

Methodical Approach to the Rent Considering in the Mineral Resources Evaluation

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Abstract. Movement to the multisectoral economy strengthens the tendencies of development and improvement of rental relations and ways of accounting rent as the assessed value of natural resources. At the same time, objective ecological and economical assessment should provide an adequate share of profit to every participant of development and processing of minerals: to the state and to the region – the administrative unit of RF, as the proprietor of the subsoil and minerals (obviously, this is the absolute rent and differential rent I), to the shareholder or the leaseholder, to the production worker (differential rent II), to the financier (the state, the bank or other legal entity), which have pretensions of the interest.

1 Introduction

According to the classical definition, rent is income brought by the factor of production, whose supply is absolutely inelastic during a long period of time.

The supply of natural factors (environmental resources of certain quality, appropriate for the existence of the society, soil, minerals etc.) in commodity-money relations are absolutely inelastic due to their limited nature, exhaustibility and irreplaceability. The size of the rent depends on the demand on these resources and on the decreasing supply due to the decrease of natural productiveness.

Demand on natural resources is a derivative of the demand on the products produced on the base of natural resources, which run out in the course of time, so total natural rent and therefore the price of natural resources should increase in the course of time due to the increase of the demand on the goods produced on the base of natural resources, especially fossils, with the use of environmental resources.

2 Materials and Methods

The opponents of the rental approach of price formation on natural resources and of collecting rental payments in today's Russia are new proprietors and raw departments, which take a significant part of the natural rent, especially on energy resources, for their own. It should be admitted that this situation is caused not only by the political and economical system, but also by existing defects in methodology of accounting rent and forming rental taxes.

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Russian administrative units, city municipalities and almost all local government bodies will be political allies in introducing the rental scheme of taxation. Many depressed territories will gain profit. But the level of political power of underdeveloped territories in the government and the State Duma is not high, so the Federation Council is the only body that can give serious political support due to the system of its formation, which provides representation of every administrative unit. Ecological and land departments are also interested in this system. In case of replacing profit and extra cost taxes by natural resources and ecological taxes, high-technology enterprises, which will have an opportunity to reduce the occupied territory, the negative impact on the environment and resources consumption in general, will join the alliance.

In relation to all foregoing it seems necessary and timely to develop and use the rental approach of price formation and taxation for natural resources.

Despite the long discussion of economists and ecologists on the topic of essence of ecological expenses [1-3], the answer is not clear yet. Ecological expenses are still defined as expenses connected with reconstruction of environment, which is, as a rule, already significantly polluted due to anthropogenic activities (purification of polluted water, waste burial, recultivation of land etc.). Ecological damages, involving a significant part of society's expenses, somehow stand beyond the borders of ecological expenses, and ecology-economical damage, arising from the debasement of the quality of the environment and appearing as money terms of losses connected with ecological risks, is still taken out of economical accounting of the costs of production of the raw mineral sector [4-6].

As a result, objective ecological and economical losses, taken by society in the matter of nature consumption and resource depletion, are not presented in macro- and microeconomical calculations [7-10].

While estimating the efficiency of environmental actions, the index of "reduced", in fact, ecological damage is considered as "prevented" and is considered as the only criteria of effect.

3 Results and Discussion

Ecology damage, socially approved from the point of state interest, appears to be ecological rent, according to the definition. Rent is the additional profit caused by the limited nature of natural resources and various natural and artificial factors. This damage is a loss of additional profit, which would exist if there was not any damage. Ecology-economical damage is a loss of ecological rent from the economic side, so can be calculated with the same methods as ecology-economical damage:

$$R_e = -D_{ec-em} \quad (1)$$

where R_e – ecological rent, D_{ec-em} – ecology-economical damage.

At the same time, the sum of mining and ecological rent is mining-ecological rent and a part of cost of natural capital.

$$R_{me} = R_e + R_m \quad (2)$$

where R_{me} – mining-ecological rent, R_e – ecological rent (including water, ground and atmospheric rent), R_m – mining rent.

But the methods of calculating absolute rent and differential rent I, which should precede the definition of rental income, are not defined, also it is not clear if normal profit, not connected with rental income, appears in this situation.

In the latest scientific works, devoted to the substantiation of rental relations, more attention is given to the distribution of rent and to the definition of the subject of its recipient, rather than to the methods of its calculation and accounting in the prices of raw materials.

As a result, current scientific mission is scientific and methodic provision of calculations of rental income for accounting them in costs and prices of raw minerals and for improving taxation system in mining industry.

In the process of restructuring of coal industry, more than 150 coal producers were closed because of economic unprofitability and hard highland and geological conditions, at the same time the speed of reproduction of coal reserves decreased more than on 80%. Expenses on environmental protection and reconstruction of nature fell by a factor of 25.6, including the tendency of increase of unit expenses of ecologic resources and waste capacity of coal production.

At the same time production expenses of coal producers increase and their profitability annually decreases (from 28% in 1993 to 0,3% in 2002). In the last years, despite the quick closing of unprofitable coal producers, there are still no conditions for even simple reproduction in coal industry.

However, comparing analysis of volumes of coal mining gives evidence that in the majority of energetically developed countries the volume of coal in the fuel and energy balance and in the structure of consuming is much higher than in Russia.

Transition to the use of gas in energetic and low inner prices on gas led to the uncompetitiveness of coal industry in general. It is connected with underestimating the rarity, exhaustibility and limited nature of natural resources and with poor accounting of natural factors – mining, geological and ecological conditions. It is known that in developed market economy these factors are taken into account with the help of such a tool for redistributing income as rent.

But a range of methodic questions connected with defining different kinds of rent and redistributing rental taxes in mining industry in conditions of forming market relations are still not solved.

Despite the separate declarations of scientists-economists, for a long time rental relations in subsoil management were not accepted in our country due to the only existing kind of property - state. Separate principles of rent-forming relations were used even in conditions of state-planned soviet economy. For example, in mining industry with the help of rate per tonne absolute rent was partly accounted, and unprofitable producers which objectively functioned in the worst mining and geological conditions received grants through the system of redistributing income, so the rent was partly accounted, though it was not called so. Zonal prices existed, they were higher for the areas with low natural productiveness for providing normal financial profitability. That was a kind of accepting differential rent.

The graph on the fig. 1 corresponds to the rental theory of defining the costs of natural resources.

On the graph one of the main principles of commodity production: the larger is the involvement of natural resources into commodity exchange, the larger is the profit. Putting the rental theory into practice stimulates the complex use of produced mass; production of larger amount of user values; the diversification of mining industry.

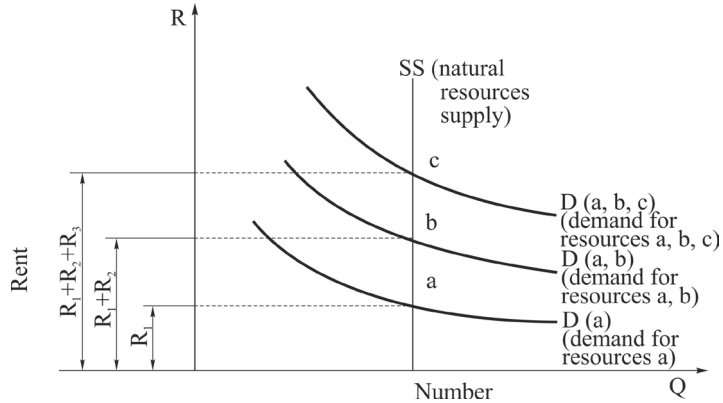


Fig. 1. Graphical interpretation of the rental approach of estimating natural resources

According to the classical economic theory, the price of a natural resource P is proportional to the cost of rent R and inversely proportional to the norm of bank interest I_b :

$$P = R / I_b \quad (3)$$

So, rent in monetary terms is defined by the price of the natural resource P and existing in the current moment norm of interest I_b :

$$R = P / I_b \quad (4)$$

Consequently, one of the measures should be constant. In conditions of methodical imperfection of existing prices rent can't be fixed objectively.

The attempts of presenting rent as the difference between factual and standard profit are also baseless, as there is no standard profit in conditions of market.

Requirements to the development of market relations on the home coal market, necessity of creating different competitive opportunities to the enterprises in mining industry, i.e. protection of the process of normal reproduction, lead to the necessity of turning to the sense and functions of rent for its monetary defining.

Economical reproductional function of rent consists in redistributing extra income and additional income from exploitation of natural resources. It is necessary to account that this additional profit or additional extra cost should be reflected in the prices on raw minerals. So, for answering the question of the ways of this redistributing it is necessary to turn to the conditions of formation of all kinds of rent, including the fact that it is always caused by additional labor expenses.

The condition for the formation of rent is the fact of the limited nature of natural resources. For maintaining a certain level of satisfying the demand or "deliveries" on the natural resource market it is necessary to reproduce them at least in the same volume.

Consequently, the minimal monetary cost of rent should cover expenses on searching for new deposits, on exploring new land, on the reproduction of the quality of environmental resources, on covering socially explained ecology-economical damage:

$$R_a = E_d + D_s \quad (5)$$

where: R_a – absolute rent;

E_d – expenses on searching and exploring new deposits;

D_s – socially explained unavoidable ecology-economical damage.

The most nature capable industries (by the level of influence on the environment) or industries, for which natural resources are working materials, have to use not only the best and average by their quality resources, but also the worst, more expensive – for satisfying the demand on their production. The worsening of the conditions of production and of the quality of natural resources is an objective law of development of mining industries. Consequently, with the flow of time “the best” unavoidably turn into “average” etc. Low accounting of this fact while defining the strategy of restructuring of raw mineral complex in coal industry, in our view, complicated the process of reforming of relations in nature consuming sphere, caused the lack of funds for the reproduction of raw mineral base and for taking nature protective measures.

Differential rent I appears because of difference in natural quality of different resources, in environmental conditions, in conditions of exploration that cause objectively different working conditions and different expenses on the production of the same goods in different natural conditions. Appearing on realization as difference between market prices and utmost (for natural resources) production expenses, basic minimal monetary terms of differential rent I methodically should correlate to the expenses on covering objectively larger expenses on fabrics situated in worse conditions than others, on the condition that their production is demanded.

$$R_{d1} = \Delta E_{pr \max} \tag{6}$$

where $\Delta E_{pr \max}$ is the difference in expenses on production of the demanded goods in mining fabrics situated in less comfortable geological and ecology-economical conditions.

And only differential rent II reflects the labor expenses of a nature consumer for rational consuming of nature resources, as it happens to be an additional profit appearing as a result of additional investments in “improving” the natural resource or increasing the efficiency of its use.

$$R_{d2} = \Delta P - \Delta E, \tag{7}$$

where ΔP – additional profit, caused by efficient nature consuming (low-waste technologies, offloading of diversified production etc.); ΔE – expenses on getting additional profit.

Differential rent II, reflecting the real efficiency of nature consuming, should belong to the nature consumer or the subsoil lessee.

Calculation of rent in case of the lease of natural capital is connected with defining of zero difference between all expenses, including ecological, and incomes and payments during a certain period of time. Special attention is paid to the calculation of rent as criteria of efficiency of use of the natural capital.

For its accounting it is proposed to use the annuity method, i.e. full compensation of nature capital farmed by the nature consumer:

$$\sum_{t=0}^T \frac{R_t}{(1 + E_p)^t} = \sum_{t=0}^T \frac{n_t}{(1 + E_p)^t} \tag{8}$$

where R_t – summary rent (absolute and differential rent I) from delivers and consumers – the input stream in some moment of time (t); n_t – summary expenses on using the nature

capital (on reproduction, from consuming and polluting environment etc.); T – the period of renting the nature capital; E_p – comparison rate, which reflects the expected level of average interest on the financial market.

This method, which is used for calculation of traditional cash flows, is a method of calculating the net present value, but, up till now, it did not account the ecological component and the capacity of natural resources to bring unearned income.

According to the rental theory of the value of nature capital, absolute value of net present income will depend on objective conditions: the more of the natural capital is encashed – the larger is the income, the lower are nature consuming expenses – the larger is the profit, and also on a nominal condition: the choice of the rate of discounting.

Annuity method allows to find out the value of annual averaged rent, which goes along with the project of putting the use of natural capital into practice, and the value of differential rent II, which, according to the ideas of market economics, should belong to the lessee-nature consumer:

$$R_{II} = NPV_n = \sum_{t=0}^T \frac{R_t}{(1 + E_p)^t} - \sum_{t=0}^T \frac{n_t}{(1 + E_p)^t} \quad (9)$$

where $R_{II}=NPV_n$ – net present value of natural capital (differential rent II)

So, with $NPV_n=0$, the consumption of nature capital is at least break-even (provides its simple reproduction – absolute and differential I ecological rent). With $NPV_n=0$ consumption of natural capital provides its expanded reproduction and allows nature consumer to gain income. It stimulates the involvement of nature-saving innovative technologies and ecological diversification. With $NPV_n<0$ – the use of the natural capital is loss-making and should be subsidized in case of existing demand on production.

In connection with all foregoing, also for the aims of methodical prove of calculations, we propose a classification of conditions which influence the formation of absolute and differential rent I and II on the inner coal market. Principal directions of redistributing rent on covering relevant expenses serve as a base for methodical prove of defining monetary terms of rent with accounting appreciation as the only source of rent of additional labor expenses.

Depending on the organizational forms of functioning of mining enterprises and administrative cosubordination, absolute and differential rent are accounted differently on different levels of price regulation. But, in purpose of creating funds on full reproduction, prices on production of mining industries should account minimal rental rates, which should go on further redistribution in accordance with reproductive function:

$$P = E_{pr} + E_{ge} + E_{pr_{max}} + E_{ef} = C + R_a + R_{d1} + R_{d2} \quad (10)$$

where C – manufacturing bare cost of production;

E_{ge} – expenses on geological exploration or rate of reproduction per tonne of similar raw mineral resource;

E_{pr} – difference in expenses on the production of the demanded goods between the enterprises located in the worst and the best geological and ecology-economical conditions;

E_{ef} – additional investments of capital which provide extra profit;

R_a, R_{d1}, R_{d2} – correspondingly absolute rent, differential rent I, differential rent II.

important components of the stimulation mechanism. Two main forms of taxation are called stimulating and confiscatory not for nothing. The first one stimulates the development of producing goods and services, while the second one locks it. The bigger amount of profit with the high norm of profit is possible only with monopolistically high prices and the deficit organised by the monopolist on the state level.

4 Conclusion

The confiscatory taxation locks the development of production and protects us from profusion, whilst the monopolists and the officials from the loss of the source of well off existence. The deficit causes a need of distribution, of controlling the actions of the distributor.

Rental mechanism, the stimulating mechanism of taxation, must fit the majority of population instead of individual social groups.

Long-time opposition and so-called differently-oriented branches of economics – economy of production and the economy of the nature consuming – are united by one goal – achievement of the maximally efficient result with minimal expenses of all types of resources, including ecological.

The offered approach to the estimation of natural resources and of rent taxation would allow to increase the stability of system development in a new innovative, technically-technological and ecology-economical essence.

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