Profitability Analysis for Agricultural Investment Projects

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Abstract. In agriculture production is based on a process both economically as well as the biological one, the work results are influenced, more than any branch of economic, natural and climatic conditions are subject to higher risk and permanently. Due to the features of production in agriculture, we believe that it is necessary such as performance agricultural units to be assessed under a system of specific indicators. The correct assessment units are closely related agricultural economic-financial investment in agriculture. In the following we present and analyze a complex system of specific performance indicators of the extremely for assessing agricultural units.

Keywords: profitability, performance indicators, agricultural investments

JEL code: E22, Q14.

1. State of knowledge in this field

Etymologic, the profit has its roots in Latin, from the verb *proficere,* which means *to progress, to give results*. To the profit notion was given much attention in all thought systems.

Thus, mercantilists (J. Bodin, Th. Hurnn, J. B. Colbert) considered that "the purpose of any lucrative activity, including trade is the profit which is obtained in the process of merchandise movement through the money intercessions as a result of the difference between the sale price and the buying price (smaller)."

Economist's like Fr. Quesnay, A. R. J. Turgot, rejecting the mercantilist conception regarding the roots of profit in trade, they thought that the plus of products and therefore of value over the expenses incurred can be created only in production, more precisely in one of its main branches, in agriculture.

The classic A. Smith thought that profit is the owner of capital income because, "its size depends, not of what someone might call the employer work, but by the size of capital available to the employer".
For K. Marx, the profit is a form of manifestation of the added value , as part of the created value by the employees workers that other social groups are taking it (the capitalists employers as profit, the bankers as interest and the owners as a land rent).

Nationally it is defined and interpreted in various forms. The notion of profit is seen, accepted and understood differently by economists because of its global concept, as a result between the economic effort (the production cost) and the resulted effect in income. For profit, total income must be greater than total costs, in all situations.Watching so, "profit can be defined as a surplus of income over the cost", it is „the positive difference between income earned by selling goods made by a trader and their cost, considered as an expression of economic efficiency".

Profit is „a component of the selling price of goods or services provided by the company, their final price is determined by acceptable profit margin".The common goal of all economic agents is the profit motive.Running the entire production process, market research, obtaining price desirable depending on market demand means an account of uncertainties or risks. [5]

From this point of view, profit „is a consequence of risk, a reward that a trader can receive for his capital risk, it is the result of the future provision with more accuracy than done the majority of other competitors. In this regard, can profit be viewed as „a compensation of the entrepreneur for the risks they may have in carrying out economic activity, evidenced in capital loss".

Profit is a positive real value resulting from economic or financial and monetary processes - combined with the market demands, the value accepted by both entrepreneurs and state for both parties

representing the main source of funds that support the use and development. Whatever the form of profit, it expresses the total income from economic activity in progress, he was both the result of progress and its factor. Profit represents one of the most synthetic indicators of economic activity of enterprises. It synthesizes nearly all of its economic activity on: supply, production, sales and results from other activities. Profit analysis of the company studies the dynamics and structure of the overall profit, highlighting the activities and cost- effective products, emphasis and capitalization of internal resources to increase their permanent return. Reflecting the company's efforts to increase economic efficiency, profit is a very useful indicator for assessing economic activity, but not enough. In accordance with the annual planning and economic-financial records, profitability indicators can be grouped like this:
Indicators reflecting the net profitability of a farm - they allow an analysis of profitability only in the total activity of the company:

Net profit calculated as the difference between gross profit and income tax. He remains at the disposal of the economic unit to be allocated as intended;

Net rate of return on total farm holdings, which are determined according to the resources consumed (total expenses), total earnings from work and resources used, considered that effort (labor, land fund, assets, current assets, capital). Indicators that reflect farms gross return. They allow an analysis of profitability in both total activity level of the company and the types of activities or the entire chain of organizational structures, and each product

- **Gross profit** calculated as the difference between total revenue and total expenditure without inclusion „of the unit tax".
- **Gross return** rate calculate as the ratio between gross profit and various resources taken into account(including income unit)

This system of indicators to identify organizational structures, business areas and products where there was an unfavorable dynamics, giving the possibility of taking some measures for increasing the profitability of the entire financial – economic activities.

2. Economic activity in agriculture

Unlike industry, the agricultural production process, intervening factors, which determine peculiarities in the use of labor, means of production and of labor . By characteristics such training, the existence and development of specific factors that act on the process of agricultural production , land, plants, animals, climatic condition, print special features' in terms of development strategy but also in term of production process with the two sides, technological and economic, causing some features effecting the economic analysis methodology.

Profitability analysis of these features in agricultural holdings will be listed below. Land- based agricultural production, the nature of a particular factor of production which gives them exceptional importance. Economic activity in agriculture is directly and indirectly related to land, as the main means of production per unit area, the nature and allocation of production factors, the cost of agricultural farm products and this profitability. Compared with other means of production, land has a number of traits that give them a specific role in agricultural production:

- is a substitutable factor of production or hard substitutable;
- is limited in scope but not limited to productive power with the ability to increase their fertility through investment;
- can not be copied and is irreplaceable for agriculture;
- as a means of production can not walk, to print the agricultural process and dependence of a particular space and some structure and organization of production;
- rational land use wear but not improve their productive power.

Land can be used intensively or extensively, reserves targeting volume production profitability growth rate depends decisive proportion of the limits however required of intensive side the of the new concept of sustainable development. Also need to use in analyzing the profitability indicator, benefit to 100 ha" it constituter the main means of agricultural production. Land rent is the net income created in agriculture, where land remunerated factor. Rent calculation for determining the amount of land required land lease cost factor for calculating agricultural tax and support policies for grounding income farmers. Interdependencies between price, cost, profit and rent are very close. Without calculating every economic category we cannot determine the levels of the others. The economic evaluation of the land included in the agricultural exploitation patrimony is necessary when calculating the amortization and when including this in the costs, all these having influence upon the profitability of the exploitation (the price of the land being directly proportional with the profit per hector and inversely with the rate of interest). [6]

For the modern management, to buy, to farm, to lease or to rent land is a subject for economic analysis and these actions must be evaluated through the costs of production which they engender on a

long term. The capital from agriculture has numerous characteristics and features, which must be taken into account when analyzing profitability, in the process of taking and implementing decisions. The fix capital (under its three forms of data: land, machinery, livestock breeding and working) has long life and is limited. He also has a heterogeneous character in space and on types of agricultural units. Free cash flow is used in a production cycle, it can be assimilated with intermediate consumption (seeds, planting material, feed, fertilizer, chemicals, water, livestock production). Its characteristics are approached differently on component elements taking into account the importance of the rotation speed growth and the appropriations necessary to obtain a unit of added value.

The production structure is expressed by the proportions of the production costs generated by combining and merging branches, in particular by the proportions between the fixed and the variable costs and the impact of these proportions on the revenue or gain of the farm.

The production structure can be:

1. Extensive, (characterized by the predominance of cereal crops in the area under cultivation and production of goods and other crops that exploit earth weak), which leads to farms to increase in order to achieve high income areas.

2. Intensive, (characterized by high share of livestock in total agricultural production or the high percentage of intensive crops in vegetable production) - in this case resulting higher revenues through the allocation of more variable factors per hectare and per animal.

The organization process of new production structures in our country is made uneven in time and space, on forms and types of agricultural units: on industry or product, on organizational levels (exploitation, farm, sector), the phases of technological process and area specialization. Along with the deepening of specialization the diversifying of specialized units occurs, not only by industry or product but also by phases of the technological flow.

The complex profile of a agricultural undertaking (vegetal, livestock and industrial) and the organizational structure of these units (farms and sectors, departments) impose the following of the contribution of each branch of production and organizational links to the formation of enterprise profitability.

The reserves of the increased profitability on the entire company depend also on the profiling and rational specialization of the unit, especially on the harmonious combination of the animal to vegetable production. Structural interdependencies influenced by random character and the specific impact of resources used in the context of increasing competition, requires a systemic approach of structural elements of the agricultural company in order to identify optimal solutions for operation in free market conditions.

The production system is unique not only locally but in every agricultural farm thanks to the accidental nature of the harvest, the necessity of keeping the biological balance, the multiplicity of economic and field conditions. Consequently, the management of resources and agricultural produces gains its own particularities among other economical fields and requires distinct tackling.

Choosing the production system is the basis of the production process programming during its every stage. The implementation of an advantageous commodity output structure, on receivers, on delivery time and on quality categories as well as the delivery to state fund of large amounts of products on each hectare and head, entail the medium production price boosting, as a backup of the profitability augmentation of commodity.

Farming holds an important place in the agricultural production, being the determinant for valorizing the landed capital and the exploiting capital. The economic concernment of actual living work appears from the fact that it holds a heavy weight in the production expenses of the agricultural exploitation arising social aspects especially among family establishments, where it represents an unpaid constant charge. The pattern of correlative implication in benefit and monthly costs alongside other synthetic markers, the production and the gross VAT rate in agriculture play an essential part because it embodies the main element which determines the quality of life itself. The monthly cost on the work force influences in inverse ratio both the overall production and the gross VAT rate in agriculture.

The long production cycles (the duration of production processes being ten times longer than the other branches), the field conditions influence, the seasoning characteristic of using natural and human resources, defined by the disparity between the working hours and the time of production, inflict the close watching of productivity in dynamic.[5]

Within the agricultural farms primary processes take place alongside with secondary ones with major implications in managing and organizing the farm. Here, the technological processes entwine with the biological ones, they even overlap, which rends a fundamental particularity which should be taken into consideration when economic- financial and monetary politics decisions are enacted. Therefore, when functioning with living organisms which multiply, develop and in the end produce (after a series of

biological modifications), those costs will be later on redeemed, once the production is capitalized and commercialized.

The uncertainty and risk yield which exist in agriculture, should also be considered, the natural ones- drought, flooding, freezing, diseases, pests- and those predictable- soil, relief, climate, which determines a considerable effect over the acquired production, which may vary according to the nature of production.

The implementation in agriculture, of a productive management, as in any other branch of national economy, is possible only by perfectly knowing the evolution of the manifold economical-financial phenomena during one year of activity, its variation in regard to anticipation and in dynamics, as well as the correct diagnosis of the period. Given these information, the forthcoming economic- financial projects of investment in agriculture may be settled. To achieve this principle is necessary to have technical and economic information, social, legal and ecological about each version and its structural elements. Efficiency calculation without detailed information can not be properly.

3. Criteria used in the calculation and analysis of investment efficiency in agriculture

Investment decision based on the calculation of efficiency indicators, calls for analysis of indicators reflect the criteria in each project version. Decision-making in practice, to assess investment projects using the criteria "minimum effort" and "maximum effect".

First criterion is imposed by insufficient investment resources to the increased requirements for upgrading or re-development of fixed capital in the economy, and the second, which aims to maximize financial results of principle of optimality and continuous growth in demand for material goods and services.

Outside these two criteria, which have an absolute expression, relative criteria are also used, resulting in reports that may be established between the effects and efforts, such as:

- further maximize the effects obtained from a unit of additional effort
- minimize the efforts of investment allocated to a unit of additional effect

In practice can used other criteria provided they are designed in a simple form and can be expressed by a mathematical relationship to one or more indicators. The economic agents in agriculture for evaluating investment projects required criteria such as : minimum total costs updated, which include both investments and operating costs of the facilities; maximum net income or cash flow to date, net income more than updated to an updated RON investment. The industry can use criteria, global maximum, minimum investment allocated.

4. Particularity in analysis of investment efficiency in agricultural projects

For determining income growth is necessary to know the economic effects achieved in the area arranged before and after investment. Crops in large economic effects can be obtained through land reclamation works are materialized in crop production growth in each plot and the total are, compared with the situation before fitting, and elimination of damage that occur due to deficiencies in the current situation shows that land (appropriate category of works: excessive humidity, non-irrigated areas, saturated, clay, degraded pasture etc). [3]

The increasing of the crop production can be achieved both by extensive areas due to the area growth by attracting unproductive lands in the agricultural circuit or by increasing arable land based on the ameliorative works performed on the low productivity land and by intensive by increasing production per hectare .

In what it concerns the damages that can be eliminated by making investments, they are crop losses, degradation of agricultural buildings, roads, construction of housing. A proper determination of the efficiency of investment in these projects imposes the including in the calculation of all effects arising from the project. Any omission will lead to lower efficiency and, thus, to a wrong decision. If there are no calculation problems in what concerns the annual production bonuses, because they can be determined precisely, problems often occur at the results obtained by eliminating damage.

A feature of the calculation and analysis of the efficiency of investment in agriculture, especially of investment for hydro ameliorative works, is the investment efforts made outside the investment process. Thus, to achieve the effects mentioned above it is necessary to make efforts which contain beside the initial investment allocated to carry out land improvements (eg irrigation) also subsequent investments which are to be done later, after the operation of the project, consisting of agro technical expenses, expenses for ameliorative and agro -ameliorative works. During the exploitation period of irrigation works, for example, they increasing the ameliorative costs and reducing the net economic effects, as follows:

- inlet channels are clogged and the flow decreases and therefore cannot be applied to crop irrigation scheme in the project;
- part of the channel changes its slope and therefore not reach the volume of water provided;
- replacement of worn watering plants;

All these additional costs should be considered in calculating the efficiency indicators. They should be compared with the economic effects achieved, that additional net income and savings achieved as compared to the previous investment. The current methodology for economic-financial investment projects do not take into account the investment efforts made outside the investment process, specific situation for the agricultural investment projects.

Knowing the total investment (I_t), the annual growth effects (ΔE_{ff}) and duration of functioning of the development work we can determine the effectiveness of the project after the general relationship. This way of calculating the efficiency of investments is reflected in other economic sectors, but it occurs most often in agriculture, being a feature of projects for hydro ameliorations. This explains the fact that in determining the effectiveness of these types of investments it is always used the method "with and without" investment project. Its application is made, but in a different context compared to other industries, given the long implementation period and adaptation of works subject of the hydro amelioration works (the 15 years).

If the case of a probable evolution "without" project, the calculation should be based on the current situation, namely the structure, employment, degree of mechanization, etc. existing and should take into account the existing and potential annual increases in production and as a result of improvements which related to an investment project (the possibility of using certain varieties, improved, fertilization, proper execution of works, all of which can lead to annual yield increases of several percent). Calculation of efficiency in the situation without project should not be static but dynamic, than if the calculation is made in the form "with" project. [3]

In the situation "with" project the likely development is conditioned primarily by financial and technical resources allocated. Irrigation, for example, is very expensive and is done in several phases over a long period of time. Thus, in a first phase water has to be brought to the farmer's property (physical or legal person) and arranged the land for irrigation. In the adapting phase the structure may change. After these works that are generally borne by the state, and then to be recovered through fees placed on water use, private agencies run a series of activities and invest in works such as:

- preparation of land for irrigation (leveling, moving, buying mobile installations where sprinkler irrigation is made);
- increase the revolving fund to purchase fuel, pesticides, fertilizers and supplements to the salary fund;
- development of infrastructure (silos, warehouses, sheds, machinery increased mechanization of crops).

Achieving these private investments usually requires a long period of time. Also, revenue growth is conditioned by other factors such as the human and financial that must take into account when we calculate future income of the operation and evolution of the horizon analyzed. Should also be noted that, in general, the period that elapses between fetching water and its use is dependent on the degree of training of farmers in achieving both irrigation and on its results. The adaptation period can last 3-4 years which will increase yields and revenue forecast. Of course, this period depends on the crop structure. For example in horticulture technical adjustment period is 10-15 years and 15-20 years in animal husbandry.
An important factor on which the period of land reclamation projects reach parameters designed to income is the financial factor. Adaptation will be shorter if they have the required funds in time and at the required level. [5]

Size of the investment period and the actual manifestation of adaptation to achieve desired effects are therefore calculated in a dynamic manner depending on resources available, the possibilities of capital accumulation, the agro-technical requirements.

Determining the efficiency of investment in projects for new irrigation works (as well as with other land improvement works) must be strict compliance with methodological elements for calculating the indicators. The most important of these elements are:

1. Equivalence perimeter areas studied for both situations - and after the current arrangement. We believe that the gross floor area includes planning, land is cultivated with effectively and surface irrigation works (roads, sewers, etc.).

2. For lands in possession of several categories of owners (individuals, associations, companies etc), computing elements such as average yield, the amount of investment, need to distinguish the categories of owners.

3. The medium productions considered, for both situations, have to be normal meaning those which could be obtained in normal circumstances. Conjuncture productions will be cut out from

calculations (natural calamities situations, etc.). For a better insight regarding the efficiency, it is highly important to predict with certainty the productions which will be obtained from the watered terrains by using agro-techniques and optimal watering systems. The structure of the agricultural crops in the current situations is established as an average of the last three years of the analyzed surfaces (and effectively cultivated) for each crop. Regarding the crops structure after improvement, this is set by the land owner and must ensure the demanded conditions by the watered production, such as:

- To be classified in surface productiveness categories (for example alfalfa and clover crops, with high efficiency must be assigned on dewatered-drained surfaces);
- High-efficiency crops such as those which can be directly sold on markets, must be located on the areas accordingly to merchandise transportation expenses;
- Crop rotation;
- Double-crop execution after early harvested crops (pea, wheat, barley, etc.).

Through double-crops green-mass is ensured for the zoo-technical sector and they also help in avoiding soil saturation, which is frequently met in situations when early harvested surfaces are not covered with vegetation in high-temperature months. Double-productions must be realized on at least 80% of the watered surfaces initially used for early crops.

4. Included in vegetal production evaluation, besides main production, are double-crop production and secondary production, which has to be considered due to its high value and the importance it has for the zoo-technical sector. Secondary production is also considered in generated crop costs calculations (wheat, corn, etc.) and also in their value calculations.

In establishing production value, the same prices will be used in both cases so that the results are not influenced.

Due to these particularities of the investment process in agriculture, it is necessary to consider in the calculation of the production increase, after watering improvement, that this is also determined by the following changes:

- The growth of arable and effectively cultivated surfaces, as a consequence of the unproductive terrains transformation or those poorly productive in normal terrains;
- Agricultural crop structure improvement, due to the growth of surfaces cultivated with plants which, in watering conditions, realize large productions and a high efficiency ;
- Hectare productions growth, for all crops, as an optimal agro-technical applying consequence and watering system;
- The growth of the surfaces where double-crops are realized.

5. The investments considered in the efficiency indicators are those which create the total increase of the economical effect. As a consequence, if the general estimate of the project does not include all the investments, the projector must calculate them and add them in the total investment. For example, newly watered perimeter predicts the plantation of an orchard, and the specific investment of the orchard is not included in the general estimate of the watering works, this must be taken into account in the efficiency calculation because it too contributes to the economical effect increase registered in that specific perimeter after improvement. Also, in this case, in the efficiency calculation, territorial organizing investments must be included (road access), as well as equipment, installments and depots endowments of the holdings, necessary fir the development of the production process in the newly watering system created conditions, so that the expected effect increase could be realized. In the same manner should be preceded in the situations of removing reeds, grubbing, etc. Which are necessary on small surfaces and dispersed all over the area, if these haven't been proposed by the project manager in order to improve the use structure and to obtain normal crops.

5. Conclusions

It results that in the total investment related to a new objective for irrigation, for vegetable production, must include beside the investments to the land reclamation works included in the general quote also the no included investment, investment without which we cannot obtain the growth effects, as well as the credits interests. The whole investment is deducted to all land owners and insurance sources.

In the efficiency indicators calculation we must take into account also the exploitation annual spending growth generated by the economic growth effects which, in the complex case, it is divided into the following categories.

The agro technical expenditure growth is composed by the growth of expenditure to:

- Seed cost;
- Mechanization works cost;
- Soil fertilization cost;
- Workforce cost;

- Amortization cost for machinery and their own transportation;
- Other agro technical expenses.

The agro technical expenditures are calculated for the present situation at the level, of a normal technology, and after the appropriation, based on a new technology.

The ameliorative spending growth is composed, in the complex case, of expenses estimated to the works existing in the general quote and to other works that were not included in the release, meaning all the investment expenses which take us to obtain the economic effects after appropriation. In the case of new irrigation design, the ameliorative expenses are composed of:

- The whole cost of water for irrigation composed from th expenses made for amortization, repairs and maintenance at the pumping station related to the analyzed investment, the cost of electricity, salaries, the cost of the hand labor used for watering, the amortization cost, repairs and maintenance related to the other elements of the irrigation system;
- The expenses for the station of evacuation of the water excess, if th evacuation is being done through separate station;
- The amortization cost, repairs and maintenance for the investment made in the works of drainage on areas cu excessive humidity dispersed over the watered perimeter;
- The value of the credit interest rate.

The agro ameliorative expenses growth, these are expenses made in some cases for doing works on small surfaces and dispersed with excessive humidity, acid, clay etc., as supplementary fertilization, salty soil washing, their cost being established for thousands of lei every year. The growth of the total economic effect obtained in the appropriate perimeters is the result of the investment made in the hydro ameliorative works and of the supplementary expenses registered in the exploitation period of the appropriation works. It is expressed by the indicator of the efficiency coefficient of the entire investment, which shows how many lei growth of economic effect is obtained at the level of a thousand RON investment.

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