

***ECONOMIC AND LEGAL PRINCIPLES OF
ECONOMIC GROWTH IN THE POST-CRISIS
PERIOD***

Monograph

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**SECTION III
MODERN TRENDS IN THE DEVELOPMENT OF THE AGRO-
INDUSTRIAL COMPLEX OF UKRAINE**

3.1 Investment activity of agricultural enterprises and methods of evaluation of its efficiency

To create a material and technical base, the acquisition of intellectual property and hiring labor, the organization of new or further development of existing production, the entrepreneur needs financial, material and labor resources.

The purpose of spending such funds and resources is to obtain by the entrepreneur, their group or the state a certain part of the profit or to achieve social results.

Investments should be considered as all kinds of contributions in the organization of new enterprises, the formation of growth of fixed and working capital, the creation of non-inventory objects and the acquisition of intangible and financial assets in order to make a profit or achieve social results. Investing is a conscious interaction of the investment process and investment policy, which creates real capital.

Regarding the terminological basis of this problem: the concept of "investment" comes from the Latin word "invest", which means "dress", "contribute", "endow", and in English and German literature, this term is transformed into investment as an contribution into the fixed capital in order to further increase it.

In the most wide understanding, investment is an contribution of capital for its growth. In this case, the capital increase should be sufficient to compensate the investor for abandoning the means of consumption used in them in the current period, to reward him for the risk and to compensate for losses from inflation in the future, and in general – by the source of increase of the capital with the aim of his highly profitable use.

Providing of development of agricultural production on the basis of intensification of investment activities has considerable differences from other industries of pertaining to national economy complex.

In most production industries of pertaining to national economic complex, the problem of investment activity has two directions of manifestation: expanded reproduction of working capital (increasing the mass of fixed and circulating assets of production) and improving the quality parameters of tools. A choice and adjusting of desirable quality of descriptions of the means of production are controlled here.

In agriculture, in addition to these two areas, investment and innovation activities are preceded by the most important and industry-specific area, due to the fact that the main means of production here is land, biological means of production and uncontrolled (stochastic) factor – climatic conditions. Land resources (as capital) are limited, they cannot increase arbitrarily. This determines the specific features of the target direction of intensification of agricultural production, and

hence the content of investment, which are as follows.

In non-agricultural enterprises, land is only a spatial base of production, which is not associated with the process of intensification. The intensification itself is a fully controlled process, the content of which is to invest in perfection and increase the technical and technological potential, which is fixed by the dynamics of the asset balance. This potential directly determines the efficiency of production (functional connection).

In agriculture, the process of intensification, first of all, is to improve the quality of land as the main means of production of natural origin – to increase its productivity and fertility. Investments by target are systemic here, and their dimension to increase production capacity is not fixed by the growth of the balance sheet asset.

Due to the fact that land is not only a prerequisite for human life, but an indispensable factor in agricultural production for their food supply, the regime of state control over its efficiency and targeted use has recently been strengthened, and certain restrictions on land management have been introduced. That is, the type of land ownership is transformed from an absolute right to a limited, regulated right. The landowner disposes of the results of land use almost completely, unless he has voluntarily limited himself to the relevant agreements, in particular on lease, etc.

Other areas of investment activity of agricultural enterprises in general, as well as in other industries in terms of content are technical and technological. They have a specific difference, which is that investment in the development of technologies in agriculture, in addition to the conventional content, is also aimed at reducing dependence on fluctuations in climatic conditions, id est the action of stochastic factors.

In addition, there are differences in the nature of the improvement of tools. Thus, in agriculture only one part of the tools is represented by technical means of production; the second (significant) – living organisms (plants and animals). They cannot be improved by design and current production, but by changing their biological nature, using the methods of genetics and selection (breeding of highly productive varieties of crops and animal breeds, or hybrids), which is difficult to regulate and time consuming. Acclimatization of foreign highly productive varieties of plants and breeds of animals in order to adapt them to the conditions of enterprises also takes a long time, and is often impossible.

Thus, investment intensification in agriculture is a more complex process than in other industries and less dependent on the business entity.

Sustainable development of agricultural production on the basis of the investment model, as already mentioned, requires a radical renewal of technical means of production of the entire industry, that is, a task that goes far beyond a particular business entity. Given the significant loss of production capacity that occurred in the previous period of economic depression, this task is to implement large-scale measures to replenish lost and worn out means of production, combined with their modernization and optimization of the structure of the warehouse by

productivity and compliance with modern advanced production technologies.

Implementation of investment projects of an agricultural enterprise requires a certain amount of financial resources. The company's own investment resources are formed by: net profit of the enterprise, which can be used for investment activities; depreciation deductions for the full reproduction of the value of fixed assets of the enterprise, as well as its intangible assets; proceeds from the sale of disposed or unused property; temporarily free balances of special purpose funds.

Regarding external financing, it includes two types of investment resources: borrowed and attracted. Borrowed sources of investment resources are represented by various forms of financial resources based on credit relations between their owner and the company. These include: long- and medium-term loans from banks and other financial institutions; bonds issued by the enterprise; targeted loans for a specific investment project; leasing financing, etc.

The fundamental issue of solving the problem of creating and maintaining a strong material and technical base of rural producers is to create the interest of potential investors in expanding investments in the domestic agricultural sector of the economy. In this regard, various methods of assessing and justifying the effectiveness of investment projects in the agro-industrial complex are of particular importance.

Efficiency issues are key for any business, including agriculture. Uncertainty about future business conditions and their constant change, the presence of significant risks, the need to attract a variety of resources, as well as competition and other factors, determine the complexity of efficiency issues for comprehension and evaluation. However, they should be considered in all cases, as lack of efficiency can lead to complete or partial loss of business. Business and inefficiency are incompatible.

Determining the effectiveness of investment – an important area of research in any area of the economy. The choice of investment valuation methods to be used for each industry is an important task for economists.

The most important conceptual requirement and initial condition for improving the efficiency of investment is the use of adequate methodologies for its evaluation as a first step in determining ways and means to increase investment returns at all levels (individual object and direction of investment, enterprise, industry), choosing the right investment alternative of the project, which is a prerequisite for reducing the risks of financial and economic activities and increase its effectiveness.

Given the multifactorial nature of production in the agricultural sector, economic efficiency assessment should be defined at three levels:

- micro-levels – in terms of effects, costs and factors of a particular agricultural enterprise;
- meso-levels – according to similar consolidated indicators on the set of homogeneous enterprises of a particular region;
- macro-levels – according to the results of production in the country as a whole.

According to Kisil M.I. “efficiency is a general economic category for any type of economic activity. It is determined by comparing the economic result (business benefits) with the cost of achieving it. This fully applies to small, medium and large businesses in rural areas that operate in order to maximize their economic and other results and minimize the costs associated with obtaining them”¹¹. When building a system of indicators of economic efficiency of investment at each level, it is necessary to take into account the principles of comprehensive reflection of causal links between costs, reflecting the used resources of production and all types of investment effect.

Another requirement should be the all-encompassing analysis, which would allow to investigate the problems of investment efficiency in the vertical “investment project – an economic entity or their group – industry at the regional and national levels. The implementation of these principles will allow to organize the analysis on the basis of a cross-matrix of assessment levels and investment results, which is given in table 1.

Table 1 – Matrix for evaluating the efficiency of investments of agricultural enterprises²

Level of assessment	Direction of performance evaluation	Economic		Social	Ecological	Integral effect
		real investments	financial investments			
		Entity interested in the results of the evaluation owners / management / employees of the enterprise / population / local governments / public authorities				
investment project or measure of economic activity of an agricultural enterprise		<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>
business entity or group thereof		<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>
regional level		<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>
national level		<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>	<i>indexes</i>

The filling of the matrix tapes with quantitative characteristics (tab. 1), the directions of evaluation and its levels may change depending on the tasks of the analysis. However, practice shows that it is necessary to consider the alternatives of entities that may be interested in the results of the evaluation of investment efficiency. Depending on this, the indicators used in the analysis process change. Thus, the establishment of the necessary indicators for evaluating the effectiveness of investments is at the intersection of three planes: the subject of evaluation, its level and directly (depending on the type of investment result).

The methodological content of the matrix also depends on the tasks of analysis and qualification of the performer. Since the characteristic feature of most

¹ Kisil MI Theoretical and methodological principles of assessing the effectiveness of agribusiness / K.: NSC "IAE", 2015. 36 p.

² Kuzmin E.S. Methods for determining the efficiency of investment in the dairy industry. *Scientific works of Kirovograd National Technical University. Economic sciences*. 2012. Issue 22. URL: [http://www.kntu.kr.ua/doc/zb_22\(2\)_ekon/stat_20_1/44.pdf](http://www.kntu.kr.ua/doc/zb_22(2)_ekon/stat_20_1/44.pdf) (access date: 24.10.2021)

agricultural enterprises is the diversification of products, as well as the ability to invest in the creation and maintenance of raw materials, it is necessary to calculate the integrated effect as a set of effects (economic, environmental, social), as a result of investing in different types of economic activity within the agricultural enterprise, and the cumulative effect on the links of production of raw materials and promotion of products to the final consumer.

Depending on the basic principles of evaluating the effectiveness of investment, a number of methods are used, which can be divided into three groups:

- traditional (static) evaluation methods;
- assessment of effectiveness of financial statements;
- evaluation of efficiency based on the value of money over time (dynamic evaluation methods).

Traditional methods of determining the effectiveness of investment in Ukraine have been used for a long time. Today, they are used in parallel with newer methods of determining efficiency based on the value of money over time. Assessing the effectiveness of investments by traditional methods involves comparing the cash income from the project (that is positive cash flows) with the costs of its implementation (negative cash flows). The factor of changes in the value of money over time is not taken into account. Traditional evaluation methods involve the definition of the following indicators:

1. Efficiency rate

$$ER_y = \frac{\overline{CR}_y}{\sum IF} \quad (1)$$

\overline{CR}_y – average annual amount of cash receipts;

$\sum IF$ – the total amount of invested funds.

For a project to be considered effective, the efficiency rate must be greater than one. When comparing several investment projects, the optimal one is the one where the efficiency rate is higher.

2. The inverse of the efficiency rate is the payback period:

$$PP = \frac{\sum IF}{\overline{CR}_y} \quad (2)$$

The payback period of the project investment should be as short as possible.

The advantage of traditional indicators is their fairly simple calculation, but they also have a number of disadvantages. The main one is that these methods do not take into account the factor of change in the value of funds over time. This can lead to a situation where it will take more time to return the real value of the invested money. Therefore, in a market economy, traditional methods of assessing the effectiveness of investment can be used for short-term projects, when the probability of significant fluctuations in the real value of money is small.

Evaluation of investment efficiency according to the financial statements involves determining the indicators of balance sheet and net return on investment. Balance sheet return on investment is determined as follows:

$$ROI_b = \frac{\overline{AI}}{\sum IF} \cdot 100, \quad (3)$$

\overline{AI} – average annual income.

Net return on investment is determined by the formula:

$$ROI_n = \frac{\overline{AI} - P_t}{\sum IF} \cdot 100, \quad (4)$$

P_t – tax and interest payments.

The essence of these indicators of return on investment is the same as in other indicators of profitability. The criterion for selecting an individual project on the balance sheet or net profitability is to maximize these indicators.

The next group of methods for assessing the effectiveness of investments are methods that use discounting, which involves bringing future cash flows to the present value of money. At the heart of the theory of the value of money over time is the proposition that the real value of present and future goods is different. At the same time, the costs of project implementation are usually stretched over time, and revenues from the project are often received only after its completion, incurring costs. During this period, especially if it is long-term, there may be circumstances that will cause changes in the value of money, especially inflation. That is why when analyzing the effectiveness of investment in market conditions, it is recommended to use methods of assessing efficiency based on the value of money over time.

Methods for assessing the effectiveness of investments, in the calculation of which discounting is used involve the definition of the following indicators:

- 1) net present value of investments:

$$NPV = \sum [R_k : (1 + i)^n] - IC, \quad (5)$$

$P_1, P_2, P_k, \dots, P_n$ – annual cash receipts for n-years;

IC – initial investment;

i – discount rate;

$PV = \sum [R_k : (1 + i)^n]$ – the total amount of discounted revenues for the project.

This method of investment analysis, which is based on determining the value obtained by discounting the difference between all annual outflows and inflows of real money that accumulate throughout the life of the project.

In case $NPV > 0$, the project should be accepted for implementation; if $NPV < 0$, the project should be rejected because it is unprofitable; $NPV = 0$ – the project does not bring any profits or losses. When comparing several projects, the one with the highest net income is selected.

- 2) return on investment index:

$$PI = \sum [R_k : (1 + i)^n] : IC, \quad (6)$$

This method is an extension of the previous one, however, in contrast to the NPV, the PI is a relative value.

If $PI = 1$, it means that the return on investment exactly meets the rate of

return. If $PI > 1$, then the project is profitable, and, conversely, $PI < 1$ – the project is unprofitable.

3) internal rate of return:

$$IRR = i_1 + [NPV_{i_1} : (NPV_{i_1} - NPV_{i_2})] \cdot (i_2 - i_1), \quad (7)$$

The calculation of this indicator involves determining the discount rate, the use of which would ensure equality of the current value of expected cash outflows and the current value of expected cash inflows. The indicator of the internal rate of return – IRR characterizes the maximum allowable relative level of costs that occur in the implementation of the investment project.

The practical application of this method comes down to the fact that in the analysis process two values of the discount rate $i_1 < i_2$ are selected so that in the interval (i_1, i_2) the function $NPV = I(i)$ changes its value from "+" to "-" or vice versa. You can also evaluate the effectiveness of investments based on the principles of operational analysis. Operational analysis is an analysis and forecasting of the enterprise on the basis of interdependencies between its fixed costs, variable costs, sales revenue and production volumes.¹

During the operational analysis, such indicators as the break-even point in kind and value, the margin of safety, etc. are determined. The use of operational analysis in investment calculations is due to the fact that during pre-investment research, businesses face problems in determining the amount of investment to finance the project and their future payback.

In particular, in this regard, the question arises about the optimal ratio of fixed and variable costs, the transition to break-even.²

It is convenient to use the graphical method to get quick and clear information about the "break-even point". To build an appropriate schedule you need to have the following data:

- the amount of fixed costs of the enterprise as a whole;
- volume of production;
- variable costs of production;
- unit price of the product.

In fig. 1 on the abscissa indicates the volume of output, and on the ordinate – the amount of costs or revenues (in the form of revenue from sales of the corresponding amount of products), which corresponds to it.

The break-even point of the investment project is determined by the point of intersection of the curves of total costs TC and total revenue TR. The total cost curve TC is formed by shifting the curve of variable costs VC up by the value of fixed costs FC.

A perpendicular dropped from the point of intersection on the abscissa axis will show the "break-even point" in kind, and a perpendicular dropped from the ordinate axis will show the "break-even point" in the value impression. The

¹ Mayorova TV Investment activity: Textbook. Kyiv: Center for Educational Literature. 2004. S. 183-192.

² Gulko LG Investment Analysis: A Study Guide. Lviv: "New World -2000". 2011. P.83-90.

definition of "break-even point" implies that the company reimburses all its costs and will receive neither profit nor loss.

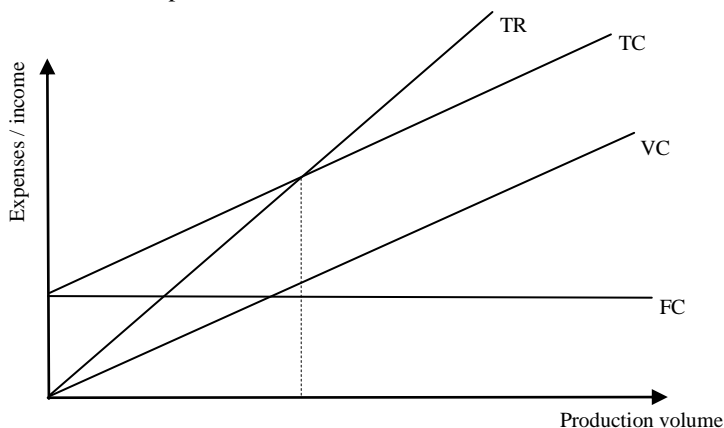


Figure 1 – Determination of break-even point of the investment project

Source: built by the author

Most researchers prefer "dynamic" methods of assessing the economic efficiency of the project, based on discounting the cash flows of the project. However, the use of dynamic methods in practice is complicated by the following obstacles:

- the need to correctly assess not only the amount of initial investment, but also current costs and revenues for the entire period of the project;
- lack of stability of the currency in which cash flows are estimated.

In this regard, the question arises about the feasibility of using dynamic methods of analyzing the effectiveness of investment in general: because in conditions of high uncertainty and the adoption of various assumptions and simplifications, the results of appropriate calculations may be even further from the truth. However, the analysis of the development and dissemination in practice of dynamic methods for determining the effectiveness of investments proves the need and possibility of their use to evaluate investment projects.

The choice of a method of assessing the economic efficiency of investment of an agricultural enterprise must have a certain basis and be carried out in the following sequence:

1. Construction of the concept of assessing the economic efficiency of investment.
2. Defining the principles of evaluating the effectiveness of investments.
3. Definition of criteria for selection of evaluation methods.

When constructing the concept, first of all, the conceptual directions of assessing the economic efficiency of investments should be determined, taking into

account their features and distinctive features (Fig. 2).¹

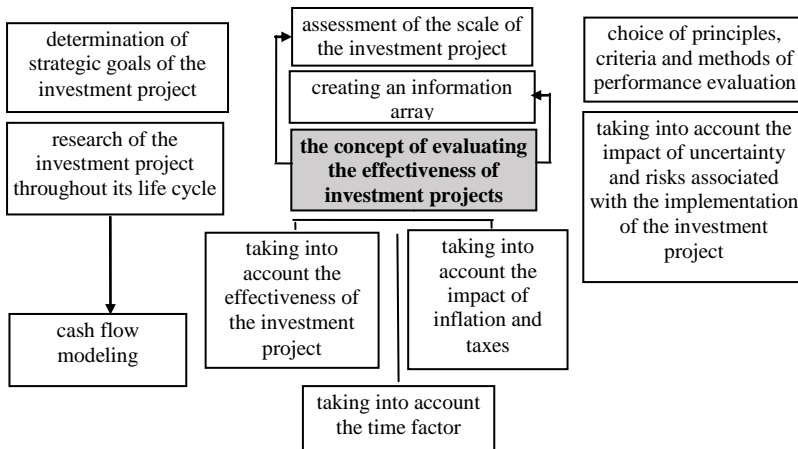


Figure 2 – The concept of evaluating the effectiveness of investment projects

Regarding the definition of the principles of investment efficiency assessment of agricultural enterprises, the principles should be: dynamism; complexity; completeness; simplicity; adequacy; integration; mobility; reliability; formalities; target orientation; correspondence between the result (effect) and the factors (resources) that led to obtaining this result; criterion; taking into account the peculiarities of the application of resource, cost and mixed approaches to the calculation of indicators of economic efficiency of investment activities of agricultural enterprises.

The following are recognized as generally accepted criteria to be met by methods of evaluating effectiveness in world practice:

- 1) the method must take into account changes in the value of money over time;
- 2) the method should take into account the riskiness of the project and allow to calculate the value of the opportunity cost of capital that reflects the interest rate on capital markets for investments with the same level of risk;
- 3) the method must take into account the full duration of the economic life of the investment project;
- 4) the result obtained must be objective, which is ensured by the presence of a simple rule for decision-making;

¹ Kuzmin E.S. Methods for determining the efficiency of investment in the dairy industry. *Scientific works of Kirovograd National Technical University. Economic sciences*. 2012. Issue 22. URL: [http://www.kntu.kr.ua/doc/zb_22\(2\)_ekon/stat_20_1/44.pdf](http://www.kntu.kr.ua/doc/zb_22(2)_ekon/stat_20_1/44.pdf) (access date: 24.10.2021).

5) the method should focus more on cash flows than on balance sheet profit.

Although all of the above methods have certain advantages and disadvantages, analysts often prefer the IRR criterion, as they consider more reasonable decisions made on the basis of analysis of relative rather than absolute indicators. Another advantage of the IRR criterion is that you do not need to know the cost of capital if you use it. On the contrary, the value of the IRR makes it possible to estimate the minimum financing costs at which the project will be profitable.

Given the known cost of financing, the application of the IRR method also yields a corresponding result, as it allows to estimate the "profitability reserve", i.e. how much the profitability of the project exceeds the cost of financing.

The use of different methods of investment valuation often leads to opposite results. An investment project acceptable under one criterion may be non-profit or unprofitable under another criterion. Therefore, to obtain a reasonable and largely reliable assessment of the economic efficiency of the investment project, it is advisable to use a set of the above methods, supplementing them with other formalized and informal criteria.

3.2 Innovation processes in the agricultural sector: the current state and specifics

The most important task of agriculture is the production of competitive products, which is possible only with the use of scientific and technological progress, based on innovative processes that allow constant renewal of agricultural production. Thus, using and implementing innovative developments, the agricultural enterprise reduces costs, increases production, profits, conquers markets, facilitates economic efficiency and development of the national economy. Within the framework of the agro-industrial complex innovations represent the introduction of research and development into economic practice in the form of new varieties of plants, breeds and species of animals and crosses for birds, food, materials, plant technology, animal husbandry and processing industry, fertilizers and plant and animal protection, methods of prevention and treatment of animals and birds, forms of organization, financing and crediting of production, approaches to training, retraining and advanced training of personnel, forms of organization and management of various sectors of the economy, approaches to social services to increase production efficiency.

Recently, terms such as 'innovation' and 'innovative development' are often used in conversation. At the same time, the agro-industrial complex is experiencing a huge innovation crisis, which is due to the insufficient development of scientific and technical direction in the field of agriculture. If we compare the use of Ukraine's innovation potential with the world's leading countries, it is used only 5-6%, while in the US this figure is about 50%. Every year about 40-50% of agricultural scientific and technical achievements and developments remain