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## MODERN APPROACHES IN THE METHOD OF ANALYSIS OF FIXED ASSETS AGRICULTURAL BUSINESS ENTERPRISES

### ABSTRACT:

Implementation of strategic and current tasks of operational management is impossible without the use of appropriate production capacity. An important place in its structure is occupied by fixed assets. Due to their availability and use in accordance with the production program, a resource base is formed to increase production, provide services or perform work, diversify them, improve quality characteristics. This contributes to gaining significant advantages in ensuring the competitiveness of the enterprise and its products. To reveal the purpose and objectives of the research, the article uses general scientific (analysis, synthesis, induction, deduction) and special research methods (system approach, graphical method, comparative analysis, modeling). The scientific article examines the existing methods of analysis of fixed assets. Its critical assessment is given, the shortcomings of use in the conditions of market economy and information needs of managers and investors of agrarian business enterprises are pointed out. Theoretical and methodological principles of improving the analysis of fixed assets of agricultural enterprises are formulated. A model of the methodology of analysis of fixed assets in the system of real investment management is proposed. To reveal the content of the proposed method, the practical aspects of the implementation of the method of analysis of fixed assets in the management of real investments of agricultural enterprises are considered. Analytical indicators for information support of management of each stage of real investment (at the stage of real investment planning and the stage of realization of investments in fixed assets of agricultural enterprise) are identified.

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### INTRODUCTION.

Since fixed assets are used in many business processes of the enterprise and types of operations (activities), it is necessary to provide effective analytical support for their management. The method of economic analysis of the composition, condition and efficiency of the use of fixed assets has been formed for a long time and has its origins in the period of the socialist economy. This period was characterized by technical and economic analysis of fixed assets. Significant attention to improving the analytical support of fixed assets management in agriculture was paid by scientists A.A. Bugutsky, G.A. Kobzar,

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G.Y. Kozak, G.T. Leshchenko, G.V. Postnikova, V.K. Savchuk, R.I. Trynko, V.V. Yurchyshyn, M.I. Yatskiv. However, the current organizational structure of most Ukrainian enterprises does not provide a large number of economists and analysts who can perform such an analysis. Researches of N.A. Volkova, O.V. Zinkevych, E.V. Mnykha, O.V. Oliynyk, I.M. Parasiy-Vergunenko, S.I. Shkarabana are devoted to the development and development of methods of analysis of fixed assets. However, today it is important to conduct financial and investment analysis, as fixed assets are the objects of real investment. For these reasons, the method of analysis of fixed assets on a new paradigmatic basis needs to be significantly improved. The purpose of the article is to substantiate the theoretical and methodological principles of improving the analytical support of fixed assets management in the system of real investment.

## THEORETICAL AND METHODOLOGICAL PRINCIPLES OF IMPROVING THE ANALYSIS OF FIXED ASSETS OF AGRICULTURAL ENTERPRISES.

The agricultural sector of Ukraine's economy plays a significant role in solving basic socio-economic problems, in achieving sustainable development goals. Agribusiness products provide food needs not only in the domestic market, but also have a very significant export potential. Therefore, an important task of agricultural enterprises is to grow competitive, quality products. Realization of this task is impossible without effective management, including investments, because the quantitative and qualitative parameters of agricultural production depend on their validity and direction. Domestic enterprises are characterized by the predominance of real investments in the structure of investment - namely - in fixed assets. Therefore, the urgent theoretical and methodological task is to improve the analytical management of fixed assets as objects of investment.

To do this, consider the existing approaches to the methodology of analysis of fixed assets of agricultural enterprises (Table 1).

Table 1

### System of indicators of analysis of fixed assets of agricultural enterprises

| Indexes                                                              | [1] | [2] | [3] | [4] | [5] |
|----------------------------------------------------------------------|-----|-----|-----|-----|-----|
| Machine-day utilization rate (variability ratio)                     |     |     |     |     |     |
| The percentage of use of the regime fund of tractor-changes          |     |     |     |     |     |
| The level of mechanization of basic agricultural work in agriculture |     |     | +   |     |     |
| Volume of freight (ton / km)                                         |     |     |     |     |     |



Table 1 (continued)

| Indexes                                                                                                                           | [1] | [2] | [3] | [4] | [5] |
|-----------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|
| The structure of costs for the operation of the tractor fleet                                                                     | +   |     |     |     |     |
| Labor capital                                                                                                                     |     | +   | +   |     |     |
| Technological armament of labor.                                                                                                  |     | +   |     |     |     |
| Capital intensity                                                                                                                 |     | +   |     |     |     |
| Indicator of farm debt by tractors in physical units                                                                              |     | +   |     |     |     |
| The figure in conventional units in terms of the standard tractor per 100 hectares of arable land                                 |     | +   |     |     |     |
| Load of crops on a physical tractor (combine, plow, cultivator)                                                                   |     | +   |     |     |     |
| Loading of crops on the reference tractor (combine, plow, cultivator)                                                             |     | +   |     |     |     |
| Number of agricultural machinery and implements to perform the planned amount of work (in the reference calculation and by brand) |     | +   | +   |     | +   |
| Production of gross crop and livestock products per 1 unit of cost of machinery                                                   |     | +   |     |     |     |
| Revenues (profit) per unit cost of equipment                                                                                      |     | +   |     |     |     |
| Energy equipment of the farm                                                                                                      |     | +   | +   |     | +   |
| Energy of labor                                                                                                                   |     | +   | +   |     | +   |
| Coefficient of extensive use of tractor fleet and combines (in time)                                                              |     | +   | +   |     | +   |
| Coefficient of intensive use of tractor fleet and combines (by capacity)                                                          |     | +   | +   |     | +   |
| Percentage of performance by tractors of seasonal and variable norms on quantity and quality of works and terms                   |     | +   |     |     |     |
| The cost of tractor work                                                                                                          |     | +   |     |     |     |
| The cost of 1 hectare of harvesting                                                                                               |     | +   |     |     |     |
| Coefficient of integration (full) load of the machine-tractor fleet                                                               |     |     | +   |     |     |
| The level of mechanization of the technological process is possible                                                               |     |     |     | +   |     |
| The degree of intensity of renewal of fixed assets                                                                                |     |     |     | +   |     |
| Indicators of investment structure                                                                                                |     |     |     | +   |     |
| Indicators of funding sources                                                                                                     |     |     |     | +   |     |
| Indicators of implementation of the capital investment plan                                                                       |     |     |     | +   |     |
| Performance indicators for capital construction of facilities                                                                     |     |     |     | +   |     |
| Performance indicators of fixed assets formation                                                                                  |     |     |     | +   |     |
| Expenses for capital repairs of fixed assets                                                                                      |     |     |     | +   |     |
| Occupancy of livestock facilities                                                                                                 |     |     |     | +   | +   |

Table 1 (continued)

| Indexes                                                                                                                                                                                                                                                        | [1] | [2] | [3] | [4] | [5] |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|
| Use of the area of the main production of livestock facilities                                                                                                                                                                                                 |     |     |     | +   |     |
| Number of seats per 1 m <sup>2</sup> of floor                                                                                                                                                                                                                  |     |     |     | +   |     |
| Average annual occupancy                                                                                                                                                                                                                                       |     |     |     | +   |     |
| Terms of introduction of new areas                                                                                                                                                                                                                             |     |     |     | +   |     |
| Yield of livestock products per 1 m <sup>2</sup> of production area of livestock premises                                                                                                                                                                      |     |     |     | +   |     |
| The level of return on the productive potential of productive animals                                                                                                                                                                                          |     |     |     | +   |     |
| Breeds (lines) of animals                                                                                                                                                                                                                                      |     |     |     | +   |     |
| Health, productive age of animals                                                                                                                                                                                                                              |     |     |     | +   |     |
| Feed and drinking water                                                                                                                                                                                                                                        |     |     |     | +   |     |
| Gross output at comparable prices:<br>- per unit of land area (relevant land);<br>- per 1 m <sup>2</sup> of production area of the main industry;<br>- 1 (100, 1000 rubles) of the value of fixed assets of the industry;<br>- per 1 employee of the industry. |     |     |     | +   |     |
| Production of basic types of products per 1 m <sup>2</sup> of production area                                                                                                                                                                                  |     |     |     | +   |     |
| Growth in gross output                                                                                                                                                                                                                                         |     |     |     |     |     |
| The degree of development of the project production capacity for the production of basic products                                                                                                                                                              |     |     |     | +   |     |
| Unit cost:<br>- profit per unit of production area<br>- profit from 1 head of animals                                                                                                                                                                          |     |     |     | +   |     |
| The level of profitability of production                                                                                                                                                                                                                       |     |     |     | +   |     |
| Return on capital investment in the industry                                                                                                                                                                                                                   |     |     |     | +   |     |
| Technological efficiency of fixed assets                                                                                                                                                                                                                       |     |     |     | +   |     |
| Economic efficiency of fixed assets                                                                                                                                                                                                                            |     |     |     | +   |     |
| Economic efficiency of capital investments                                                                                                                                                                                                                     |     |     |     | +   |     |
| Environmental effect                                                                                                                                                                                                                                           |     |     |     | +   |     |

[formed by the author]

According to Table 1, most Ukrainian scientists-analysts in the field of agriculture preferred quantitative - technical and economic indicators of the composition and use of fixed assets. Only G.A. Kobzar, G.Ya. Kozak, G.T. Leshchenko, V.K. Savchuk and V.V. Yurchyshyn suggested in the process of analysis to study the cost indicators related to the costs and results of the use of fixed assets:

- production of gross output of crop and livestock at the rate of 1 unit of cost of equipment;
- income (profit) per unit cost of equipment;

- cost of tractor works;
- cost of 1 ha of harvesting;
- costs of overhaul of fixed assets;
- profit from 1 head of animals.

However, in the process of assessing the quality of investment decisions, according to our research, preference should be given to cost indicators and ratios as more visual and representative, as well as take into account the information requests of stakeholders. Taking into account these considerations, the method of analysis of fixed assets in the investment management system should include the blocks shown in Fig.1.

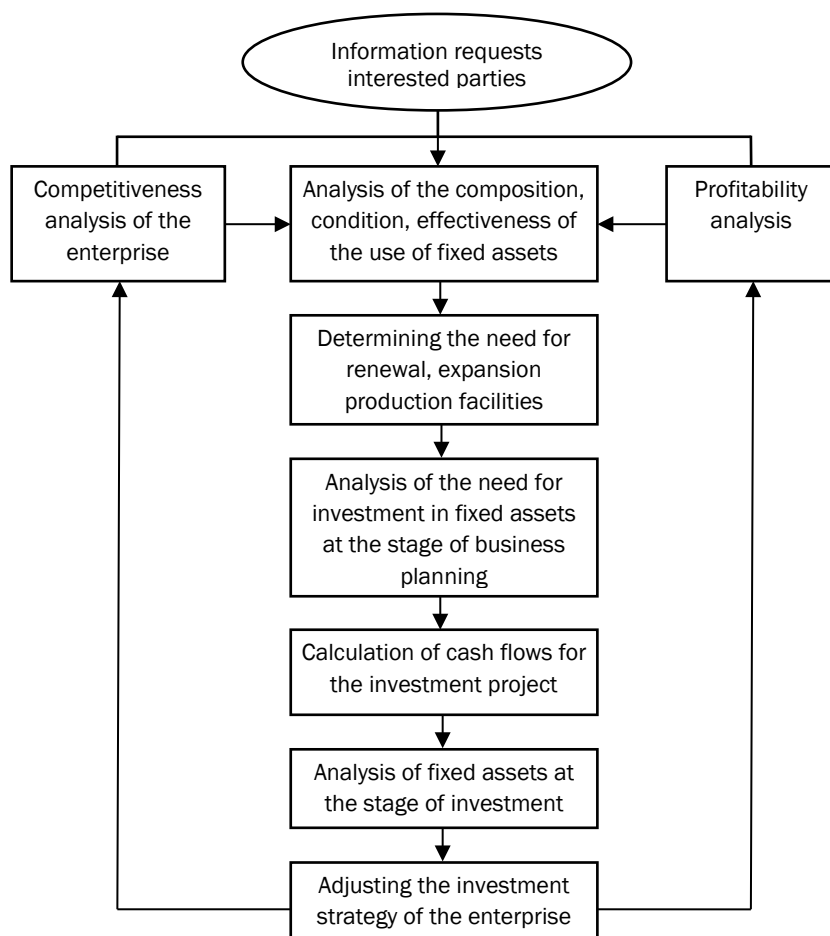


Fig. 1. Model of methods of analysis of fixed assets in the system of real investment management

The analysis and its content should be preceded by the formulation of information needs of investors (company management). Next, the assessment of the competitiveness of both the agricultural enterprise as a whole and individual products. Given the negative trends in the dynamics of income and operating profit, one of the factors of which was to reduce the efficiency of fixed assets, increasing the level of their extensive use and technical condition and operation, the need to update, expand, modernize fixed assets and investment resources needs at the stage of business planning (investment project development).

Next, it is necessary to analyze the effectiveness of the use of fixed assets at the stage of investment and, if necessary - adjust the investment project or investment strategy of the enterprise as a whole.

The analysis of fixed assets according to the system approach is not an end in itself, it is necessary to assess the effectiveness of investment, as well as to determine the production capacity and its effectiveness to increase the competitiveness of products and enterprises as a whole.

## **PRACTICAL ASPECTS OF THE IMPLEMENTATION OF THE METHODOLOGY OF ANALYSIS OF FIXED ASSETS IN THE MANAGEMENT OF REAL INVESTMENTS.**

At each stage of the analysis it is necessary to organize the formation of an information base for the calculation and evaluation of the dynamics of relevant indicators. Thus, at the stage of planning the volume of real investment (business project development) analysis of the need for investment in fixed assets should be conducted on the dynamics of the following indicators:

- average annual cost of fixed assets;
- profitability of fixed assets on income from operating activities;
- the coefficient of operation of fixed assets
- net income from sales of products, goods, works, services.

Comparing the dynamics of these estimates makes it possible to determine the economic basis of the need for real investment and their targeting.

Table 2 calculates the dynamics of the estimated indicators of the need for real investment in fixed assets at the planning stage in PJSC "Ivano-Frankivsk Breeding Enterprise" for 2016-2020.

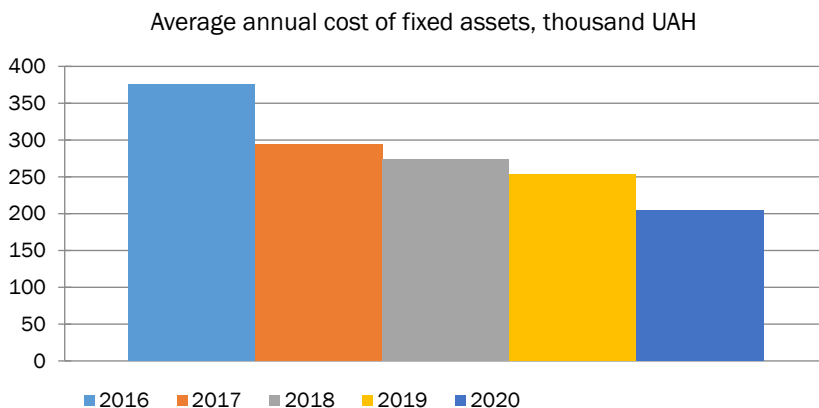
According to Table 2, there is a negative trend to reduce the value of fixed assets - for the analyzed period 2016-2020. it decreased by UAH 171.1 thousand, ie by 33%.

Table 2

**Analysis of the need for real investment in fixed assets at the planning stage in PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020**

| Indexes                                                                  | 2016  | 2017  | 2018   | 2019  | 2020  | 2017/<br>2016 | 2018/<br>2017 | 2020/<br>2016 |
|--------------------------------------------------------------------------|-------|-------|--------|-------|-------|---------------|---------------|---------------|
| Net income from sales of products (goods, works, services), thousand UAH | 934,8 | 759,9 | 1115,1 | 735,3 | 626,7 | -174,9        | 355,2         | -308,1        |
| Financial result of operating activities, thousand UAH                   | 4,2   | 5,1   | 8,5    | 2,1   | 1,9   | 0,9           | 3,4           | -2,3          |
| Average annual cost of fixed assets, thousand UAH                        | 375,6 | 294,2 | 273,5  | 252,7 | 204,5 | -81,4         | -20,7         | -171,1        |
| Return on fixed assets by operating income, %                            | 1,12  | 1,73  | 3,11   | 0,83  | 0,93  | 0,61          | 1,38          | -0,19         |
| Depreciation amount, thousand UAH                                        | 286,1 | 288,2 | 236,6  | 242,4 | 197,7 | 2,1           | -51,6         | -88,4         |
| The coefficient of operation of fixed assets, UAH / UAH                  | 0,762 | 0,98  | 0,865  | 0,96  | 0,97  | 0,218         | -0,115        | 0,208         |

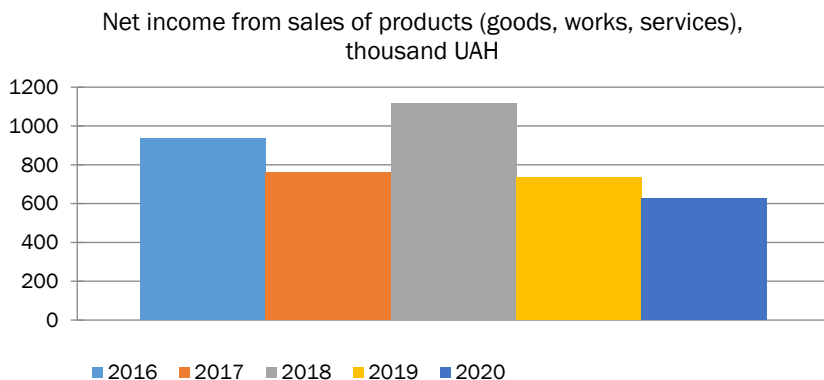
Such a significant decrease was due to reduced demand for products. Net income from sales of products (goods, works, services) of PJSC "Ivano-Frankivsk Tribal Enterprise" for the period 2016-2020. decreased by 308.1 thousand UAH, ie also by 33%. Figure 2 shows the dynamics of the average annual value of fixed assets of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020.



**Fig.2 Dynamics of the average annual value of fixed assets of PJSC "Ivano-Frankivsk breeding enterprise" for 2016-2020**

Thus, there is a steady trend to reduce the production potential of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020, due to falling demand for the company's products, their low quality, shrinking markets. That is, the need for real investment in modern equipment and technology is significant and a priority of investment policy of the enterprise.

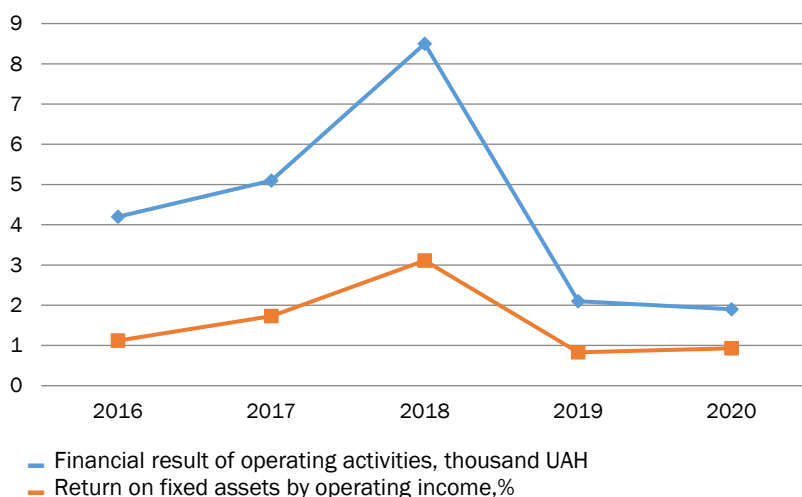
Consider in more detail in Figure 3 the dynamics of net income from sales of products (goods, works, services) PJSC "Ivano-Frankivsk Breeding Enterprise" for 2016-2020.



**Fig.3 Dynamics of net income from sales of products (goods, works, services) PJSC "Ivano-Frankivsk tribal enterprise" for 2016-2020**

According to Fig. 3, there is also a steady trend (except for 2018) to reduce net income from sales of products (goods, works, services) PJSC "Ivano-Frankivsk Tribal Enterprise" for the reasons mentioned above. The company should completely review its product range policy and look for new markets or expand its presence to existing ones through new competitive products.

Directly related to the dynamics of net income is the dynamics of financial results and profitability of fixed assets of PJSC "Ivano-Frankivsk Tribal Enterprise" (Fig. 4). If before 2018 at PJSC "Ivano-Frankivsk Tribal Enterprise" there was an increase in operating profit - by 4.3 thousand UAH, ie the growth rate was 202.4% compared to 2016, the following years are characterized by a significant decrease in profit from operating activities - by 77%, which leads to failure to achieve strategic goals of the enterprise, reducing social programs for employees.

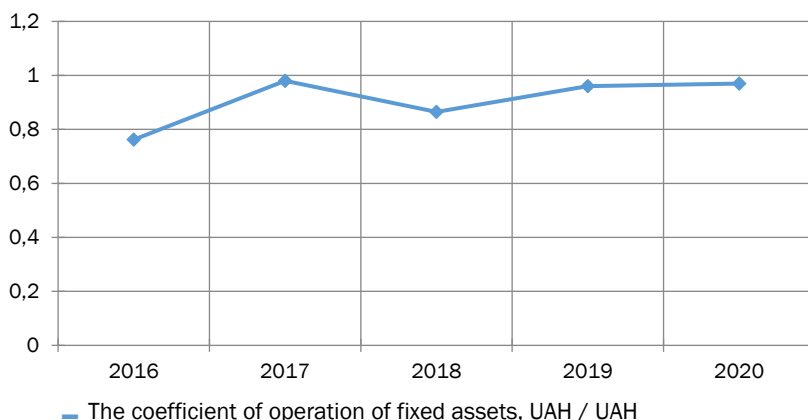


**Fig.4 Dynamics of financial results and profitability of fixed assets of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020**

Against this background, logically, there was a decrease in the profitability of fixed assets in profit from operating activities - by 70.1 from the level of 2018.

To form a business plan for the reorientation of technology to a modern, innovative, higher level of targeting of real investment, it is also necessary to assess the level and trends in the operation of fixed assets of the studied

enterprise. In Fig. 5 shows the dynamics of the coefficient of operation of fixed assets of PJSC "Ivano-Frankivsk breeding enterprise" for 2016-2020.



**Fig.5 Dynamics of the coefficient of operation of fixed assets of PJSC "Ivano-Frankivsk breeding enterprise" for 2016-2020**

According to Fig.5 and Table 2, there is a catastrophic state of wear and tear of fixed assets of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020 - an average of 90.7% over 5 years. Moreover, the increase in negative trends is observed throughout the study period - from 76.2% in 2016 - to 97% in 2020. That is, without real investment in fixed assets, the company will not be able to fully carry out its operations, possible accidents and equipment breakdowns, increasing the level of injuries to employees, deteriorating product quality.

At the stage of investment implementation, analytical tools for decision-making should include evaluation indicators:

- net income from sales of products, goods, works, services;
- net income per UAH 1 of fixed assets;
- profit from operating activities per UAH 1 of fixed assets;
- average annual cost of fixed assets;
- the share of fixed assets in the value of the property of the enterprise;
- capital intensity and return on capital;
- market value of the enterprise (by property approach);
- the share of fixed assets in the market value of the enterprise.

Table 3 shows the calculation of the dynamics of the main estimates at the stage of realization of real investments on the example of the private joint-stock company "Ivano-Frankivsk Tribal Enterprise" for 2016-2020.

Table 3

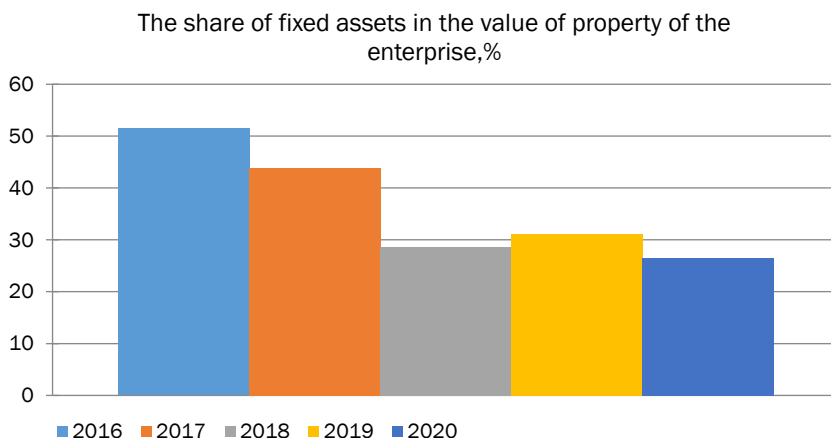
**Analysis of fixed assets at the stage of realization of real investments in the private joint-stock company "Ivano-Frankivsk tribal enterprise" for 2016-2020**

| Indexes                                                                  | 2016  | 2017  | 2018  | 2019  | 2020  | 2017/<br>2016 | 2018/<br>2017 | 2020/<br>2016 |
|--------------------------------------------------------------------------|-------|-------|-------|-------|-------|---------------|---------------|---------------|
| Average annual cost of fixed assets, thousand UAH                        | 375,6 | 294,2 | 273,5 | 252,7 | 204,5 | -81,4         | -20,7         | -171,1        |
| Property value, thousand UAH                                             | 729,7 | 671,8 | 956,8 | 812,0 | 772,3 | -57,9         | 285           | 42,6          |
| The cost of fixed assets that provide operating activities, thousand UAH | 375,6 | 294,2 | 273,5 | 252,7 | 204,5 | -81,4         | -20,7         | -171,1        |
| Capital intensity of production, UAH / UAH                               | 0,402 | 0,387 | 0,245 | 0,344 | 0,326 | -0,015        | -0,142        | -0,076        |
| Return on capital, UAH/UAH                                               | 2,489 | 2,583 | 4,077 | 2,910 | 3,064 | 0,094         | 1,494         | 0,575         |
| The share of fixed assets in the value of property of the enterprise, %  | 51,47 | 43,79 | 28,58 | 31,1  | 26,5  | -7,68         | -15,21        | -24,97        |
| Net income per UAH 1 of fixed assets, UAH / UAH                          | 2,489 | 2,58  | 4,077 | 2,910 | 3,064 | 0,094         | 1,494         | 0,575         |
| Profit from operating activities per UAH 1 of fixed assets, UAH / UAH    | 0,011 | 0,02  | 0,031 | 0,008 | 0,009 | 0,006         | 0,014         | -0,002        |
| Net profit, thousand UAH                                                 | 4,2   | 4,2   | 7,0   | 1,7   | 2,4   | 0             | 2,8           | -1,8          |
| Net profit per UAH 1 of fixed assets, UAH / UAH                          | 0,011 | 0,01  | 0,026 | 0,007 | 0,012 | 0,003         | 0,012         | 0,001         |
| Market value of the enterprise (by property approach), thousand UAH      | 603,2 | 607,4 | 614,4 | 616,1 | 618,5 | 4,2           | 7             | 15,3          |
| Share of fixed assets in the market value of the enterprise, %           | 62,27 | 48,4  | 44,51 | 41,0  | 33,1  | -13,83        | -3,93         | -29,17        |

The data of Table 3 allow for analytical monitoring of estimated indicators at the stage of realization of real investments in fixed assets. An important methodological approach is to assess the dynamics of relative indicators - they provide a higher level of systematic research.

Thus, despite the generally negative trends identified in the process of preventive analysis - before making decisions on real investment in fixed assets, the dynamics of return on fixed assets - capital intensity and return on capital is positive - yes, return on investment from 2,489 UAH / UAH. in 2016 it increased to UAH 3,064 / UAH. in 2020, ie by 123.1%, and capital intensity, as an inverse indicator, decreased by UAH 0.076 / UAH, respectively.

In Fig. 6 there is a trend to reduce the share of fixed assets in the value of property of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020.



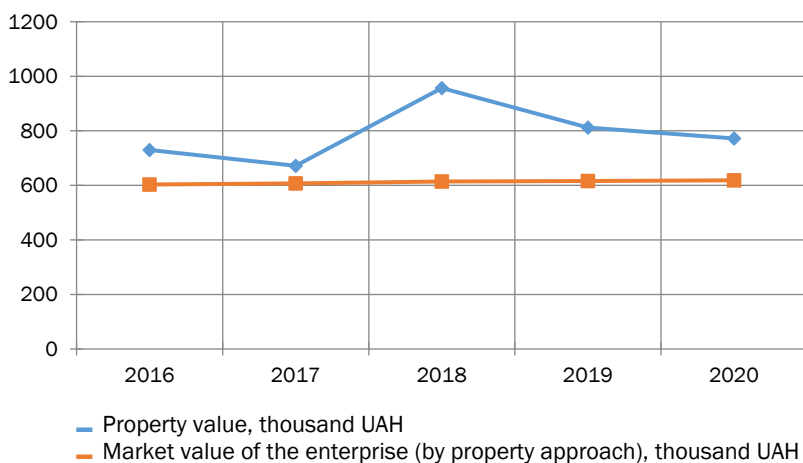
**Fig.6 Dynamics of the share of fixed assets in the value of property of PJSC "Ivano-Frankivsk Tribal enterprise" for 2016-2020**

Dynamics of the share of fixed assets in the value of property of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020 - has a steady downward trend - from 51.47% in 2016 to 26.5% in 2020 - ie if in 2016 fixed assets accounted for more than half of the value of the entire property of the enterprise - then in 5 years - only a quarter. Which is another economically sound evidence of the need for large-scale real investment to maintain their market position. At the same time, the comparison of the dynamics of this indicator with the rate of return shows an increase in operating load on very worn equipment, which

leads to increased costs for capital and current repairs and, consequently, reduce the company's profit.

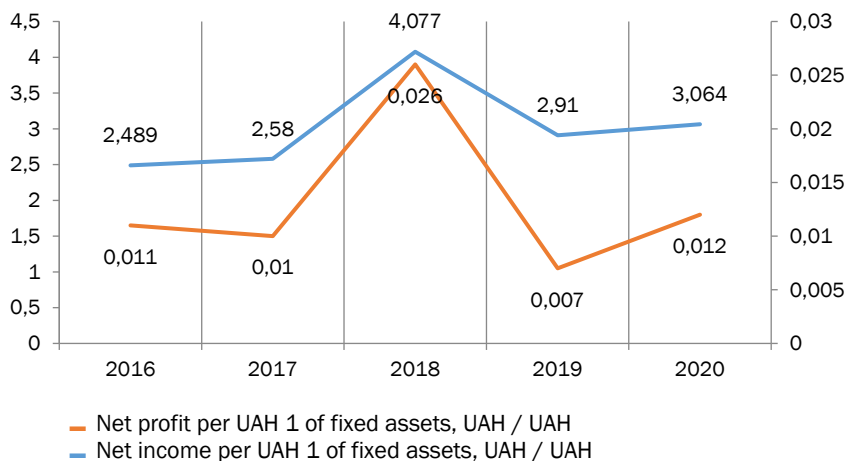
Also in the process of analysis it is necessary to assess trends in the value of property and market value of the studied joint stock company. Figure 7 shows the dynamics of property value and market value (according to the property approach) of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020. According to Fig. 7, the value of property changes unevenly, although for the period 2018-2020 there was a negative trend to reduce it - from 956.8 thousand UAH in 2018 to 772.3 thousand UAH in 2020, ie by 19.3%. At the same time, the tendency to a steady increase in market value (according to the property approach) is positive for the company and its shareholders. During the study period, it increased by 2.1%.

Although the share of fixed assets in the market value of the enterprise has also undergone sharp changes - from 62.27% in 2016 to 33.1% in 2020, ie decreased by 29.17 percentage points.



**Fig.7 Dynamics of property value and market value (by property approach) of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020**

Regarding the trends and nature of changes in net income and net income by 1 UAH fixed assets, according to a cautious forecast, they tend to increase - although this is due not to extensive but intensive use of fixed assets and the price factor in the causal relationship of income, profit and use of fixed assets (Fig. 8).



**Fig.8 Dynamics of net income and net profit for 1 UAH. fixed assets of PJSC "Ivano-Frankivsk Tribal Enterprise" for 2016-2020**

Thus, the use of the proposed method of analysis of fixed assets allows management and business owners to make more informed decisions about real investment and its effectiveness in the long run for the implementation of business strategy.

## CONCLUSION.

The research of theoretical and methodological bases of analytical support of fixed assets management in the system of real investment of agricultural enterprises allows to draw the following conclusions. Existing theoretical and methodological approaches and techniques are focused mainly on the assessment and diagnosis of technical and economic indicators of the state and use of fixed assets. They are very detailed due to the high level of diversification of agricultural business (crop production, animal husbandry, beekeeping, fishing, etc.). For micro and small enterprises due to limited economic staff, this technique is very time consuming and resource intensive. For the needs of real investment, the method of fixed assets analysis is recommended, which will consist of groups of evaluation indicators that most accurately reflect the state and efficiency of fixed assets and justify the feasibility of investing in stages: business project development and investment. The correctness and relevance of the proposed method of analysis on the example of the researched enterprise are considered.

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