Nina M. Petrukha[1], Serhiy V. Petrukha[2]

EFFICIENCY EVALUATION OF INVESTMENT INNOVATIVE PROJECTS BASED ON PUBLIC-PRIVATE PARTNERSHIP IN THE AGRARIAN SECTOR OF UKRAINIAN ECONOMY

The article describes the possibilities of public-private partnership as a component of providing the institutional ability of further production, stocking and processing capacities' modernization with the purpose to promote Ukrainian agrarian sector competitiveness, as well as creating favourable conditions for balanced development of diversified innovative production in the agrarian sector itself and in the connected economic activities. Critical evaluation is given to the existing normative-methodical support for investment-innovative projects, realized through public-private partnership in national agrarian sector. Also, an author's approach is suggested to the indicative activities basis decompression and the efficiency evaluation of such projects as a component of the investment relations system between state and private partners in the agrarian sector.

Keywords: innovative development; agrarian sector; investment-innovative projects; investment efficiency evaluation; public-private partnership.

Ніна Н. Петруха, Сергій В. Петруха
ОЦІНЮВАННЯ ЕФЕКТИВНОСТІ ІНВЕСТИЦІЙНО-ІННОВАЦІЙНИХ ПРОЕКТІВ НА ОСНОВІ ДЕРЖАВНО-ПРИВАТНОГО ПАРТНЕРСТВА В АГРАРНОМУ СЕКТОРІ ЕКОНОМІКИ УКРАЇНИ

У статті розкрито можливості державно-приватного партнерства як елементу забезпечення інституційної спроможності подальшого оновлення та модернізації виробничих, складських і переробних потужностей з метою підвищення конкурентоспроможності аграрного сектору економіки України та створення умов для збалансованого розвитку диверсифікованих інноваційних виробничих структур як самої аграрної галузі, так і технологічно пов'язаних з нею видів економічної діяльності. Критично проаналізовано існуюче нормативно-методичне забезпечення процесу оцінювання ефективності інвестиційно-інноваційних проектів, реалізованих на засадах державно-приватного партнерства в аграрному секторі національної економіки, а також запропоновано авторський підхід до декомпонування індикативно-показникового базису визначення ефективності таких проектів як елементу забезпечення збалансованості системи інвестиційних відносин між державним та приватним партнерами в аграрній галузі.

Ключові слова: інноваційний розвиток; аграрна галузь; інвестиційно-інноваційні проекти; показники ефективності інвестицій; державно-приватне партнерство.

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Нина М. Петруха, Сергей В. Петруха
ОЦЕНКА ЭФФЕКТИВНОСТИ ИНВЕСТИЦИОННО-ИННОВАЦИОННЫХ ПРОЕКТОВ НА ОСНОВЕ ГОСУДАРСТВЕННО-ЧАСТНОГО ПАРТНЁРСТВА В АГРАРНОМ СЕКТОРЕ ЭКОНОМИКИ УКРАИНЫ

В статье раскрыты возможности государственно-частного партнерства как элемента обеспечения институциональной способности дальнейшего обновления и модернизации производственных и перерабатывающих мощностей с целью повышения конкурентоспособности аграрного сектора экономики Украины и создания условий для сбалансиро-

[1] Academy of Financial Management, Ministry of Finance Ukraine, Kyiv, Ukraine.
[2] Academy of Financial Management, Ministry of Finance Ukraine, Kyiv, Ukraine.

ванного развития диверсифицированных инновационных производственных структур как самой аграрной отрасли, так и технологически связанных с ней видов экономической деятельности. Дан критический анализ существующего нормативно-методического обеспечения процесса оценки эффективности инвестиционно-инновационных проектов, реализованных на основе государственно-частного партнерства в аграрном секторе национальной экономики. Предложен авторский подход к декомпонированию индикативно-показательного базиса определения эффективности таких проектов как элемента обеспечения сбалансированности системы инвестиционных отношений между государственным и частным партнёрами в аграрной отрасли.

Ключевые слова: инновационное развитие; аграрная отрасль; инвестиционно-инновационные проекты; показатели эффективности инвестиций; государственно-частное партнерство.

Problem statement. Today's military intensive situation in Ukraine serves for many as the excuse of reformatory processes slowdown. However, external threats in essence can't be the reason for internal reforms absence. It is doubtful whether state concentration on searching and attracting foreign assistance is reasonable when at the same time the state fails to provide extremely necessary system reforms.

Retracing the etymology of the word "reform", we have to emphasize the characteristic and evolution of "public-private partnership" (PPP) as one of the keyword for Ukrainian reformation vocabulary. The definition "partnership" appeared at the normative-legal articles, including bipartite declarations, and treaties while Ukraine was getting its independence. The important role in PPP development has been played by the Declaration and activities programme of the UN Millennium Forum (2000), Okinawa charter of Global Information Society (2000), European Council Resolution # 1698 (2005) on support of rural territories, Association Agreement between Ukraine and European Union (2014) etc. International practice in general considerably influenced the programme documents of domestic agrarian sector development, including the State target programme of Ukrainian rural areas development till 2015, the Strategy of agrarian sector development till 2020, the State strategy of regional development till 2020 etc. Designated by the Strategy of Ukrainian stable development till 2020 comprehensive reformation of state regulation and economic management system means simultaneous reforms in agriculture with the synchronous PPP provision. Under such conditions we have to remember the retrospective review of this issue and world practice which proves that agrarian innovative improvement, as usual, causes considerable resistance from the great part of participants, who risk, losing the privileged position or potential income.

Insufficient attempts of PPP activation in agrarian sector are explained by subject matter fundamentality, because it concerns all object and subject aspects of human being and its existence. That's why urgent becomes the necessity to study world experience of state and business structures interrelations in agrarian sector, analysis of socioeconomic, normative-legal and organizational components of partnership relations between state and business, and also elaboration of special mechanisms of their interaction. On the one hand, these mechanisms will provide the state responsibility for the environment and forms of entrepreneurship development, and, on the other raise the business social responsibility for activity results and their active part in socioeconomic development of the country. In turn, this requires the forma-

tion of corresponding institutional basis for such interrelation and application-oriented mechanisms of efficiency evaluation for investment-innovative projects (IIP) in agrarian sector, and this specifies the actuality of the given research topic.

Recent research and publications analysis. The important contribution to the study in state and business interrelation development was made by well-known foreign scientists-economists: D. Audretsch et al. (2002), R. Ball et al. (2002), F. Basanes and R. Willig (2002), C. Greve (2003), C. Harris (2003), S. Osborne (2000), E. Yescombe (2007) and others. Particular issues of PPP development, especially in the light of efficiency evaluation of IIP were recently explored by Ukrainian scientists such as: V. Heyets (2009), S. Hryshchenko (2011), K. Pavluk and S. Pavluk (2010), P. Shylepnytskyi (2011), B. Vinnytskyi et al. (2008), T. Yefymenko et al. (2012) and others. In agro sphere, especially: Y. Lupenko et al. (2014), P. Sabluk et al. (2011), P. Sabluk (2012) and some others have been considering the related issues.

But in spite of a great number of publications and scientific research, the subject matter of IIP efficiency evaluation, realized through PPP is fragmentary investigated and needs further development of applied methodologies. This could be effective for the Working group # 6 which develops the project of United complex strategy of agriculture and rural territories development for 2015–2020, as initiated by the Ministry of Agrarian Policy and Food of Ukraine and positioned by it as "communication map" of short- and medium-term transformations realization in the agrarian sector.

Research objectives is to provide scientific-theoretical substantiation of IIP efficiency evaluation mechanism, realized on the basis of PPP in Ukrainian agrarian sector.

Key research findings. Markets globalization, new competition paradigm, consumer expectations transformation against the background of eurointegration processes require conceptually new approaches to the country's agrarian sector competitive ability in contrast to the one, declared in the Strategy of agriculture development until 2020, approved by the Cabinet of Ministers of Ukraine as of 17.10.2013 # 806-r (further – Strategy). Under continuous environment changes the significance of system's competitiveness rises. Competitive internal conditions include owning unique recourses, knowledge, competences, technologies, forming certain competitive advantages. That's why the need to use such an instrument as PPP became crucial, and can contribute to initiative, investment, innovative development of the agrarian sector.

The fundamental document, defining the general conditions of PPP realization, is the Law of Ukraine "On public-private partnership" as of 01.07.2010 # 2404-VI, tactical-strategic mechanisms of its development at medium-term perspective are defined by the Cabinet of Ministers of Ukraine direction "On approval of the Concept of public-private partnership development for the period 2013–2018" as of 14.08.2013 # 739-r, and investment activity in general is determined by the Law of Ukraine "On investment activity" as of 18.09.1991 # 1560-XII. All of them a priori are directed on investment-innovative activity stimulation and investors' rights protection, particularly in the agrarian sector.

Making a decision on a possibility of IIP realization, in the first place raises the need to determine its efficiency. Usually, the classical indicator for investment efficiency is profit norm, which in original is a profit and capital correlation; capital in

turn is placed into permanent assets and circulating assets, stipulated, in the process of its functioning, into profit formation. During the period of market relations establishment for this particular indicator the range of oversights becomes typical, which don't allow evaluating impartially investment efficiency, corresponding to the market environment of placed capital.

We note the typical lack of the classical indicator of investment efficiency definition. Particularly, it doesn't take into account the lag of investment capital income, because profit is formed from the investment object output to the full capacity. Besides, profit volume may vary in years. The analyzed indicator also doesn't take into account changes in capital value in time. Taking in account the necessity of itemized shortages remedial actions of classical criterion of investment efficiency with regard to market conditions and economic management, the dynamic indicators of invested capital efficiency evaluation have been worked out by economists from different countries.

These indicators were adapted to Ukraine's circumstances in 1997 and regulated by the fundamental document "Methodology of business plans formation", approved by the Decree of Agency on problems of bankruptcy prevention of enterprises and organizations as of 21.04.1997 # 56. Under this methodology its normative and legal transformations and correspondent departmental gradation it is rather difficult to choose the optimal IIP from the number of possible alternatives, because, per se, all total scores from different sides (which is proved by their different units of measurement) characterize the efficiency from the project recoupment point of view.

It differentiates the project efficiency in general and efficiency of participation in a project.

The IIP efficiency in total is evaluated with the aim to define probable participators and search for financing from potentially attracted participants of IIP in the agrarian sector of the national economy (Figure 1).
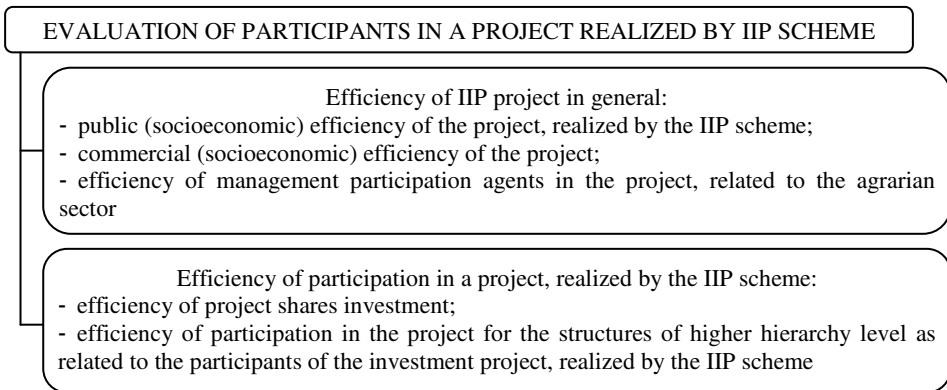

EVALUATION OF PARTICIPANTS IN A PROJECT REALIZED BY IIP SCHEME

Efficiency of IIP project in general:
- public (socioeconomic) efficiency of the project, realized by the IIP scheme;
- commercial (socioeconomic) efficiency of the project;
- efficiency of management participation agents in the project, related to the agrarian sector

Efficiency of participation in a project, realized by the IIP scheme:
- efficiency of project shares investment;
- efficiency of participation in the project for the structures of higher hierarchy level as related to the participants of the investment project, realized by the IIP scheme

Figure 1. **Evaluation of IIP participation efficiency,** *authors'*

The efficiency of IIP participation in the agrarian sector, to our mind, is the most debative issue. IIP efficiency in the mentioned sector is defined to verify the performability of a particular project and all its participants' interest in it. To evaluate the IIP efficiency different approaches are used by economists (Harris, 2003; Yescombe,

2007). Nowadays, to evaluate IIP efficiency, realized under PPP schemes, one can apply:

1) the criteria of economic efficiency of strategic IIP evaluation, with the classical method of money circulation discounting for investment projects efficiency calculation;

2) IIP efficiency evaluation by to the model of "input-output";

3) IIP efficiency evaluation on the basis of cost-based money currents.

According to the key approaches, the selection criteria are:

1) investor presence, who confirmed the readiness to participate in an innovative project realized through PPP schemes;

2) expected effect from innovative development due to IIP realization in the agrarian sector realized through PPP scheme;

3) during the project realization, the current tasks must correspond to the objectives of socioeconomic development of Ukraine and strategic documents of the top level;

4) the impossibility of IIP realization in the agrarian sector, under PPP scheme, without budget spending.

Projects, which correspond to the selection criteria of economic effectiveness, mentioned in the Strategy, have to be evaluated and analyzed on the basis of financial, budget and economical efficiency characteristics. This allows estimating the IIP contribution to socioeconomic activities of Ukraine's agrarian sector. This assessment should be implemented on the basis of IIP financial model, and calculation of the main indicators of project efficiency.

One of the most important indicators of IIP efficiency evaluation in the agrarian sector is net present value. IIP net present value in the agrarian sector is calculated by the following formula (Audretsch et al., 2002):

$$NPV = FCF_0 + \sum_{t=1}^{T} \frac{FCF_1}{P_{i=1}^t(1+WACC_t)} + \frac{V_t}{P_{i=1}^t(1+WACC_t)}, \qquad (1)$$

where NPV is IIP net present value in the agrarian sector, implemented by PPP scheme; FCF_t — current financing of the project at period t; FCF_0 — financial flow at the beginning of IIP implementation in the agrarian sector, realized by PPP scheme; $WACC_t$ — weighted average capital cost with of IIP discounting; V_t — valuation of assets cost, developed in the course of IIP implementation; P — IIP cost parameter; t — period (year, quarter); T — number of the last period.

Calculations of the intrinsic norm of IIP profitability in the agrarian sector, realized through PPP scheme, is based on the IRR indicator, satisfying the equation:

$$NPV(IRR) = 0 \leftrightarrow FCF_0 + \sum_{t=1}^{T} \frac{FCF_1}{(1+IRR)^t} + \frac{V_t}{(1+IRR)^T}, \qquad (2)$$

where NPV is IIP profitability norm in the agrarian sector; IRR — profitability intrinsic norm; $\sum_{t=1}^{T}$ — sum (volume, term) of discounted financial flow of the last investment period.

The weighted average capital cost of IIP in the agrarian sector, realized through PPP scheme, is calculated by the following formula:

$$WACC_t = r_e^t \times \frac{E_t}{D_t + E_t} \times r_d^t \times \frac{D_t}{D_t + E_t}, \qquad (3)$$

where r_e^t is weighted average cost of own capital e IIP in agrarian sector, realized through PPP scheme, at the beginning of period t; r_d^t — weighted average cost of loan capital d IIP at the beginning of period t; E_t — the volume of own capital at the beginning of period t IIP; D_t — the volume of loan capital sources at the beginning of period t IIP.

IIP in the agrarian sector could be recognized as effective and attractive for investments if the corresponding financial efficiency criterion are corroborated by positive project net present values; and the internal rate of return exceeds the weighted average cost of IIP capital during the period of investment:

$$WACC_t = \frac{\sum_{t=1}^{T} WACC_t \times (E_t + D_t)}{\sum_{t=1}^{T} (E_t + D_t)}, \qquad (4)$$

where $\sum_{t=1}^{T}$ - the sum (volume, term) of the investment period.

Apart from the indicator of net present value of the IIP in agrarian sector and the norm of its profitability the period of IIP recoupment is also calculated, along with specific financial efficiency of IIP. IIP budget efficiency is evaluated by comparing the volume of external investments into the given project and all budget allocations provided to support the competitive positions of national agrarian sector.

Calculating of discounted budget flow, generated by IIP in the agrarian sector at period t is done the following way:

$$BCF_t = \frac{TCF_t^{dir} + TCF_t^{indir} + EBE_T + NonTax\,Rev_t}{(1+F)^t}, \qquad (5)$$

where BCF_t is discounted budget flow generated by IIP under PPP scheme; TCF_t^{dir} — direct tax of t, period, stipulated by IIP implementation; tax proceeds at different levels of budgets during the t period directly in agribusiness; TCF_t^{indir} — indirect tax of t period, stipulated by IIP implementation; tax proceeds at different levels of budgets during the t period from economical entities which are not investors or participators of IIP; EBE_T — the economy of state budget expenses at the t period as a result of IIP implementation; $NonTaxRev_t$ — revenues from using state support funds of implemented IIP (this indicator is calculated against the volume of state participation in the project).

As an indicator of IIP budget efficiency in the agrarian sector, realized by PPP scheme, we could also use the index of budgetary efficiency (*PI*):

$$PI = \frac{\sum_{t=1}^{T} BCF_t}{Inv^{IF}}, \qquad (6)$$

where PI — is the index of budgetary efficiency of the project; BCF_t — discounted budget flow, generated by IIP; Inv^{IF} — dimensions and volumes of IIP state resources use including governmental insurance arrangements.

IIP is considered as corresponded to budget efficiency criterion if PI exceeds "1". Providing governmental support in the way of directing the resources into the capital of corporate bodies and in the form of financing investment projects also adds to the required profitability of capital investment at different budget levels.

This approach to IPP efficiency evaluation at the sectoral level, considered hereinabove, and gives the possibility to define the state of affairs distribute profits fairly between project partners. The mentioned models don't give the possibility to determine the direct relation between private partner profit and the volume of agricultural project functioning.

Conclusions. Taking into consideration mentioned above, we can note that at present an efficient approved normative is absent at the sectoral level. Nothing regulates the relations of PPP participants in the agrarian sector of Ukraine, and the mechanism of profit allocation according to final results of IIP realization. Under Ukraine's integration into the European Union for potential investors in agriculture, as a rule, it is important to define the efficiency of own funds, invested in IIP. The introduced indicators could be used as an addition to the methodology currently in force; they are the element of perspective development of IIP efficiency in Ukrainian agrarian sector and its objective appraisal.

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