

# The model of evaluation of efficiency of leasing services

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**Abstract.** At present, in the financial market, it is important to study the specifics of assessing the effectiveness of leasing services, in contrast to other alternative methods of financing investment projects. Increasing the volume of investment for the modernization of fixed assets through the leasing mechanism, further expanding its capabilities will be ensured by assessing the effectiveness of this activity. Thus, the purpose of the article is to develop methods for applying the methods of determining the effectiveness of this type of service for the lessee of the leasing operation, as well as a model of the classification of factors affecting it. To achieve this goal, the cash flows observed in the use of credit and leasing as methods of financing fixed assets for the lessee of the leasing operation were analyzed, and the impact of some of the indicators of financial stability of the lessee was assessed. Also, a comprehensive system for evaluating the methodological aspects of attracting financial resources for the modernization of enterprises through leasing was proposed.

## 1 Introduction

Leasing service emerges as a specific feature for the participants of this service, is the implementation of an investment project for the lessee, financial investment for the lessor and a sales mechanism for the seller (manufacturer). The complex economic and legal nature of leasing means that it is important for all parties to a lease agreement to evaluate its effectiveness.

In the special literature on leasing, the issues of evaluating the effectiveness of leasing from the point of view of one or another participant of the leasing relationship are discussed [1-5]. Particularly, specific aspects of evaluating the effectiveness of investment projects can be considered in two cases:

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- When the manufacturer (seller) sells the product on the basis of leasing terms at the price of lease payments. This situation is rare in the national leasing market and is observed in the early stages of leasing relationship management;
  - When the property is delivered on the terms of the lease directly through an intermediary, to be exact the lessor. In this case, the effectiveness of the investment project can be realized through the analysis of cash flows.
- Based on these considerations, the following specific aspects of a comprehensive assessment of the cost-effectiveness of leasing can be identified:
- Calculation of indicators for the efficiency of the sale of the object, using the leasing mechanism for the seller of the leased object;
  - Calculation of the efficiency of real investment for the lessee by two groups of indicators, in other words the indicators used in the comparison of leasing with respect to credit and alternative leasing projects;
  - Determining the profitability of leasing services and the effectiveness of financial investments, which are the basis of its activities for the lessor.

In contrast to other alternative methods of financing investment projects, it is important to study the specifics of assessing the effectiveness of leasing services. Increasing the volume of investment for the modernization of fixed assets through the leasing mechanism, further expanding its capabilities will be ensured by assessing the effectiveness of this activity. We can see that there are many methods and techniques for evaluating the effectiveness of leasing in today’s modern domestic and foreign scientific literature. Special websites for leasing activities also provide comparative methods for determining the effectiveness of leasing among alternative options for financing capital investments. In addition, many leasing companies offer a calculator for calculating lease payments on their websites, through which lessees can determine the effectiveness of the lease. However, there is no single way in science to determine the effectiveness of leasing.

Since the leasing service is a method of investing money to lease equipment, the scientific literature traditionally uses indicators used in the analysis of investment efficiency to determine its effectiveness (Table 1).

**Table 1.** A scholarly approach to evaluating the effectiveness of leasing

| The author, source |                 | Author's approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.                 | I.E.Krylov[6]   | <p>The author proposes the following formula for the implementation of "additional (comparative) calculation of the effectiveness of leasing in financing an investment project":</p> $S_{lqi}= S * K_{AN}- A - \frac{(LT-A):(100-F)}{100} - \frac{S * F}{M1 * 100} - \frac{Aqq}{M2} + \frac{S * SM}{2 * 100}$ <p> <math>S_{lqi}</math> - additional economic efficiency of leasing for 1 year compared to a bank loan;<br/> <math>S</math> - the amount of the loan provided by the bank for the purchase of equipment;<br/> <math>K_{AN}</math> - annuity coefficient reflecting the annual payments to the bank, taking into account the interest on the loan;<br/> <math>S * K_{AN}</math> - the amount of payments made annually to the bank in order to repay the loan and interest on it<br/> <math>LT</math> - annual amount of lease payment;<br/> <math>A</math> - the amount of annual depreciation;<br/> <math>F</math> - the income tax rate;<br/> <math>M1</math> - maturity of the bank loan, year;<br/> <math>Aqq</math> is the residual value of the equipment;<br/> <math>M2</math> - useful life of the equipment, years;<br/> <math>SM</math> - property tax rate,% </p> |
| 2.                 | V.V.Kovalev [7] | <p>The author considers the criteria for the analysis of investment activity in two types:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

|                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                              | <p>1) based on a discounted price;<br/> 2) based on the estimated cost.</p> <p>Priority is given to the time factor, which plays an important role in investment decision-making. In this case, the investment project is reflected from the beginning as a model in the following form:<br/> <math>IP = \{IS, SF1, SF2, \dots, SFk, n, r\}</math>,<br/> IC - outflow of investment (expenditure of funds);<br/> SFk is the income in the k-base period (usually cash inflows);<br/> n is the number of base periods for which the project is implemented;<br/> r is the discount rate at which the cash flow elements are adjusted over a period of time.</p> <p>According to the author, the methodological tools for evaluating investment projects are net present value, net present value, investment return index, internal rate of return on investment, payback period of investments, etc. is calculated.</p>                                                                                                                                                                                                                                                                                                                                                                  |
| 3. Endovitskiy D.A. [8]                                                      | <p>According to the authors, a wide range of methodological tools for evaluating investment projects can be used in accordance with the following basic rules:</p> <ul style="list-style-type: none"> <li>- if the NPV (net present value of project cash flows) is positive, the project can be financed, otherwise it should be rejected;</li> <li>- selection of the project with the highest NPV, if there are alternative projects;</li> <li>- if it is required to form an investment portfolio from existing capital investments, it is necessary to create a combination of projects with high NPV.</li> </ul> <p>The basic formula for determining the net present value of projected cash flows is defined as follows:<br/> <math>NPV = \sum_{t=1}^n \frac{Sft}{(1+r)^t} - I_0</math>, ёки <math>NPV = PV - I_0</math></p> <p>Here, PV is the current value of the project cash flows;<br/> I0 - initial investment costs;<br/> n - the period for which the investment project is planned to be implemented;<br/> SF1 is the net cash flow for period t;<br/> r is the project discount rate.</p> <p>Using the basic formula of NPV, the authors will be able to determine the efficiency of long-term investments, the current value of projected cash flows, and so on.</p> |
| 4. Dmitrieva I.N.,<br>Myznikova<br>T.N.,Chernenko A.F.,<br>Shishkina A.V.[9] | <p>According to scientists, the effectiveness of financial leasing operations should be determined on the basis of the methodology of management analysis, based on the indicators adjusted in accordance with the requirements of international accounting standards. At the heart of this methodology, put forward by the authors, is the idea of comparing the potential costs incurred in the application of this or that type of debt relationship (through credit or leasing) for the lessee. Which of the mechanics of the potential costs to a minimum, the same mechanism is used.</p> <p>The methodology of management analysis proposed by the authors allows to choose a reasonable source of financing and optimize operating costs in order to modernize the means of production in enterprises.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

It should be noted that the quantitative and qualitative assessment of the effectiveness of leasing financing of investment projects is the basis of all methods. Qualitative assessment of leasing is to determine the comparison of the growth of absolute and relative indicators of production efficiency. In this case, it is considered cost-effective if the lease leads to an increase in production, labor organization, and fund returns.

In practice, it is important for the lessee to quantify the quantitative efficiency of the lease by comparing the amount of net cash flows of the lessee over the two options for sustainable development (at its own expense or on the basis of the lease).

Therefore, the following inequality should be used to determine the effectiveness of leasing (below formula 1):

$$IRR_n > P_{np},$$

(1)

In which:  $IRR_n$  is the expected level of internal return on leased asset assets;  
 $P_{np}$  is expected return on assets (without leasing) of an enterprise.  
In international practice, the following principles are widely used to determine the cost-effectiveness of leasing:

- the principle of separation of income and expenses;
- the principle of alternative assessment. NPV (net present value) and  $r$  (discount rate per unit time) and IRR (expected internal rate of return on leased assets) play an important role in this.

If  $NPV = 0$ , it is called the expected internal rate of return (IRR) of the asset. The IRR indicator represents the percentage of investment that can be achieved in a project. The project is effective when  $NPV > 0$ ,  $IRR > r$ , but ineffective when  $NPV < 0$ ,  $IRR < r$  [10].

- the principle of diversity of results and costs.

2 Research methodology

In this article, we consider the effectiveness of leasing services from the point of view of each entity involved in the leasing operation.

For the lessee, the assessment of the effectiveness of the leasing project in relation to the loan is made by comparing the cash flow elements for the two types of financial services (Table 2). The focus should be on the total cash flows and total costs associated with the project during the reporting period.

**Table 2.** The structure of the lessee's cash flows as a result of the leasing activity

| Elements of cash flows                                    |                    |                                                                  |                    |
|-----------------------------------------------------------|--------------------|------------------------------------------------------------------|--------------------|
| Cash inflow (+)                                           |                    | Cash outflow (-)                                                 |                    |
| Naming                                                    | Conditional symbol | Naming                                                           | Conditional symbol |
| Proceeds from the sale of a product using leased property | $S_{RT}$           | Cost of goods sold using leased property                         | $S_{MT}$           |
| Tax credit for accelerated depreciation (on income tax)   | $S_{FS}$           | Other operating expenses include lease payments. (Including VAT) | $S_{LT}$           |
| Reimbursement of VAT paid as part of lease payments       | $S_{VAT}$          | Income tax paid on the sale of a product using leased property.  | $S_{RFS}$          |
| Property tax savings.                                     | $S_{KMM}$          |                                                                  |                    |

The cash flows presented in this table are widely used under a lease scheme designed to be accounted for in the lessor’s balance sheet before the lessee acquires the leased asset. Analyzing the composition of cash flows, the following conclusions can be drawn:

1. As leasing activity is the main activity (current, operating), cash inflows and outflows from investing and financing activities are not observed in the structure of cash flows.
2. Lease payments as part of the costs of production and sales are accounted for as other operating expenses.
3. As an additional cash flow, we can cite the amount of VAT paid as part of the lease payments, saving on income tax.

Property tax is paid by the lessor as a local tax, taking into account the lessor's balance sheet of the leased object.

Based on the above considerations, the total (generalized) effect of the lessee is presented as follows:

$$S_{JS}=i_{FS}*S_{LT}$$

(2)

Here:  
 $i_{FS}$  - income tax rate;  
 $S_{LT}$  is the amount of lease payments.

$$S_{vat}=\sum_{i=1}^m C(VAT)i, m=kT$$

(3)

Here:  
 $S(VAT)$  - the amount of VAT in the i-payment;  
 $m$  is the number of accounting periods during the lease agreement;  
 $T$  - term of the lease agreement;  
 $k$  - the number of periods to be calculated in a year.

$$S_{KMM}=i_{SS}*S_{MK},$$

(4)

Here:  
 $i_{SS}$  - property tax rate,  
 $S_{MK}$  - the value of the property received under the lease agreement.

In the general case, total cash flows from leasing activities are defined as cash inflows and outflows as follows:

$$S_{PO}=(S_{RT}+S_{FS}+S_{vat}+S_{KMM})-(S_{MT}+S_{LT}+S_{RFS})$$

(5)

Analysis of the structure of cash flows arising in the lessee under the lease agreement allows him to create a methodology for comparing the effectiveness of leasing and credit relations. This technique:

- Analysis of property flows arising from the use of property acquired on the basis of leasing or borrowing;
- Includes the development of an evaluation sequence for each element of the cash flow.

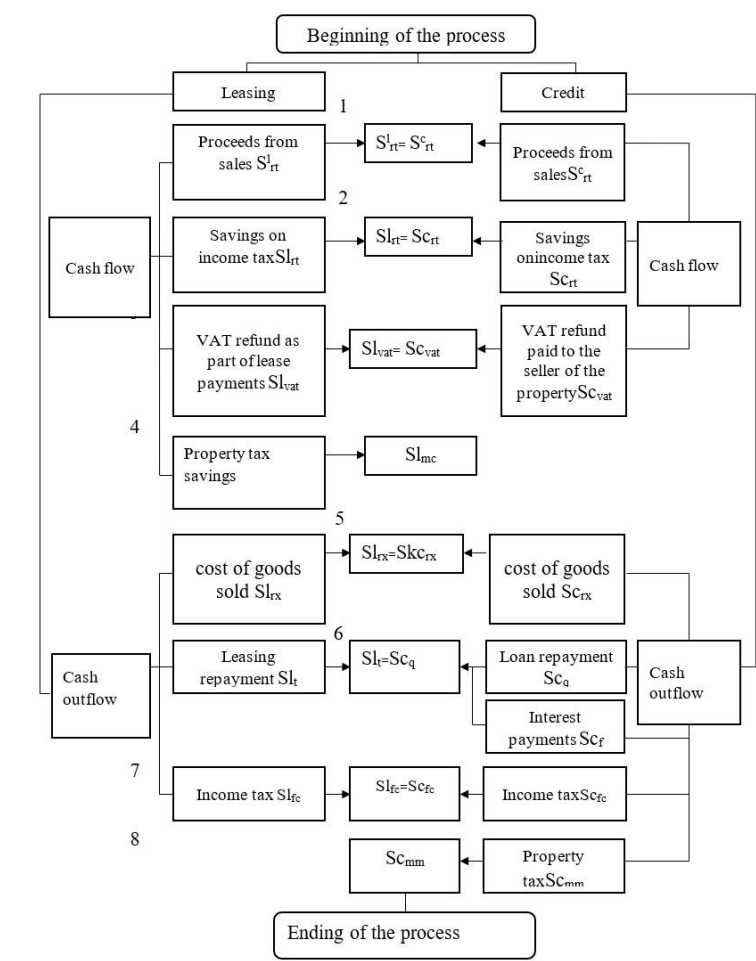
The cash flows that arise when a property is leased or borrowed are shown in the table below (Table 3).

**Table 3.** Cash flows that arise when a property is leased or borrowed

| The direction of the movement of funds | Methods of financing the acquisition of property                               |                    |                                                                                                            |                    |
|----------------------------------------|--------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------|--------------------|
|                                        | Leasing                                                                        |                    | Credit                                                                                                     |                    |
|                                        | Naming the cash flow item                                                      | Conditional symbol | Naming the cash flow item                                                                                  | Conditional symbol |
| Income (+)                             | Proceeds from the sale of products (works, services) using the leased property | $Sl_{rt}$          | Proceeds from the sale of goods (works, services) using the property received in return for borrowed funds | $Sc_{rt}$          |
|                                        | Tax credit for accelerated depreciation (on income tax)                        | $Cl_{fs}$          | Tax credit for accelerated depreciation(on income tax)                                                     | $Sc_{fs}$          |
|                                        | Covered amounts of VAT paid as part of lease payments. ( $C_{vat2}$ )          | $Cl_{vat}$         | VAT savings on the purchase of a leased object                                                             | $Sc_{vat}$         |
|                                        | Property tax savings                                                           | $Cl_{ms}$          |                                                                                                            |                    |

|              |                                                                |            |                                                                                                 |            |
|--------------|----------------------------------------------------------------|------------|-------------------------------------------------------------------------------------------------|------------|
| Expenses (-) | Cost of goods sold using leased property                       | $Cl_{rx}$  | Debt funds from the sale of the property using the cost of the products                         | $Sc_{rx}$  |
|              | Other operating expenses include lease payments                | $Cl_l$     | Income tax paid on the sale of products using property acquired in exchange for borrowed funds. | $Sc_{rfs}$ |
|              | Income tax paid on the sale of a product using leased property | $Cl_{rfs}$ | Loan repayment                                                                                  | $Sc_a$     |
|              |                                                                |            | Interest payments                                                                               | $Sc_f$     |
|              |                                                                |            | Property tax                                                                                    | $Sc_{mm}$  |

Below is a sequence of evaluations for each element of cash flow to compare leasing or credit efficiency (Fig.1.):

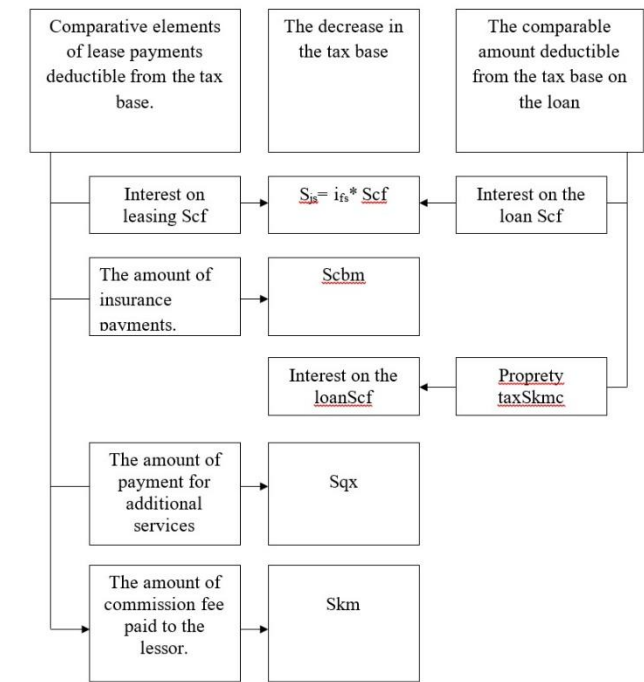


**Fig. 1.** Leasing and credit the borrower's cash flow to compare the sequence

Based on this picture, the following conclusions can be drawn:

- Revenues from the sale of goods (works, services) do not depend on the method of financing the property ( $SI_{rx}=Sc_{rx}$ ), so the details of the analysis may not include this element of cash flow;
- There is an accelerated depreciation tax credit (for income tax) on both leasing and credit. However, this figure needs to be analyzed in depth, as the amount to be reduced under the benefit varies;
- Leasing payments include not only the value of the property, but also other payments, such as VAT on lease payments, resulting in the owner being paid a higher amount of VAT than when buying property on credit ( $SI_{vat}>Sc_{vat}$ );
- The leased asset is on the lessor's balance sheet until it is purchased by the lessee. In this case, the lessee does not pay property taxes (which is not the case with credit);
- The cost of goods (works, services) sold using the leased property does not differ from the cost of goods (works, services) sold using the property acquired in exchange for borrowed funds ( $SI_{rx}= Sc_{rx}$ ). This means that these indicators can be excluded in the analysis of cash outflows;
- Lease payments are taken into account as the value of the property in the lease, and the loan takes into account the amount of principal and interest paid. ( $Sc_q + Sc_f$ ). These elements of cash flow also need to be analyzed in depth;
- Profit tax on the sale of products does not depend on the sources of financing the purchased equipment from which the product is manufactured ( $SI_{rfs}= Sc_{rfs}$ );
- Property tax is paid by the debtor, not by the lessee ( $Sc_{mm}$ ).

Given that in both financing options, the amount of depreciation is deductible from the taxable base, we only need to analyze the elements shown in the figure below to assess efficiency (Fig.2.).



**Fig. 2.** The composition of the elements deductible from the taxable base in determining the income tax on cash inflows by leasing and credit methods

In general, analyzing the cash flows of the borrower and the lessee in a credit relationship, we can give the following:

- In leasing there is an additional income due to the savings of property tax, and in the loan this element is an additional expense;
- Cash inflows through VAT are more common in leasing than in credit;
- For an in-depth analysis of the effectiveness of leasing and credit, it is expedient to compare the indicators of income tax savings (cash flow), lease payments, loan amount and interest payments (cash flow);
- Taxable profit on leasing is reduced by the amount of lease payments (excluding VAT), and on the loan is reduced by the amount of depreciation, property tax and interest on the loan.

It is necessary to compare the amount of lease payments (Slt) and loan repayment (Sqq) and the amount of interest on it (Skf) in terms of cash outflows. (Figure 3, band 6).

If the mandatory element of the lease payment is the commission premium (Sk<sub>m</sub>), the remaining set of elements is determined on the basis of the lease agreement. Table 4 below shows the conditions for the effectiveness of leasing in relation to cash loans when the composition of lease payments varies.

In the last three options listed in the table, interest payments on a loan do not depend on whether the loan was received by the lessee or another borrower. This credit is estimated to be lower compared with the efficiency of options.

**Table 4.** Conditions for the effectiveness of leasing in terms of cash inflows when the composition of lease payments varies

| № variation | Comparative elements included in lease payments                                                                                       | Terms of leasing efficiency in relation to credit |                                            |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------|
|             |                                                                                                                                       | On cash inflows                                   | On the expenditure of funds                |
| 1           | Commission bonus + profit tax                                                                                                         | $Sk_m > (Sk_f + Sk_f)$                            | $Sk_m + Sv_{at} < Sk_f$                    |
| 2           | The amount of commission premium + insurance premium                                                                                  | $(Sk_m + Ss_{bm}) > (Sk_f + Sk_f)$                | $Sk_m + Sv_{at} + Ss_{bm} < Sk_f$          |
| 3           | Commission premium + sum of insurance premium + cost of additional services                                                           | $(Sk_m + Ss_{bm} + S_{qx}) > (Sk_f + Sk_f)$       | $Sk_m + Sv_{at} + Ss_{bm} + S_{qx} < Sk_f$ |
| 4           | Commission fee + interest on the loan taken by the lessee                                                                             | $Sk_m > Sk_f$                                     | Terms do not exist                         |
| 5           | Commission premium + interest on the loan received by the lessee + the amount of insurance premiums                                   | $(Sk_m + Ss_{bm}) > Sk_f$                         | Terms do not exist                         |
| 6           | Commission premium + interest on the loan received by the lessee + the amount of insurance premiums + the cost of additional services | $(Sk_m + Ss_{bm} + S_{qx}) > Sk_f$                | Terms do not exist                         |

When evaluating an alternative lease agreement for the lessee, it is required to select indicators that reflect the characteristics of the lease, determine their scope, preparation of the initial database and the content of the evaluation indicators.

When evaluating leasing decisions, it is first necessary to consider two types of cash flows received as a result of using the leased asset, namely the lease payments (LT1, LT2, ..., LT<sub>m</sub>) and the amount of profit (FM1, FM2, ..., FM<sub>m</sub>).

In international practice, the following indicators are used to assess the effectiveness of investments:



- net present value;
- level of internal profitability;
- return on investment;
- payback period of investments.

The determination of these indicators is based on the discounting of cash flows, in other words the value of the amount of indicators at the beginning of a particular period. In assessing the effectiveness of leasing projects, let's focus on the content of these indicators and the methodology for determining them.

The following equation is required to determine the internal rate of return of a leasing project:

$$\sum_{n=1}^m \left( \frac{Fm_i}{(1+r)^n} \right) = \sum_{n=1}^m \left( \frac{LT_i}{(1+r)^n} \right) \quad (6)$$

Here:

LT<sub>i</sub> - the amount of lease payments in the office;

Fm<sub>i</sub> is the amount of net profit for the period i;

m is the number of cycles (m = kT);

$\sum_{n=1}^m \left( \frac{Fm_i}{(1+r)^n} \right)$  - the total amount of net profit determined during the lease term, in other words at the beginning of the period, taking into account the time factor;

$\sum_{n=1}^m \left( \frac{LT_i}{(1+r)^n} \right)$  - the total amount of lease payments determined during the lease term, in other words at the beginning of the period.

The level of internal profitability is the amount of net profit corresponding to the lease payment of 1 soum for each period of the lease agreement based on the use of the leased object.

The scope of application of the internal rate of return is very wide, especially in the implementation of large-scale leasing projects of strategic importance, long-term and high-yield, it is advisable to use this indicator. Based on the level of internal profitability of the lessee, the leasing project can be selected based on the assumption of profitability of the required leasing decisions.

The next indicator is the net present value of the leasing project, which can be determined by the following formula:

$$NPV = \sum_{n=1}^m \left( \frac{Fm_i}{(1+rn)^n} \right) - \sum_{n=1}^m \left( \frac{LT_i}{(1+rn)^n} \right) > 0 \quad (7)$$

Here:

rn - discount rate (used by reliable commercial banks at the level of interest rates or as an efficiency of alternative investment projects).

Net present value means how much the amount of income provided during the lease period exceeds the lease payments, and its application is not limited by the size of the project, its duration and project characteristics. It should be noted that in international practice, the net present value indicator is widely used mainly by medium-sized businesses, and to a limited extent by large and small businesses in the evaluation of projects.

The profitability of a leasing project can be determined by the following formula:

$$R_{\pi} = \frac{\sum_{n=1}^m \left( \frac{Fm_i}{(1+rn)^n} \right)}{\sum_{n=1}^m \left( \frac{LT_i}{(1+rn)^n} \right)} - 1 > 0 \quad (8)$$

This indicator represents the amount of net current profit obtained as a result of the use of the leased object, corresponding to the unit of discounted lease payments at the beginning of the lease project implementation period. If this indicator is positive, the lessee will cover the lease payments from the profit earned during the term of the lease agreement and will have a net discounted income of Rl from the discounted lease payments.

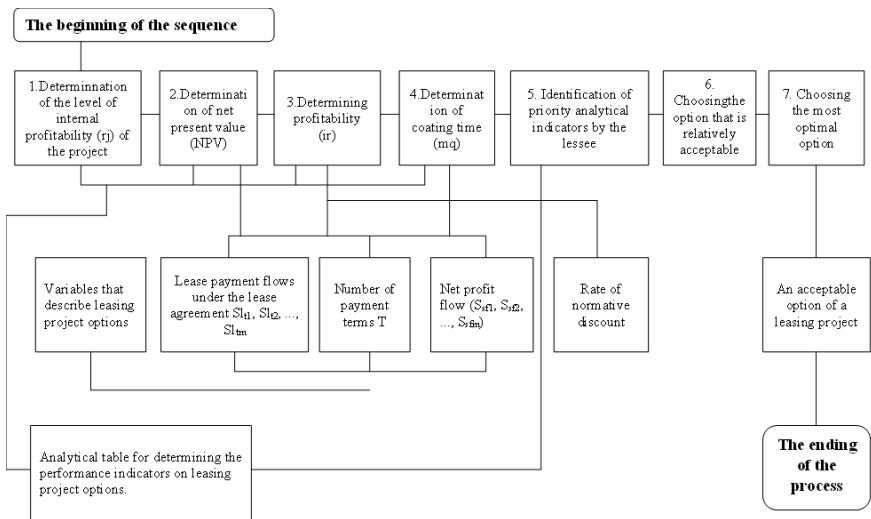
When choosing a leasing project, a highly profitable option should be preferred. It is advisable to use the rate of return together with the net present value in the evaluation of leasing projects among medium-sized businesses.

One of the most important indicators used in evaluating the effectiveness of a leasing project is the payback period of the lease payments. This indicator plays an important role in the activities of small businesses, which do not have large capital and try to immediately repay the money that should be paid to the lessor. If we take the repayment period as  $m_q$ , then the total amount of the lease payment period from the beginning of the lease period is determined by the following formula. In this case, the sum of lease payments is equal to the net present value obtained as a result of the use of the leased object during this period:

$$\sum_{n=1}^{m_q} \left( \frac{F M_i}{(1+r)^n} \right) = \sum_{n=1}^{m_q} \left( \frac{L T_i}{(1+r)^n} \right) \tag{9}$$

The shorter the repayment period, the faster the lessee recovers the funds invested in the lease.

We try to reflect in a certain sequence the methodology of selecting the most optimal option from the leasing projects (Fig.3.)



**Fig. 3.** Thesequence of selection of the most optimal leasing project by the lessee

The level of potential of leased equipment is also affected by the indicators that reflect the financial stability of the lessee. The main parameters that characterize the financial stability should include indicators that reflect the ability of the lessee to increase the income of the enterprise.

In the context of market relations, the category of income is one of the most important economic categories. An enterprise operating on the basis of leasing performs a number of

functions in the process of formation and use of income (profit). The efficiency of the lessee's business can be determined by its level of profitability.

The income of the enterprise depends on two indicators, namely the value (price) of the leased object and the amount of costs for its introduction into production. The market value of the leased equipment arises as a result of the supply and demand relationship. In free competition, the formation of the value (price) of leasing equipment is regulated automatically by market laws, not at the discretion of the manufacturer or buyer.

Profit from leased equipment describes the economic effect obtained as a result of the enterprise's activities. It is accumulated through production, financial activities, services and other economic processes, and is spent on production, personnel, savings and other areas. The profitability of an enterprise operating on the basis of a lease means that the income related to its activities exceeds the costs, and it also performs incentive functions. This is explained by the fact that profit is both a financial result and a key element of the financial resources of the enterprise using the lease, and revenues serve as the main source for the formation of different levels of budget.

One of the factors in the economic activity of a leasing company is its financial resources. Financial resources are also seen as the main sources and resources of production (service) activities from an economic point of view. The growth of financial resources will help to increase the net profit and profitability of the leasing company.

The amount of profit from the sale of goods (services) in enterprises operating on the basis of leasing depends on internal and external factors. Internal factors include the modernization of the enterprise through the introduction of all equipment and technologies on a leasing basis, the organization of operations in a modern way, ensuring the competitiveness of products, changes in production costs, development of product types and structure and labor organization. External factors that do not depend on the activities of the leasing company include market conditions, the cost of consumed and leased material and technical resources, depreciation rates, tax system, etc.

The profits of enterprises operating on the basis of leasing are divided into several types according to the accounting data: net profit, balance sheet profit, economic profit, etc. This is a practical aspect of the issue. Theoretically, it can be of two types: income and net profit.

In determining the production efficiency of the enterprise on the basis of leased equipment and technical means, its net profit is obtained. It is also possible to determine the financial performance of the enterprise through the net profit.

Through econometric analysis, it is possible to study the production potential of leasing companies, the degree of their impact on production. We see this in the example of a lease agreement with Uzagroleasing JSC (Table 5).

**Table 5.** Production potential of "A" LLC, which leased equipment and technical means on the basis of a lease agreement with JSC "Uzagroleasing", their impact on net profit

| № | Years | $x_1^{(i)}$ – the production volume at current prices (billion soums) | $x_2^{(i)}$ – the goods containingoil (tons) | $x_3^{(i)}$ – the dairy production capacity (tons) | $x_4^{(i)}$ – production capacity of other products (tons) | Net profit of a leasing company |
|---|-------|-----------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------|------------------------------------------------------------|---------------------------------|
| 1 | 2016  | 1,86                                                                  | 11,04                                        | 1,23                                               | 1,61                                                       | 4,27                            |
| 2 | 2017  | 2,01                                                                  | 11,63                                        | 1,01                                               | 1,72                                                       | 4,29                            |
| 3 | 2018  | 2,69                                                                  | 11,91                                        | 2,03                                               | 1,64                                                       | 1,65                            |
| 4 | 2019  | 3,03                                                                  | 12,26                                        | 2,46                                               | 1,83                                                       | 8,64                            |

\* Prepared by the author on the basis of economic indicators of "A" LLC.  
Based on the data in Table 1, the following definitions can be seen below:

$x_1^{(i)}$  - volume of production at current prices,  $x_2^{(i)}$  - production of fat products,  $x_3^{(i)}$  - volume of production of dairy products,  $x_4^{(i)}$  - volume of production of other products,  $Y$  - enterprise operating on a leasing basis get a net benefit. We present these figures in the form of a mathematical module:

$$Y = a_0 + a_1 \ln x_1^{(i)} + a_2 \ln x_2^{(i)} + a_3 \ln x_3^{(i)} + a_4 \ln x_4^{(i)} \quad (10)$$

We look for this formula in the first formula view. In this case, the smallest squares of the mathematical model are determined based on the method, the values of the parameters  $a_0, a_1, a_2, a_3, a_4$  are determined as a result

$$\varphi(a_0, a_1, a_2, a_3, a_4) = \sum_{i=1}^n \left( Y_i (a_0 + a_1 \ln x_1^{(i)} + a_2 \ln x_2^{(i)} + a_3 \ln x_3^{(i)} + a_4 \ln x_4^{(i)}) \right)$$

the function reaches the smallest value. The solution of this problem serves to find the solutions of the following system of equations:

$$\begin{cases} \frac{\partial \varphi(a_0, a_1, a_2, a_3, a_4)}{\partial a_0} \\ \frac{\partial \varphi(a_0, a_1, a_2, a_3, a_4)}{\partial a_1} \end{cases} \quad (11)$$

Here are the specific derivatives by parameters of this function  $\frac{\partial \varphi(a_0, a_1, a_2, a_3, a_4)}{\partial a_1}$

The system of equations (11) We make the following system of equations by making substitutions in the prescribed order:

$$\begin{cases} a_0 n + a_1 \sum_{i=1}^n \ln x_1^{(i)} + a_2 \sum_{i=1}^n \ln x_2^{(i)} + a_3 \sum_{i=1}^n \ln x_3^{(i)} + a_4 \sum_{i=1}^n \ln x_4^{(i)} = \sum_{i=1}^n Y_i \\ a_0 \sum_{i=1}^n \ln x_1^{(i)} + a_1 \left( \sum_{i=1}^n \ln x_1^{(i)} \right)^2 + a_2 \sum_{i=1}^n \ln x_2^{(i)} \ln x_1^{(i)} + a_3 \sum_{i=1}^n \ln x_3^{(i)} \ln x_1^{(i)} + a_4 \sum_{i=1}^n \ln x_4^{(i)} \ln x_1^{(i)} = \sum_{i=1}^n Y_i \ln x_1^{(i)} \\ a_0 \sum_{i=1}^n \ln x_2^{(i)} + a_1 \sum_{i=1}^n \ln x_1^{(i)} \ln x_2^{(i)} + a_1 \left( \sum_{i=1}^n \ln x_2^{(i)} \right)^2 + a_3 \sum_{i=1}^n \ln x_3^{(i)} \ln x_2^{(i)} + a_4 \sum_{i=1}^n \ln x_4^{(i)} \ln x_2^{(i)} = \sum_{i=1}^n Y_i \ln x_2^{(i)} \\ a_0 \sum_{i=1}^n \ln x_3^{(i)} + a_1 \sum_{i=1}^n \ln x_1^{(i)} \ln x_3^{(i)} + a_2 \sum_{i=1}^n \ln x_2^{(i)} \ln x_3^{(i)} + a_3 \left( \sum_{i=1}^n \ln x_3^{(i)} \right)^2 + a_4 \sum_{i=1}^n \ln x_4^{(i)} \ln x_3^{(i)} = \sum_{i=1}^n Y_i \ln x_3^{(i)} \\ a_0 \sum_{i=1}^n \ln x_4^{(i)} + a_1 \sum_{i=1}^n \ln x_1^{(i)} \ln x_4^{(i)} + a_2 \sum_{i=1}^n \ln x_2^{(i)} \ln x_4^{(i)} + a_3 \sum_{i=1}^n \ln x_3^{(i)} \ln x_4^{(i)} + a_4 \left( \sum_{i=1}^n \ln x_4^{(i)} \right)^2 = \sum_{i=1}^n Y_i \ln x_4^{(i)} \end{cases} \quad (12)$$

If the parameters  $a_0, a_1, a_2, a_3, a_4$  are determined from the above system of equations and put it in formula (1), a definite relation for the function  $Y$  is formed.

We create economic factors affecting the net profit of "A" LLC and methods of their assessment. By calculating the coefficients of the system of normal equations of the form (3), and then finding the solution of the system of equations, the net profit of LLC "A" operating on a leasing basis can be calculated on the basis of the following formula:

$$Y = 58,4 \ln x_1 + 47,6 \ln x_2 + 11,11 \ln x_3 - 19,135 \ln x_4 - 242,253 \quad (13)$$

can be calculated with above mentioned formula.

The mathematical models analyzed are significant with a probability of 0.95 according to the Fisher criterion.

According to the model, the current volume of production in favor of the net profit of LLC "A" has a significant impact on the production of fat products, dairy products. This, in turn, requires the comprehensive development of these areas.

The above table data can be analyzed in different directions. In terms of practical results, it can be noted that the growth of net profit of LLC "A" can also solve the problem of forecasting them over the years. If the net profit of LLC "A" is studied in terms of years, in other words  $x$ -years,  $Y$ - "A" LLC represents the net profit, using the method of least squares, the appearance of the mathematical model

if it is seen as function  $Y = a + b(x - 2016)$

$$Y=30,375+16,975t(13)$$

Here the formula  $t = x - 2016$  is formed. When the coefficients of  $t = 8, \dots, 12$  are checked using the Fisher criterion, the coefficients become significant because the actual value is greater than the value in Table 1.

Thus, as a result of econometric analysis of factors that significantly affect the net profit of LLC "A" and its development, in other words leased equipment and technical means, it is important to use this system in the development of effective production activities of LLC based on leased equipment and technical means.

### 3 Conclusion

Based on the research conducted to assess the cost-effectiveness of leasing services, as well as a comprehensive system for assessing the methodological aspects of leasing financial resources for the modernization of the industry, the following conclusions were drawn:

1) Given the diversity of project financing, it is important to avoid confusion and subjectivity in strategic decision-making.

2) This situation is directly reflected in the objective assessment of the effectiveness of leasing services through various methods. Methods of assessing the effectiveness of leasing should be based on the laws of modern economic doctrines and all the factors and indicators associated with the implementation of leasing services. Methods of objective assessment of the effectiveness of leasing services require the use of objective criteria, time factors in the calculations, the use of correction factors reflecting the specifics of the lease, the prospects of the international leasing market and the interests of all participants in the lease agreement.

3) In leasing financing of investment projects, it is important to compare the effectiveness of leasing with the methods of calculating lease payments. To compare these methods, it is first necessary to compare the amount of lease payments by period. The fact that the amount of lease payments has a direct impact on the financial and economic condition of the enterprise shows how important this criterion is. Also, the wrong choice of methods by the enterprise leads to a decrease in its solvency. This creates a negative situation for both parties to the lease agreement.

4) In order to ensure the objectivity and transparency of leasing services, in assessing its cost-effectiveness, special attention should be paid to the complexity of the program developed to update the fixed assets of business entities and accelerate the process of their technical re-equipment. This requires a separate analysis of each project for the financing of fixed assets. This is the reason why businesses do not make mistakes in the development of long-term strategies for innovative development.

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