

## ECOLOGICAL AND ECONOMIC INVESTMENTS OF AGRICULTURAL ENTERPRISES

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**Abstract.** Theoretical, methodological and practical aspects of ecological and economic investment of agricultural enterprises and investment in the agribusiness sector to increase its economic efficiency have been studied. Essence of investment attractiveness of environmental entrepreneurship has been justified. Peculiarities of investment management of agricultural enterprises have been clarified. The features and trends in investment activities of environmentally oriented businesses have been analyzed, classification of criteria for the assessment of the socio-ecological-economic efficiency of investment in agriculture has been made.

**Key words:** investment, agricultural enterprises, economic efficiency, investment attractiveness

### INTRODUCTION

A close connection between agricultural production and nature under the industrialization of agricultural sector has resulted in adverse environmental changes. The complicated ecological situation in agriculture is characterized by the absence of targeted financial resources intended for restoration of natural resources. Ecological and economic problems in the agrarian sector are the result of an overload of extensive agricultural development in the past, lack of effective policy on greening of agribusiness.

The only realistic and effective way to solve the environmental problems of agricultural production should be intensification of investments with the purpose of financing the acquisition of environmental and resource-saving technologies, implementation of other measures to preserve the environment. Therefore, one

of the state programs of support and development of the agrarian sector is the program of innovation and investment policy of the government, which requires creation of a unified system of effective ecologically sound forms of management that could spark interest of agricultural workers in productive work. The determining factor should be the innovation management, aimed at ensuring such way of functioning of the managed system of agricultural production that will allow to create favorable conditions for investments to comply with the parameters of environmentally sustainable development of agriculture.

## RESEARCH METHODS

Goal of the research is to draw up scientifically grounded proposals for the development of ecological and economic investments of agricultural enterprises and promotion of investments in the agribusiness to increase its economic efficiency. Implementation of this goal is associated with the solution to the following tasks:

- to study the features and trends of investment in agricultural enterprises,
- to justify the essence of investment attractiveness of environmental entrepreneurship and make classification of criteria for the assessment of the socio-ecological-economic efficiency of investment in the agrarian sector,
- to analyze the features of investment management of agricultural enterprises.

Object of the research is ecological and economic investments of agricultural enterprises in Ukraine, practice of its implementation as a tool of investment management.

The following methods were used in the research: analytical, statistical, normative, formalization, observation etc.

## RESULTS

### Features and directions of agricultural enterprises investments

The goal of ecological and economic investments aimed at increasing the economic efficiency of agricultural production with the environmental interests should be the transition of agricultural production to a new level that meets the requirements of modern society. The essence of such transition is a quantitative accumulation of qualitative changes in the elements of the system of agricultural production greening, a new structural combination of which in their interrelation and interaction will lead to a more rational nature management in this area.



The experience of the countries with advanced economy shows that agribusiness is attractive for investment, as agricultural production is always in a steady demand, which does not tend to decrease, and agricultural products (as opposed to the technology of their production) are never obsolete 'technically and technologically', as confirmed by evolutionary process of economic development [Mishenin et al. 2011, p. 74].

In Ukraine in 2011 economic entities from all sources of financing in agriculture, hunting, forestry invested UAH18.2 billion in fixed capital, that is 32% more than in 2010. The share of investment in these economic activities is 7.7% of the national volume of investments in fixed capital (in 2010 – 70.2%). By means of funds of the state budget UAH317 million have been disbursed, that is 1.7% of capital investments in this activity. It should be noted that a significant share of investments in agriculture, hunting, forestry have been disbursed in crop production (71%). Investments in fixed capital by types of economic activities are presented in Table 1.

**TABLE 1.** Investments in fixed capital by types of economic activities (actual price)<sup>a</sup>

Sector of economy	2001	2005	2008	2009	2010	2011
Total	32,573	93,096	233,081	151,777	171,092	238,175
Agriculture, hunting, forestry (UAH mln)	1,617	5,016	16,890	9,382	12,231	18,183
including agriculture, hunting and related services	1,552	4,905	16,682	9,295	12,106	17,981
Industry (UAH mln)	13,651	35,031	76,618	57,658	58,558	86,313
food, beverages and tobacco manufacturing	2,187	6,418	13,130	10,458	8,297	12,144
Total (%)	100	100	100	100	100	100
Agriculture, hunting, forestry (%)	5.0	5.4	7.2	6.2	7.2	7.7
including agriculture, hunting and related services (%)	4.8	5.3	7.1	6.1	7.1	7.6
Industry (%)	41.9	37.6	32.9	38.0	34.2	36.2
food, beverages and tobacco manufacturing (%)	6.7	6.9	5.6	6.9	4.8	5.1

<sup>a</sup>Exchange rate UAH/USD was 7.97 in 2011.

Source: State Statistics Service of Ukraine: <http://www.ukrstat.gov.ua/>.

As at 31 December 2011, \$813.4 million of foreign direct investments were made (cumulative from the beginning of investment) in the development of agriculture, hunting and forestry, which is 1.6% of the total volume of foreign direct investments in Ukraine.

The major focus of investment in natural resources restoration used in the agrarian sector is investment activities aimed at the improvement of soil fertility, for land is indispensable and territorially limited means of production.

Poor ecological state of Ukrainian farmland, primarily black soil, gives rise to concern. 11 million tons of humus, 0.4 million tons of phosphorus and 7 million tons of potassium are lost annually with soil, which is 2.3 times more than applied with fertilizers [Burlaka 2010, p. 33]. Over the past decade the process of dehumification has accelerated. A tendency toward deterioration of soil quality at growing single-crops has been revealed before mechanization and chemicalization, which negatively affecting soil bioproductivity through compaction, accumulation of pesticides and other harmful substances, enhanced it considerably. Improper use of mineral fertilizers and crop protection chemicals leads to expansion of soil contamination, endangers human health and threatens the stability of ecosystems.

The influence of environmental conditions on production is still insufficiently investigated, but these conditions begin to play an increasingly larger role in farm planning. The goal of environmental and economic planning is not only to identify the conditions necessary to increase production, but also to ensure a balance between production and environment where land plays the main role. So, in agricultural nature management most of the focus should be on the environmental aspects of land use – land protection from pollution and restoration of degraded land with the purpose of its further effective use by current and future generations that needs to attract investment [Kozhemyakina 2009, p. 36].

Several approaches are possible to develop indicators of food efficiency of land use. The first approach involves evaluation of certain food output per unit of total area of the state ( $E_i$ ) or region ( $E_{ir}$ ). The calculation is carried out using this formula:

$$E_i = P_i/T \quad (1)$$

$$E_{ir} = P_{ir}/T_r \quad (2)$$

where  $P_i$  – output of  $i$  (certain) food product in Ukraine (in our case  $i = 1, 2, \dots, 5$ ), which takes on a value from one to five;  $P_{ir}$  – output of  $i$  (certain) food product in the  $r$  (certain) region of Ukraine (as regions are administrative regions and the Autonomous Republic of Crimea;  $r = 1.25$  or  $r = 1.8$ ;  $T$ ,  $T_r$  – total land of the country and  $r$  (certain) region, respectively. Numerators of the formulas (1), (2) are measured in thousands of tons and denominators – in thousand of hectares. Whereas agricultural output in statistics is often measured not by one hectare, but a hundred of acres, it can be taken into account by the coefficient  $k$  ( $k = 100$ ). Then the corresponding formulas will be the following:

$$E_i = P_i / (T \cdot k) \quad (3)$$

$$E_{ir} = P_{ir} / (T_r \cdot k) \quad (4)$$

In formulas (1)–(4) denominators are constants and numerators are variables in the time dimension. It is known that not all lands are used for food production. Therefore, to assess food efficiency of land use it is expedient to take into account areas of land that are involved in the implementation of food function. These are the lands of rural enterprises and households. Relevant areas for the country and the region are denoted by  $T^1$  and  $T_r^1$ . In formulas (1)–(4) let us replace the values of  $T$  and  $T_r$  by  $T^1$  and  $T_r^1$ . As a result, we obtain these expressions:

$$E_i^1 = P_i / T^1 \quad (5)$$

$$E_{ir}^1 = P_{ir} / T_r^1 \quad (6)$$

Indicators  $E_i^1, E_{ir}^1$  can be interpreted as food efficiency of productive and active land resources of the country ( $E_i^1$ ) and  $r$  (certain) region ( $E_{ir}^1$ ) for  $i$  (certain) product. Quantitative values of  $T^1, T_r^1$  are much lower than  $T$  and  $T_r$ , therefore, have the following relations:

$$E_i < E_i^1 \quad (7)$$

$$E_{ir} < E_{ir}^1 \quad (8)$$

Unlike  $T$  and  $T_r$ , indicators  $T^1, T_r^1$  are variables. For each certain year the difference between  $E_i$  and  $E_{ir}$  can be determined by the formulas:

$$E_i^1 - E_i = P_i \cdot (T - T^1) / (T^1 \cdot T) \quad (9)$$

$$E_{ir}^1 - E_{ir} = P_{ir} \cdot (T - T^1) / (T^1 \cdot T) \quad (10)$$

Food efficiency of land use as one of the aspects of the effectiveness, restoration and conservation of natural resources, deserves high attention in solving urgent problems of increasing state food security and possibility of their solution at the global and regional levels, the greening of business.

Comprehensive socio-economic effect of environmental activities is characterized by increase in the efficiency of social production and improvement in living standards. Economic efficiency is characterized by the level of savings of living and materialized labour, gain in net product and profit as a result of conservation measures. The social results of the implementation of ecologically sound technologies and other measures in the agrarian sector include the improvement in working and living conditions of rural workers, the ecological balance between



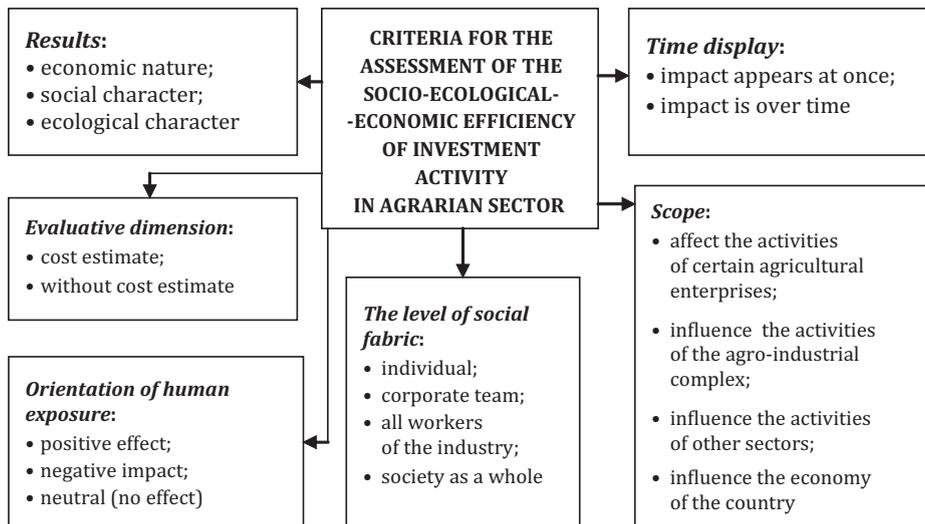
agricultural production and the natural environment under intensification of crop and livestock sector. If necessary, social benefits have monetary value and are included in total economic impact of environmental costs. Scientifically based reproduction of natural resources provides considerable economic and ecological impact. Efficiency of measures is determined in agriculture as a whole, as well as individual enterprises, sectors and directions of intensification of agricultural production.

### **Investment attractiveness of environmental entrepreneurship**

The strengthening of government control over land use and environmental conditions leads to the development of environmental entrepreneurship – specific form of socially useful activities, the essence of which lies in the reproduction and rational use of natural resources involved in the production. The economic expediency of environmental entrepreneurship is obvious: first and foremost, it is the return of free goods, ‘lost’ for the society, to agricultural resource circulation, attraction of previously inaccessible resources.

Considering the world experience in economic solutions to environmental problems of agriculture, the impetus for the development of environmental entrepreneurship in agrarian sector of Ukraine should be tax incentives for environmental investment – investment in ecologically sound technologies and equipment through tax methods [Shtukaturova 2009, p. 67].

Evaluation of economic efficiency of investment plays an important role in determining the investment attractiveness of environmentally oriented enterprises. An integrated assessment of social, ecological and economic results of investment activities in agricultural production can be developed, provided that social and environmental outcomes expressed in physical indicators, can be denominated in value terms. However, the specific features of agricultural production complicate social, environmental and economic evaluation of the effectiveness of investment in agriculture. The most important ones include the uneven machinery use over time, structural changes in soil (water – air regime, erosion resistance, microflora and zoofauna development), the impact of a number of biological factors, especially the chemical composition of the air in livestock houses, accompanied by a high content of pollutants (ammonia, hydrogen sulphide, carbon dioxide and others). Social outcomes in agricultural production are sometimes manifested not immediately, but after a lag. In addition, they are formed indirectly through flora and fauna. Environment is the first to be affected: air, soil, water, which in turn in modified form influence the flora and fauna, and the last have impact on a person through food consumption. Manifestation of socio-ecological and economic results of investment activity in the agrarian sphere by the evaluation criteria is depicted in Figure 1.



**FIGURE 1.** Classification of criteria for the assessment of the socio-ecological-economic efficiency of investment in the agrarian sector

Source: Authors' presentation.

The above classification makes it possible to evaluate the socio-ecological and economic effectiveness of investment in agro-industrial production, that is, there is a real opportunity to establish the impact of each criterion on the efficiency of investment. The best option of investing will be a project, which is cost effective and meets the criteria for evaluating the socio-ecological and economic efficiency [Kletsova 2009, p. 91].

According to the estimates of the State Statistics Committee, as of 1 January 2011, the total volume of direct foreign investments made in Ukraine (cumulative), adjusted for its revaluation, losses and exchange rate differences amounted to \$44.7 billion (per capita is \$978.5).

In the first quarter of 2013, the volume of direct foreign investments in the Ukrainian economy grew by 1.3% – \$55.709 billion and amounted to \$1.56 billion, that is 76.25% higher than the similar indicators of 2012. The overall contribution of foreign investors from the beginning of investment on 1 April 2013 is \$55.709 billion. In terms of per capita is \$1.237 thousand.

A crucial prerequisite for successful investment activity of enterprises in market conditions is the efficient investment of additional capital, as investments are subject to control. Therefore, the intensification of investment activity in the agribusiness on the micro and macro levels should be controlled. Enhancement of investment is possible on the basis of planning, which is an important element in the structure of the organizational and economic mechanism. In order to attract investment it is necessary to develop an investment project or program.

## Management of investment activity of agricultural enterprises

The need to evaluate the environmental component of the investment project is based on the principles of social and ethical marketing and regulated by the laws of Ukraine about land rent and about environmental protection and others. Potential investor assesses production process in terms of environmental protection and conservation measures which should ensure compliance with the project:

- reduction in emissions that meet environmental standards in Ukraine,
- lack of toxic and hazardous substances,
- maintenance and improvement of land quality,
- rational use and decline in the amount of natural resources involved in the exploitation,
- decrease in emissions of pollutants into the environment.

Management of all aspects of the investment activity of enterprise occupies the central place in the organizational and economic mechanism of intensification of the investment process in agribusiness. It includes management of investment projects, economic and financial levers. During agrarian reform on enterprises changes in the forms of ownership and management have occurred, methods of investment management are gradually changing. Analysis of the activity of agricultural enterprises has shown that the best results can be seen where there is a new system of management, with the technological requirements being met and the needs of the market being taken into account.

Relations in the agrarian investment process are regulated by a system of economic, financial and other instruments used through the mechanisms of taxation, financial, pricing and depreciation policy, financial assistance in the form of government grants, subventions, subsidies and budget loans, government regulations and standards, regulation of the participation of investors in the privatization, examination of investment projects and other activities. The vast majority of the elements of the mechanism of investment scope is wide and extends to the agrarian sector as an integral part of the national economy. On this basis, the individual components of the mechanism of investment management in agribusiness industry should be considered as a national function.

The need for investment in agricultural productive sector is quite significant, so it is essential to mobilize all available investment resources. The analysis of existing sources and methods of investment financing has revealed that the main criterion for optimization of the ratio between private, borrowed and loan capital should be a high financial stability of enterprises and maximization of profits from investment activity. The choice of methods of investment financing enables to calculate the proportion in the structure of investment sources. The most common of them are a complete self-financing, shareholding, credit financing, leasing and mixed financing.

The classic form of self-financing is equity in the form of profits and depreciation. In countries with a developed market economy, the level of self-financing amounts to 60% or more. An important direction of intensification of reproduction processes in the agrarian sector is the technical re-equipment of agricultural enterprises, providing opportunities for the acquisition of mineral fertilizers, pesticides and other plant protection products; development of the industry of the storage and local processing of agricultural products, application of high-intensive crop varieties of domestic and foreign selection, the breeding of animals with high genetic. In modern conditions we offer to solve this problem positively through leasing, which in its economic essence is the investment of funds on the repayable basis in the fixed capital, in its content it is a loan provided by the lessor in the form of equipment.

The capacity of Ukrainian banks and other credit institutions is too small to reserve funds for the provision of long-term loans and guarantees on loans for the purchase of machinery, equipment and upgrade of worn-out fixed assets. Therefore, with the purpose of investment in agricultural enterprises a state leasing fund has been established; the network of machine and technological stations acquires further development.

Another source of financing of innovative programs on the reproduction of natural resources in the agrarian sector can be an investment tax credit. It can be defined as a deferred payment of the profit tax that is given to the business entity for a specified period with the aim of increasing its financial resources to implement innovative programs with subsequent compensation of the amounts deferred in the form of additional tax revenues due to the general growth of the profit that will be received in accordance with the current legislation as a result of innovative programs.

Investment tax credit should be target-oriented. It is expedient to provide investment tax loan mainly for the innovative programs (Figure 2). Introduction of the investment tax credit has certain advantages compared to other forms of credit. Thus, in case of ordinary bank lending free credit resources are used, which are often in short supply. In addition, bank loan is provided on the payment of considerable interest, which makes investments for the account of such credit economically unjustified for enterprise. On the other hand, in the case of reduction in interest, banks are not interested in providing credit resources, except that financing of investment projects requires long-term loan repayment that links 'fast money' of banks.

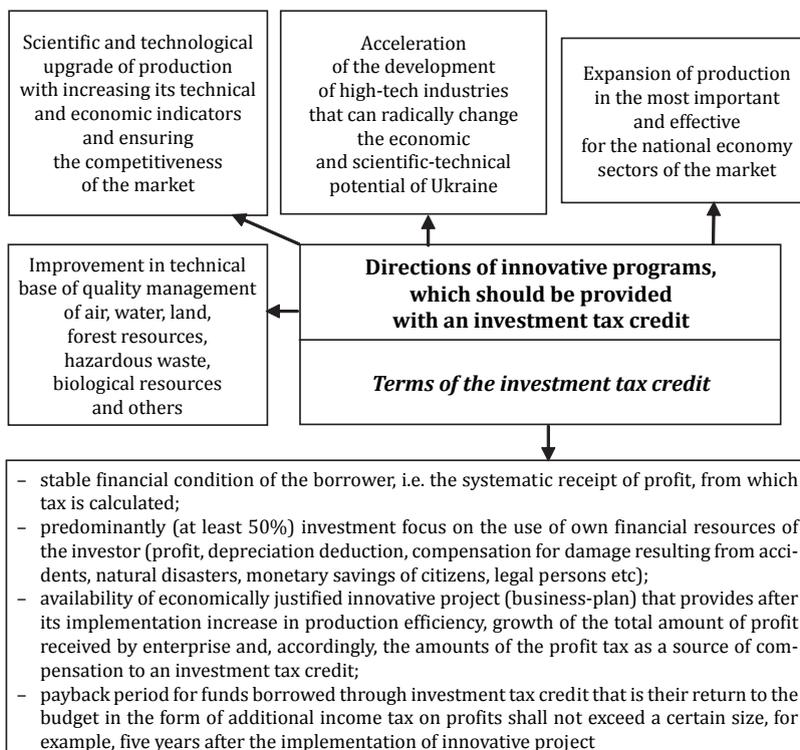
Implementation of the investment tax credit does not require additional credit resources, as it uses resource potential of enterprise in the form of profit (the part that should be paid to the budget as income tax). Therefore, the introduction of the investment tax credit will encourage enterprises to increase their efficiency and profit.



The state, losing a certain amount of budget revenues for some time, in the future can expect an increase in revenues due to the overall growth of income and tax on it. It is necessary to take into account that in the case of the ordinary credit lender, in addition to the amount of credit that is returned, receives only a specified percentage. When using the investment tax credit, tax increment obtained after implementation of the project could far exceed the interest rate and will be not single, but systematic.

The investment tax credit should not be regarded merely as another form of preferential subsidies to enterprises. Credit granting should create an incentive effect and reduce borrower to discipline. Therefore, the principles of implementation and use of the investment tax credit should not fall out of the common economic space – they must conform to the terms of the tax and credit policy in force in the state (Figure 2).

Consumers of investment tax credit can be entrepreneurs, namely enterprises of all forms of ownership, which are in short of their own investment resources to implement innovative programs. The decision to grant a loan, depending on



**FIGURE 2.** Directions and terms of the investment tax credit

Source: Authors' presentation.

the sectoral subordination of enterprises, are adopted by the ministries (departments) that on behalf of the Cabinet of Ministers of Ukraine are the managers of the investment tax credit at the sectoral level.

Investment tax credit is received on the basis of a loan agreement between the sectoral ministry (office) and the borrowing enterprise. It should be preceded by a comprehensive examination of the effectiveness of the innovation programme (business plan) and the existence of conditions which would confirm the real possibilities of the enterprise in the successful implementation of this program. The total amount of resources of the investment tax credit is annually determined in the budget by the Cabinet of Ministers of Ukraine. Proceeding from the economic situation of the country, it may reach 10% in the budget receipts of the profit tax with subsequent distribution of the tax discounts on ministries (agencies) according to the priority directions of innovative activities.

Tightening the requirements for the efficiency use of investment resources, we consider it appropriate to emphasize that investment tax loan can be granted to enterprises under a specific innovative project for a period up to five years. Longer term does not meet modern requirements concerning the period of development of the new technology (new production), leads to a dispersion of public resources, reduces the efficiency of investment [Mishenin and Piznya 2012, p. 42].

Given that the source of the investment tax credit is a tax, the annual amount of the loan may not exceed the total sum of tax paid by enterprise from the profit at year-end.

In respect of the responsibility of businesses for the use and repayment of the loan it should be noted that although the conditions for granting investment of tax credit do not contain requirements for the payment of interest on a loan, it is necessary to provide such a regulation, according to which the company-borrower, in case of breach of contract on the term of realization of the innovative project and repayment of the loan, pays to the budget for all the time the indebtedness of a penalty in the amount of average weighted rate of the National Bank of Ukraine, calculated for the entire period of delay.

Control over compliance with the provision, use and compensation of the investment tax credit should be put on the line ministries (departments) and the State Tax Inspectorate at the place of location of the company-borrower.

## CONCLUSIONS

Motivation to attract investment in production and natural resource potential of the agri-industrial complex depends on financial stability, flexibility and stimulating character of the tax policy, completion of the reform of ownership. Creation of

favorable investment climate in the agrarian sector and promotion of investment activity of all economic entities, considering the current financial and material-technical provision of agricultural enterprises need solution of the issue of quality changes in approaches to the management of agro-industrial production as a whole, every industry and business entity. Therefore, it is essential to form an effective mechanism of the ecological and economic investment management in the agrarian sector, adequate to the conditions of current economic status, taking into account the specifics of agricultural production, that will be able to create profitable conditions for stimulating savings of agricultural capital, and increasing the efficiency of its use, that is possible due to the development of ecological agribusiness.

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## EKOLOGICZNE I EKONOMICZNE INWESTYCJE PRZEDSIĘBIORSTW ROLNICZYCH

**Abstrakt.** W artykule przedstawiono teoretyczne, metodyczne i praktyczne aspekty inwestowania przedsiębiorstw rolniczych oraz inwestowania w sektor agrobiznesu, w celu zwiększenia jego efektywności ekonomicznej. Zdefiniowano istotę atrakcyjności inwestycyjnej przedsiębiorstwa ekologicznego. Określono cechy charakterystyczne zarządzania inwestycjami w przedsiębiorstwie rolniczym. Analizie poddano tendencje w kształtowaniu aktywności inwestycyjnej przedsiębiorstw proekologicznych, a także dokonano klasyfikacji kryteriów oceny społecznej, ekologicznej oraz ekonomicznej efektywności inwestowania w rolnictwie.

**Słowa kluczowe:** inwestycje, przedsiębiorstwa rolnicze, efektywność ekonomiczna, atrakcyjność inwestycyjna