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Vasyl Mukoviz
Ukrainian State University of Finance and International Trade
e-mail: mvc1963@mail.ru

Inna Komarova
Private Higher Education Institution "Kyiv Institute of Business and Technology"
e-mail: mvc1963@mail.ru

METHODOLOGICAL APPROACH TO THE EVALUATION OF THE INVESTMENT SUPPORTING ECONOMIC DEVELOPMENT OF AGRICULTURAL ENTERPRISES UNDER CONDITIONS OF UNCERTAINTY OF A COMPETITIVE ENVIRONMENT

Summary: Capital investment is the main facility of the realization of the strategic aims of an enterprise economic development, as well as an instrument of stimulating investment activity. Nowadays, capital investments in agriculture are of significant importance. They are characterized by capital-output ratio, a variety of forms and peculiarities of the procurement and the application of capital. The renewal and distribution of investment activity of agricultural enterprises depends on their ability to activate by themselves their own internal reserves of increasing the investment resources as well as public policy in attracting foreign capital. Under conditions of uncertainty in a competitive environment, the evaluation of the investment supporting the economic development of the agricultural enterprises became the guarantee of the formation of the competitiveness of both individual agricultural enterprises and the agricultural economic sector as a whole.

Keywords: management systems, controlling, investment activity, budgeting.

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1. Introduction

Under conditions of uncertainty of the competitive environment and market phenomena worldwide, enterprises have had to define their investment activity by themselves, as well as determine the existing financial resources and means to achieve the desired goals. That is to say to form their own investment policy. Some periods of crisis in the economic system are characterized by high dynamism which

requires from each entity to respond quickly to change in the economic conditions and to increase the ability to correct the practical actions immediately. Thus, the enterprise which has such qualities can secure for itself the gradual switching to the qualitatively new state management.

The relevant investment support is an objective condition for the efficient activity of domestic agricultural enterprises, as well as the transition to a new quality of their economic development, that points to the need to apply modern principles and methods to the process. Therefore, the problem of the formation of modern conditions of investment supporting the economic development of the agricultural enterprises needs the generalization and analysis.

Ukrainian and foreign scientists have overly focused on the theory and practice of investment supporting the enterprises. Among them are V. Heeits, I. Lukinov, O. Mertens, A. Peresada, P. Rohozhyn, V. Savchuk, V. Pareto, P. Samuelson, W. Sharp and others. The problems of the methodological approaches of investment supporting the economic development of agricultural enterprises were studied by B. Andriichuk, M. Demianenko, M. Kisil, M. Kodenska, E. Lanchenko, Y. Lupenko, P. Sabluk and others.

The objective of the article is the substantiation of the methodical foundations and development of an evaluation method of investment supporting the agricultural enterprises.

2. Efficiency of investment as a basis of economic development of agricultural enterprises

According to the Law of Ukraine «On investment activity», the profit or social effect must be earned from the investment, but investment result could be one that cannot be determined by value [*Інвестування*, 2003, с. 130].

Investment process is the process of realization of the investment activity. The process of investment is generally understood as a kind of orderly phenomenon. A typical model of the adoption and implementation of investment decisions involves the following steps: search for projects; formulation of objectives and initial evaluation of the projects; development and implementation of the projects; monitoring of the project implementation and its efficiency.

The main stages of investment processes are shown in Figure 1.

Experts in the field of investment analysis have always tried to model the process of acceptance of the investment decision. There are lots of such models, all of which have common features and a standard sequence of the basic elements of the acceptance and implementation of the investment decisions. The origin and occurrence of the investment process take place in the internal environment of the enterprise. Although its relation with some aspects of the enterprise's activity is not always obvious, the process of acceptance of the investment decision is inseparably related to the internal environment of the enterprise.

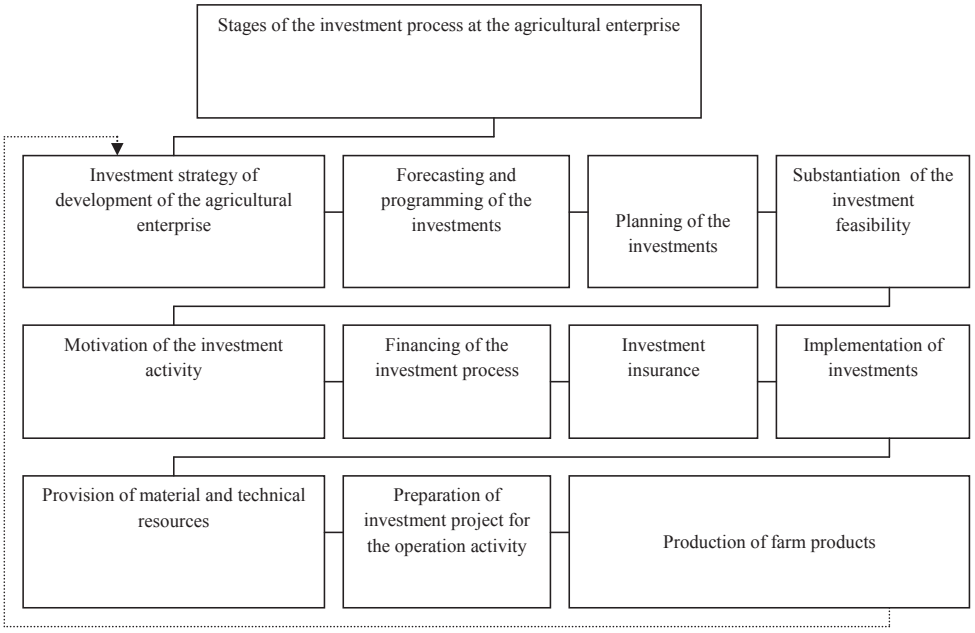

Fig. 1. Principal stages of investment process at the agricultural enterprise

Source: developed by the author on the basis of [Кісіль 2004; *Методические рекомендации*... 2000, с. 125].

A wide range of factors influence the investment efficiency in agriculture. The scientists classify them by types, groups, directions, etc. In particular, according to the methodological recommendations for the evaluation of the efficiency of capital investments in agriculture, the following factors are distinguished: natural and climatic, biological, economic, organizational, productive and technological, social [*Методичні рекомендації*... 2006, с.11].

The variety of the forms of investment efficiency has led to its division into types. According to the methodological recommendations for the evaluation of the efficiency of the investment projects and their selection for funding, it is recommended to determine these types of efficiency:

- commercial efficiency, by applying it the financial results of the project realization are calculated;
- budget efficiency displays the results of the investment project for different levels of the budget (national, regional, district or local);
- economic efficiency describes the correlation of spending and revenue associated with the implementation of the project and considers the interests of both its members and the interests of the country or region [Зелль 2010, с. 117].

The social and environmental results of the economic activity are derived from the economic investment factor. Generally, social and ecological efficiency increase

with the increase of economic efficiency. Consequently, the economic efficiency of investment is inseparably associated with social and ecological efficiency.

The factors which decrease the investment risks belong to the factors that facilitate the increase of efficiency of the investments, i.e.:

– congenial investment climate and legal framework of the state,
– political will of all government branches,
– developed financial credit system,
– favorable status of the foreign investors,
– a high level of development of the productive forces,
– favorable status of the investment market conditions,
– high investment activity of the population.

3. Methodological aspects of evaluation of the investment supporting the economic development of an agricultural enterprise

In economic theory and practice the methods of evaluation of the investment supporting an agricultural enterprise can be divided into two groups: static and dynamic [Гуткевич, 2001].

The main disadvantage of static methods is that they do not consider the changes of base values in a time interval and this can distort the results of the research. In particular, both the current expenses and the income in agriculture differ for certain years and the usage of the average values in the process of evaluation generates the margin of values of effective indices.

The main provisions of applying the dynamic methods during the evaluation of the investment supporting the economic development of agricultural enterprises include: the evaluation of the investment outlay should cover the total resources (financial, material and human resources) that are used; the evaluation of investments should be based on a comparison of expenditure investment resources with the flowback of invested capital; the evaluation of flowbacks of invested capital is realized by calculating the net cash flow. This index can be calculated as the annual average or as differentiated for individual periods; it is necessary to bring to the present the value of the investment spending and the net cash flow for the investigated period that is associated with a change of the value of these indices in different periods. It is reasonable to use a differentiated approach to the identification of the discount rate while determining the present value of cash flow from the investments. The value of net cash flow depends on the impact of factors such as the inflation rate, the real value of the discount rate, investment risk, etc. On this basis, the relevant discount percentage rate should be determined for every investment project. Specifically, it is reasonable to apply the higher discount rate for risky projects; to use the different forms of interest rates depending on the objective of evaluating investments, in particular the average deposit or lending rate; the rate of return on government securities; the individual rate

of return considering the inflation rate, the liquidity level and investment risk; the rate of return on current activity [*Инвестиционная деятельность*... 2009, с. 325-331].

Experience has shown that in the efficient management of the investment process in agriculture it is reasonable to use a system of indices that should be formed on the basis of a single methodological approach, which provide an opportunity to determine the feasibility of acceptance of both the separate project and characterize the state of the investment at the level of the whole enterprise. Such a system of indices has to show the most important features of investment and to provide the opportunity to respond quickly to changes in the internal and external factors which influence the process, as well as to characterize the intensity of such changes. The practice and analysis of the existing system of indices of investment supporting the economic development of agricultural enterprises show that the indicative factors can be the following: the amount of the investment resources, the structure of the investment resources, source formation of the investment resources, the indices of the efficiency of the enterprise's investment activity.

The system of indices of investment resources includes two components:

- indices of the range of the total and net investment per unit of used inputs which indicate the dynamics of investment processes on the agricultural enterprises (per 1 ha of agricultural land, 1 average worker; 1 UAH value of capital, 1 UAH value of the operating capital),
- indices of the range of the total and net investment per unit of production and consumed resources, which show the type of reproduction processes on the agricultural enterprises (per 1 UAH of monetary evaluation of land resources; 1 UAH for salary; 1 UAH of amortization; 1 UAH of material spending).

Indices of the structure of the investment resources of agricultural enterprises allow us to analyse their real and financial investments. The lead time on investment is the main index of evaluating the financial investments.

The amount of own, borrowed, outside and budget investment should be included into the system of indices of the sources of investment resources formation.

Net Present Value is widely used while evaluating the economic efficiency of the investment. NPV is an absolute index that is calculated as the difference between the sums of investment and positive cash flow for the period of project operation:

$$NPV = \sum_{t=1}^{n} CF_t * \alpha - \sum_{t=1}^{n} I_t * \alpha \quad (1)$$

$$\alpha = \frac{1}{(1+r)^t}, \quad (2)$$

where: NPV – Net Present Value, thousands of hryvnias,
CF_t – net cash flow of t year, thousands of hryvnias,
I_t – sum of investment in t year, thousands of hryvnias,
n – number of years of project realization,
α – discount coefficient,
r – discount rate [Липсиц 1996, с. 144].

Under conditions of uncertainty in the competitive environment it is impossible to make a final decision on the feasibility of the investment project, as the discount rate can fluctuate during the period of the project's realization. That is why the yield index is an important index to determine the economic efficiency of the investments. This index is calculated by the formula:

$$PI = \frac{\sum_{t=1}^{n} CF_t \cdot \alpha}{\sum_{t=1}^{n} I_t \cdot \alpha}, \tag{3}$$

where PI – is the yield index [Павловська 2011, с. 407-408].

The yield index shows the value of the revenue per unit of investment. The project will be acceptable on condition that the yield index exceeds one unit. Otherwise the project is not feasible for acceptance because it will not bring the additional income to the investor on invested capital.

To evaluate the efficiency of investment of the agricultural enterprises in various financial terms, the following formula is used:

$$E_F = \frac{\sum_{t=1}^{n} \frac{RCF}{(1+r)^n} - I_F}{I_F}, \tag{4}$$

where: E_F – efficiency of the investments of the agricultural enterprise,
RCF – expected return cash flow for the period of usage of the financial instrument, thousands of hryvnias,
r – expected rate of return,
I – investment sum of the enterprise, thousands of hryvnias [Алексійчук 1999, с. 177-178].

It should be noted that to determine the economic efficiency of the investment activity in agricultural enterprises as a whole it is reasonable to use an index that is calculated by the formula:

$$E_I = \frac{\Delta E}{I_{Бп}}, \tag{5}$$

where: E_I – efficiency of investment activity of the agricultural enterprise,
ΔE – change of an effect in the reporting period compared to the base, thousands of hryvnias,
$I_{Бп}$ – investment sum in the base period, thousands of hryvnias.

In order to get the effect, the following indices can be used: increase of revenue from product sales, increase of gross profit and net income; increase of cash flow; increase of net output, etc.

The level of social efficiency of the investment at the agricultural enterprise is determined with the following indices: increase of salary fund for 1 UAH investment; improvement of the working conditions.

Regarding the environmental consequences of an investment project in agriculture, its efficiency can be defined by the efficiency coefficient of investment in environmental protection measures, which is calculated by the formula:

$$E_{Inp} = \frac{\Delta E3}{I_{Бп}}, \quad (6)$$

where: E_{Inp} – efficiency of investment in environmental protection measures of the agricultural enterprise;
$\Delta E3$ – prevented economic losses (economic harm) by reducing contamination in the reporting period compared to the base, thousands of UAH;
$I_{Бп}$ – sum of investment (general or net) in the base period [тис. грн.].

Depending on the purposes of the analysis, the specified system of indices of investment supporting the economic development of agricultural enterprises can be used for the evaluation of specific investment projects and to evaluate the level of investment supporting the enterprise as a whole or a number of enterprises.

When evaluating of the investment supporting the agricultural enterprises, it is necessary to consider the risks of agricultural production: weather conditions, pests, epidemics, crop failures, etc., that can influence significantly the final results of the implementation of the investment projects. In this case, a range of methods of quantitative analysis are used: method of export evaluation, expectable method, coefficient of variation, beta-coefficient, the method of analogy, the method of interest rate adjusted for risk, the method of critical values and the most used methods of diversification, insurance, hedging and distribution of investment risks.

Agricultural enterprises can simultaneously realize several investment projects and investment activities performed in both the real and financial sectors. That is why the methods, approaches and indices which are based on accounting data and are used for the evaluation of company activity.

In order to evaluate the economic efficiency of investment and its life cycle, the discounted cash flow method is used, this method takes into account the impact of the time factor, as the value of investment and income in different periods of time is not the same. Therefore at the planning stage the integral index is used, which is calculated by one of three alternatives: rate of return (the inverse rate of payback period); discriminative method of analysis or the method of principal components [Павловська 2011].

4. Conclusions

When analyzing the methodological approaches to investment supporting the economic development of agricultural enterprises under conditions of uncertainty in the competitive environment, we consider that only a comprehensive, systematic

approach to the evaluation of the defined problem on the basis of the proposed system the appropriate indicative parameters can provide precise results. The following indices should be used as indicative: the amount and structure of the investment resources, the amount of production spending per unit of an area, the rate of recoupment of expenses.

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METODOLOGICZNE PODEJŚCIE DO OCENY INWESTYCJI WSPIERAJĄCYCH ROZWÓJ GOSPODARSTW ROLNYCH W WARUNKACH NIEPEWNOŚCI I KONKURENCYJNEGO OTOCZENIA

Streszczenie: Autorzy prezentują w artykule metody oceny inwestycji w gospodarstwach rolnych. Obecnie inwestycje mają szczególne znaczenie dla rozwoju gospodarstw rolnych. Charakteryzują się różnymi formami realizacji oraz finansowania. Wysokość tych inwestycji zależy z jednej strony od kondycji finansowej gospodarstw rolnych, a z drugiej strony − od instrumentów polityki państwa ukierunkowanych na wspieranie rozwoju gospodarstw rolnych. W warunkach niepewności metody oceny inwestycji w gospodarstwach rolnych wpływają na osiągnięcie przewagi konkurencyjnej.

Słowa kluczowe: gospodarstwa rolne, inwestycje.