New Land Valuation System for an Economy without a Land Market

Aladár Sipos[1]

Abstract: A new land valuation system was developed, consisting of two elements: the *ecological* valuation of land, based on the fact that the natural factors (soil, climate, land relief, and hydrological factors) can be separately valued and the result expressed by a single value, and the *economic* valuation of land, based on the principle of returns to land as a factor of production. The basis for the economic valuation of land is the earning of rent-like income on farms with better than marginal land. On the basis of differences in land rent, 23 such economic districts could be formed, taking in major areas of the country. The new land valuation system accounts for more of the variation in land rents than does the old system, or a system that only uses ecological factors.

Introduction

Economic competition, intensifying both internationally and at home in the intensive stage of economic growth, increasingly demands exploration of the reserves of economic efficiency. A major opportunity to do so is inherent in a more rational use of natural resources, particularly land, where the costs of production are lower than average (or than the international market price) and thus allow the realization of lasting economic advantages, rent-like income.

Questions related to the rational use of natural resources also include the system of measures (standards) of land valuation. In Hungary, the land valuation system in use today was established more than 100 years ago. Its substance is that the net income per hectare of different land uses was determined in the then-prevailing unit of currency, the gold crown. This was a complex indicator that took into account, besides quality and fertility of the land, economic factors relevant at that time (inputs and sales opportunities). But this mode of valuation has now become obsolete. Most criticisms of it concentrate on the fact that the economic factors on the basis of which it was developed have completely changed.

Those values of income and yield (returns) that were true in the last century or in the first decades of the present one no longer hold. The management system in Hungary's agriculture has changed. Cultivation with draught animals has been replaced by modern, mechanized production. Yields have multiplied and former market relationships have completely changed. The structure of production inputs, price system, and relative prices are quite different. Profitability relations have been rearranged.

Soil fertility has changed, frequently even at the regional level, as a result of the large-scale improvements carried out over the last 20 years.

Also, development of soil science has facilitated a more up-to-date system of land valuation. In the old land valuation system, the soil could not be analyzed with modern instruments.

The fact that land has always been and always will be at the centre of economic processes also supports the need for developing and introducing a new land valuation system. The appropriation of land as a means of production is of vital interest to the various classes and groups of society. This is why, even today, several economic and sociopolitical tasks are related to land (e.g., economic regulation, withdrawal of land, expropriation, etc.). In view of the fact that Hungary does not have a land market, these issues can only be tackled by relying on a scientifically founded valuation system.

According priority to efficiency, the relative scarcity of land could be mitigated by increasing the commodity nature of land; e.g., turnover of land among the various sectors (state, cooperatives, and private individuals) and among enterprises could be accelerated and land could be ceded to such productive firms that can better use it. In spite of this, precisely because the land market has to be regulated by the state, one cannot imagine, even in the long run, that the calculated price of land can be replaced by one emerging from market turnover.

Examining the importance of up-to-date land valuation requires referring to that aspect of economic regulation that is related to the system of taxes and subsidies, as well as to the formation of agricultural prices. In Hungary, taxes levied and subsidies granted depend, first, on the quality of land. Belonging to the taxed or the subsidized category may, for some state farm or cooperative, result in additional income or loss amounting to several million forints, essentially independently of management, simply because the state purchase prices of agricultural products have not been set on the basis of individual inputs on the marginal lands. The responsibility of macrolevel managers is great; they decide the criteria on the basis of which individual farms are ranked as to whether to be subsidized or not. This ranking cannot be objectively arrived at if the system of land valuation applied was established more than 100 years ago and has become distorted since then.

New System of Complex Land Valuation

The economic valuation of land means the consideration and qualification—in the framework of a unified system—of a complex system of ecological and economic criteria. Under the new system reported on here, ecological conditions and the economic environment in which economic organizations carry out their productive activities are valued separately. This is the standard (the system of measures) that provides the basis for various economic policy measures related to land. The ecological and economic characteristics of the land are expressed by a complex land-value figure, in points. Thus, the new system of complex land valuation in Hungary rests on two pillars: ecological and economic.

As regards ecological valuation, its end product is the value characterizing the place of production. The theoretical basis of the ecological valuation is that natural factors (soil, climate, relief, and hydrological factors) can be valued separately and the final result of the valuation can be summed up in a single figure into the "value"[2] characteristic of the place of production. This figure expresses the fertility of a given land area as determined by the natural conditions with a number between 1 and 100. The ecological valuation does not comprise any economic elements.

Between 1981 and 1985, first of all because of financial considerations, instead of introducing a valuation system based on the genetic mapping of the soil, the new kind of valuation was applied to the old sample areas, using a system of values of relatively more modest content, but nationally uniform. The value figure for the place of production was adapted to the areas with reference to the limits of quality classes established in the soil classification system.

The land valuation system based on sample areas has to be gradually raised to the level of soil maps, as the soil maps gradually become available. This work has already begun. Nevertheless, until the valuation based on soil maps is performed by establishments, in the new complex land valuation system, the ecological conditions are expressed by value figures of productive areas established with the aid of valuation based on sample areas. According to control computations, they are a more realistic measure of value than the gold crown, and the economic valuation is based on them.

The system and method of the complex valuation of productive land has been established by taking into account several theoretical and methodological ideas.

As regards arable land, the computations were based on 14 crops, while with respect to other land uses the computations were based on seven kinds of fruit and two kinds of grapes, as well as grass and forest. The average cost and income data for 1980-84 were considered.

Taking into account the lessons of related discussions, a system of land valuation based on the principle of yields/returns was worked out. This system uses net returns to land as a factor of production; i.e., how much is the net income from crop production on different lands and how much of it may be attributed to the land itself. The values of output and income were worked out in variants based on basic prices, factual prices, and ideal prices.[3]

At basic and factual prices, a negative land rent was arrived at on the areas of poorer land quality. With a negative or zero land rent, the task of establishing a uniform land valuation system cannot be solved. This is why the solution chosen was to attempt to work out rent-like income produced on farms with the aid of an ideal (calculated) price.

In these computations, the basis for the ideal price was the individual inputs established with average production technology on the worst lands still being drawn into cultivation, in view of the fact that the better quality lands are only available in restricted quantity. The inputs (costs) on the worst quality (marginal) lands were complemented by an income proportionate to costs, corresponding to the national economic average.

The economic valuation of land is based on that rent-like part of income that accrues in farms with better than average land, owing to the quality and situation of the land. When quantifying the rent-like income, the normative demand for fixed and variable assets used in production was deducted from the total income from crop production and the remaining income was attributed to land as a factor of production.

Economic Regions of the New Complex Land Valuation

The delimitation of regions was approximated by analyzing the spatial differences in the rent-like income of farms. The deviation from average income was assumed to be partly traceable back to general economic factors that are not locally characteristic of one farm but are of a more general nature, based on a region comprising several farms.

Methodologically, the delimitation of regions was approached indirectly; i.e., no spatial projections of individual factors were made (this was not possible because of the information base), but the final result of the effects, the income of the farms (more exactly, the spatial situation of differences in rent-like income) was sought.

From the national average land rent belonging to the values of individual productive units, the own land rent of farms with the same ecological value deviates in such a manner that these deviations show definite geographical differences. Based on these differences, 23 such economic regions could be distinguished, which cover major areas of the country. The numbering of the regions does not involve ordering either by size or quality.

By mapping the differences, regular and unambiguous limits of regions were obtained. Delimitation was based on the agricultural area of large socialist farms.

The analyses performed provided a good starting point for judging the differentiation among regions and for assessing the differences among and within regions. The differences are significant in some regions and indicate that the impacts of economic environments are directly observable in the development of enterprise incomes.

According to the logic of computations, the economic (complex) value of productive land within the region is equal to the average land rent belonging to the values of the individual productive units. The rent of lands with the same ecological endowments but belonging to a different economic region is different. The deviation may be traced back to the modifying effect of economic conditions. Several such variants were computed where the impact of the economic environment was restricted (±30 and ±50 percent). The analyses have proved that the new economic values have a greater reallocative effect on farms than the old point system based on the gold crown. Therefore, the effects of economic factors should not be restricted in the new valuation system.

Several such factors were omitted from the system for determining the values of productive units, which, by their nature, cannot be unambiguously classified as ecological or economic, but which still have to be reckoned with when the number of complex figures is determined.

Corrections to values for individual units/farms to be considered include damage due to inland water, air and soil pollution, and outside factors on the land (electricity pylons, oil wells, gas pipelines, railways, etc.) hindering cultivation.

The first three groups of factors causing damage or improving conditions have been nationally assessed by the Land and Mapping Office. Five categories of damage were

distinguished: (1) areas under inland water for 1-4 weeks (during the growing season), (2) areas under inland water for longer than 4 weeks (during the growing season), (3) polluted areas, (4) at most one outside factor per 10 ha that hinders production (oil well, electric grid), and (5) more than one hindering factor per 10 ha.

The extent of damage caused by the correcting factors was determined at the enterprise level according to the kind of damage and its extent.

Determination of the Complex Point Values of Productive Land

The number of complex points of productive land is composed in all large-scale farms of three parts: (1) the values of productive land expressing the combined effect of ecological conditions, (2) the impact of economic factors modifying the values of productive land, quantified by forming economic regions, and (3) accounting for the local correction factors hindering production, which are established at the enterprise level.

The system comprises arable land, vineyards, fruit orchards, as well as forests (the latter displaying particular features from the aspect of valuation). The economic valuation was carried out uniformly on the basis of the system developed for arable land, and also for the other land uses.

Main Characteristics of the New System of Valuation

The potential income-producing ability of productive units farmed under different ecological and economic conditions is expressed by the new order of values in a way better corresponding to reality. Analyzing the system of relations between the factors, the correlations in Table 1 have to be stressed.

Table 1-Correlation Coefficients

Factors	Land rent (Ft/hectare)	Plant receipts from plant production per Ft100 of direct costs
Gold crown	0.66	0.67
Value of productive place	0.69	0.65
Complex points	0.83	0.71

The correlation coefficients prove that the complex points expressing the combined impacts of ecological and economic factors determine the income-producing ability of land areas to a highly significant extent. The difference between 0.83 and 1.0 may be ascribed to the differences in individual management levels (leadership and work organization) of farms.

Notes

[1]Hungarian Academy of Sciences.

[2]In this system, "value" is not an economic term but a category expressing quality.

[3]Basic price means net price receipt per unit (one ton) attained by the farms. Thus, it does not comprise the factors modifying the price receipts under various titles. The actual average sales price comprises, in addition to the net price receipts from the main product, also the items modifying the price receipts.

DISCUSSION OPENING—*Gene Wunderlich* (Economic Research Service, US Department of Agriculture)

In the paper by Sipos, we are challenged to design a system for valuing land without the aid of market prices of land. Prices for both land and the products of land are administered, so decisions concerning allocation of resources must be based on criteria other than decisions of individual users of the land.

The stated purpose of the new system proposed in the paper is to improve efficiency; i.e., to better allocate nonland resources to land. Other purposes such as regulation and expropriation are mentioned, but the primary purpose is apparently resource allocation.

The proposed system of evaluation is presented as a replacement for a 100-year old procedure. However, the author fails to describe the original purpose of the ancient system. Can we assume that it was for taxation? Some additional information on the history and function of the old system would have been helpful.

The proposed valuation scheme has two components: (1) an assessment of the physical characteristics of the land and (2) an economic feature for converting physical yields into economic returns. The function of the "returns" is to provide a numeraire or index to the many diverse physical measures. It performs one of the functions of price in a market-oriented system; i.e., to provide a common basis for comparing different commodities or resources.

The values are determined by calculating net returns on various classes of land. The procedure resembles budgeting by enterprise and by environmental group (soils, slope, etc.). The land classes are apparently determined by no-rent land; i.e., land for which, after all other costs are paid, no residual remains. At this point, the idea of an "ideal price" for the land arises as the difference between average quality and quality of a particular location. The economic valuation of land, according to Sipos, is based on "rent-like" income associated with farms having better than average land. It appears to emulate Ricardian rent. The pattern of these "rent-like income differences" becomes the basis of regions. The 23 regions become the aggregative planning regions for state or cooperative management.

Are the values simply net revenue figures from budgets based on physical yield estimates? If yes, then I must ask why we assume that actual performance of a farm will be the same as its theoretical norm? What in the scheme will induce managers to neither exceed nor fail to achieve the norm? The issue is not the prescription of some calculated optimum or some abstract value of "rent-like" income, but performance of the various production units. In other words, we have here a theoretical measure of capacity, not necessarily an indicator of performance.

For the objective of achieving efficiency, why not supply the technical parameters such as soil, slope, and moisture to the managers of various production units or the state or cooperative farms and allow them to bid for the land? They would quickly create a market-like demand for land and generate rental payments to the state-owned lands. Rentals would perform the allocative function directly.

Open bid rentals would perform an additional function. They would return to the economy the value inherent in land. As Hawtrey told us a generation ago, the production value of land is its "cost-saving efficacy"; i.e., the value of labour and capital for which it substitutes. Therefore, all return to land above that necessary for transfer and information is economic rent and may be returned to society or economy that created its value.

Finally, the problems of valuation and administered prices are not unique to Hungary or other centrally planned economies. Even in market-oriented economies such as the USA, empirically specifying a land value is problematic; e.g., (1) not all transfers are under market conditions (in the USA less than 40 percent of the land is transferred by market sales), (2) observed prices may reflect special credit terms, (3) some land is purchased as a final good, not a productive resource, and (4) taxes and subsidies affect values.

GENERAL DISCUSSION—*T. Haque, Rapporteur* (Indian Agricultural Research Institute)

The points raised on this paper were: (1) what procedures are followed in evaluating the land prices when factor prices are administered in a country like Hungary?, and (2) would the results vary significantly as a result of any change in the procedure?

Sipos replied that his economic valuation of land was based on "rent-like income." Since the question of land valuation has not gained much importance in Hungary, looking into its economics is not really needed. He also agreed that adoption of different procedures could lead to different results.

Participants in the discussion included S. Gabor.