitable reserves from the marginal or sub-marginal ones. The economic results of exploiting a useful mineral deposit are variable in time, but the potential value of the deposit is related to its commissioning. The deposit value exists in any moment but it can be higher or lower, according to the economic and technological conjuncture [5].

2. MODEL FOR DETERMINING THE POTENTIAL VALUE OF A MINING PROPERTY

Analyzed from a financing need perspective, timetable to reaching the profitable operating rate and a foreseeable economical potential, a new or partially developed mining perimeter resembles to a company in difficulties but recoverable. A recoverable company in difficulties would continue its initial activity or starts a new one in the so-called period of recovery, period that lies along many years and when the company works under its capacity, having positive or transient results; the procedure of recovery can fail at any moment [2]. The new mining perimeter will be researched, prospected, explored and developed; the first production facilities will be commissioned, later reaching the designed production output.

Throughout all this period, similar to the recovery period of the company in difficulty, capital shall be invested, with the aim of acquiring profit in the future. Sometimes, the recovery procedure fails. Similarly, not any mining perimeter will be brought into the profitable exploitation state: if the preliminary assessments do not confirm profitability, the perimeter may enter the conservation or closure state (regardless the stage of exploitation or development workings).

For the purpose of assessing the recoverable companies in difficulty, specialty literature recommends, unanimously, using the value in due time model. Due to the feature of recoverable company in difficulty of the mining perimeter either new or in development state, it is considered as usable the value in due time model to determine its potential value [9].

On the basis of applying this assessment model are the forecasts regarding [3]:

- time interval when a profitable mining company having relatively constant results will be settled down;
• evolution of the yearly mining company results (emphasizing the yearly needs of financing);
• investments in capital needed to bring the new mining perimeter in a profitable operating state).

The potential value of a new or partially developed mining perimeter is determined with the formula [11], [12]:

\[
VPT = \frac{VT}{(1 + r)^n} - INVA
\]  (1)

where:
VPT - the potential value of the mining perimeter;
VT - value on due time;
r - rate of update for the due time value;
n - number of years of the time needed to set down a profitable mining company;
INVA - the update value of the sums that need to be invested in order to bring the new or partially developed mining perimeter in a state of profitable mining company.

The value on due time represents the value of the established mining company in the first year of the profitable work period of time when it has relatively constant results. In order to determine the value on due time it is used the formula for the capitalization test, according to which:

\[
VT = \frac{B_n}{r^*}
\]  (2)

where:
B_n - the net profit in the first year of the profitable operating time with relatively constant results;
r^* - rate de capitalization that, basically, differs from the updating rate r.

The capitalization rate, r^*, is chosen by assimilation with the revenue rates for the invested capital shown by similar mining companies (as kind of mineral substance exploited, size, applied methods and technologies).

The rate of updating, r, comprises a base rate and a risk bonus [4] which means

\[
r = a (1 + p)
\]  (3)

The base rate, a, can be the efficiency rate of obligations, either in the public or private sector, or shares of a similar companies. The risk bonus, p, expresses the specific risk of transforming the mining perimeter new or partially developed in a mining company having a profitable operation. The size of this bonus is decided taking into account the following:
• risks of unfulfilling forecasts regarding financial results;
• risks related to reliability of the volume and mineralization data (available at the assessment time);
• risks related to applicability of "recognized" exploitation methods and technologies (for which a good practice exists);
• risks related to a future development of rough mineral material markets;
• risks related to a certain future development of fiscality at the mining branch level.

The final value adopted for this rate should express a differentiated risk shown by the new established mining company in comparison with similar mining companies.

The sums that need to be invested to bring the mining perimeter in a profitable operating state having relatively constant results are disposed in time on a certain manner. As consequence, these shall be updated so as to be brought at the moment when the assessment is carried out. The updating rate used is r, the INVA term having the following form:

\[ \text{INVA} = \sum_{t=1}^{n} \frac{I_t}{(1 + r)^t} \]  

where:

- \( I_t \) represents here the sum that needs to be invested for development in year t (from today into the future).

It must be noticed that applying this assessment model is not mistaken by applying the model based on results updating. The assessment model based on future results updating does not surprise the "sunk" costs character of many investments required to establish a mining company [1], [8].

The model of due time value ignores the sums invested up to the moment of assessment (confirming the "sunk" costs character, passed costs, definitively supported, regardless of options on the mining perimeter's future). It is considered that by this, the proposed assessment model brings a superior quality tone in the preliminary assessments imposed by founding of decisions on a future development of a mining perimeter, so enrolling in the new assessment concept that should be promoted at the mining branch level.

3. STUDY OF A CASE: DETERMINING THE POTENTIAL VALUE OF A MINING PROPERTY

The declared objective of the case study is represented by an exemplification of usage for assessment models in determining the potential value of a mining property.

The case study is developed on the basis of an apparently simple example and it resorts to considering some hypothesis specific to the economic environment in Romania.

The geological prospecting and explorations led to shaping a new mining perimeter, so confirming existence of an industrial reserve of approx. 13,000,000 tons hard coal. Exploitation of the hard coal reserves shall be carried out in underground mode. The project of render valuable the pit coal reserves had been started 4 years ago, investing in it 8,000,000 USD (workings or prospecting and exploration, design, mine
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constructions), with the following dispose in time: year 1 - 500,000 USD, year 2 - 1,500,000 USD, year 3 - 2,000,000 RON, year 4 - 4,000,000 USD. The first year of production is year 5 (100,000 tons). The production capacity designed is 600,000 tons/year, and it is estimated to be reached in year 9 (after which the mining unit will work at this production capacity, another 19 years).

During the period of the first years exploiting the reserves, production will have the following dynamics: year 6 - 200,000 tons, year 7 - 300,000 tons, year 8 - 400,000 tons.

The estimate price is 63.80 USD/ton, value of mining revenue being 4%. The capital required for investments is the following: mining constructions - 35,750,000 RON (year 5 - 6,250,000 USD, year 6 - 9,000,000 USD, year 7 - 10,000,000 USD, year 8 - 10,500,000 USD), machinery and equipment - 21,000,000 RON (year 5 - 2,000,000 USD, year 6 - 4,000,000 USD, year 7 - 6,000,000 USD, year 8 - 9,000,000 USD), rolling fund (working capital) - 5,000,000 USD.

The exploitation expenses (direct and indirect), the general and managing expenses had been estimated by comparison with mining units in operation (which belong to the same company). The amortization of investments in mining constructions will be realized in reference with the reserves amount, and of machines and equipment related to a normal use lifetime (7 years). The income revenue tax is 16%. Assessment take place at beginning of year 5 (time of commissioning).

The potential value of a mining property expresses the proficiency of its future exploitation, taking into account the capital expenses needed to bring it into a position of a profitable exploitation.

In a previous paragraph the model of value in due time has been proposed in order to determine the potential value of a new or partially developed mining perimeter. The model will be applied, following, using the data regarding a mining property.

The value in due time represents the value of a mining company in the first year of its profitable activity with results basically constant, determined on the basis of the capitalization test formula, i.e.

\[ VT = \frac{B_n}{r^*} \]  \hspace{1cm} (5)

where:

- \( B_n \) - the net profit in the first year of the profitable operation with mainly constant results;
- \( r^* \) - capitalization rate.

Using the data in the example, it results

\[ VT = \frac{13,660,440}{0,12} = 113,837,000 \text{ USD} \]

The potential value of the mining perimeter is determined with the formula
\[ VPT = \frac{VT}{(1 + r)^n} - INVA \] (6)

where:
- \( r \) - rate of updating the value in due time;
- \( n \) - number of years in the period of setting up a profitable mining company;
- \( NVA \) - the updated value for the sums that need to be invested in order to bring the new or partially developed mining perimeter in the position of a profitable mining company.

The rate of update, \( r \), comprises a base rate and a risk bonus, which is
\[ r = a(1 + p) \] (7)

The base rate is equal to the capitalization rate, i.e. \( r = 12\% \). For the risk bonus a value of 75\% is adopted. As consequence,
\[ r = 12(1 + \frac{75}{100}) = 21\% \]

The sums that need to be invested to bring the mining perimeter into a position of a profitable operating having mainly constant results shows a certain disposal in time. For the example data,
\[
INVA = (6,250,000 + 2,000,000 + 5,000,000) + \\
+ (9,000,000 + 4,000,000)(1 + 0.21)^{-1} + \\
+ (10,000,000 + 6,000,000)(1 + 0.21)^{-2} + \\
+ (10,500,000 + 9,000,000)(1 + 0.21^{-3}) = \\
= 45,929,259 USD
\]

The potential value of the mining perimeter results
\[
VPT = \frac{113,837,000}{(1 + 0.21)^3} - 45,929,259 = 18,328,760 USD
\]

It should be noticed the model of value in due time does not produce much different results when compared to the well known model, based on profit updating. Although, a much greater influence intervene - the influence which the way of quantifying the risks implied by the specific mining perimeter that had been assessed.
4. CONCLUSIONS

The mining perimeter represents a well defined perimeter that is subject either of mineral resources exploration activities for the purpose of underground or surface exploitation of these resources, or of some exploitation and valorifying activities for deposits of useful mineral substances already known.

In assessing the mining properties it must be taken into account a fundamental aspect: their value is conditioned but not wholly determined by the quantity and the quality of useful mineral resources in their underground (which is by the characteristics of the production factor deposit). This is because rendering valuable the reserves implies material and other kind of efforts, and consuming some resources in a process with an economical dimension which is expressed mainly by expenses of capital, revenues and operating expenses.

Additionally, even if the process finality is establishing an unbiased value (fair value) of the mining property, it may appear as necessary to form concrete answers to other questions also, as for example:

- which is the total value of capital investments needed in order to bring the mining perimeter in a certain condition of efficiency?
- which is the time needed to reach efficiency?
- which is the value for the presumed yearly profit and what part of this will be used to remunerate the stock holders (distributed as dividends)?
- which is the time interval needed to assure retrieval of all initial capital expenses involved?
- which is the yearly level of expenses required to maintain the production capacity of the perimeter?
- which is the returning rate presumed in the development project for the mining perimeter?
- which are the possibilities to extend the surely known reserves at the assessment time?
- in the market context and in a certain economical conjuncture, which would be the market value for the mining perimeter?

Finding the answers to such questions amplify the difficulty of the assessment process for the mining property, adding an obvious qualitative dimension to it.

REFERENCES:


