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METHODICAL AND PRACTICAL ASPECTS OF CREDIT SUPPORT FOR FIXED ASSETS RENEWAL OF INDUSTRIAL ENTERPRISES

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Purpose. In market conditions of business, the competitiveness of enterprises is largely determined by the condition of their fixed assets. The need to replace outdated technologies and equipment with modern ones requires the availability of appropriate financial resources. Inadequacy of own internal sources of investment for the renewal of fixed assets encourages enterprises to widely use external, in particular, credit. At present, in the economic theory and practice of management, there is no clearly developed mechanism for investing in the renewal of fixed assets with the involvement of credit resources. Inadequate development of such issues as the choice of a profitable loan option, the optimal loan rate, the terms and conditions of loan repayment, calls for the development of methodical and practical approaches to effective investment in the renewal of the fixed assets of enterprises.

Design/methodology/approach. The article uses the discounting method and the balance sheet method for calculating and analyzing the parameters of the process of attracting credit resources. The method of economic-mathematical modeling was used to study the influence of the use of borrowed funds in investing in the renewal of fixed assets on the pace of development of production potential.

Findings. The article considers a number of problems of a methodological and practical nature regarding investment support for the renewal of fixed assets of enterprises, in particular with the involvement of credit resources. The parameters of the loan attraction process, which determine its effectiveness for the enterprise, are analyzed. The most important of these parameters include: the term of the loan; interest rate for the loan; loan payment amounts. To determine the size of the payment for the loan, the appropriate ratio based on the use of compound interest was considered. Derived dependencies for calculating the annual payment for the loan, the annual payment from one monetary unit of the loan, as well as the total amount of funds that must be paid for the entire period of the loan. The values of these parameters are calculated depending on the value of the credit rate and the credit term, which makes it possible to quantitatively assess their trends. The results of the calculations are presented in tabular form.

The impact of attracting credit funds in investments for the renewal of fixed assets was studied by modeling this process. An approach to determining the marginal interest rate at which it is still profitable for the enterprise to attract loan funds is proposed. For this purpose, appropriate computer

calculations were carried out. Calculations were carried out for the option of fixed assets renewal with own funds, as well as with the involvement of a loan at various interest rates. An important conclusion was made that the dynamics of production development depends on the relationship between the interest rate and the growth rate of capital investments in the basic version, when production development is carried out only at the expense of own investment funds.

Practical implications. The methodical and practical results obtained in the research process can be used in the selection of credit support options for the renewal of fixed assets and the development of specific measures aimed at improving the investment activity of industrial enterprises.

Originality/value. The article quantitatively evaluates the parameters of credit support for the fixed assets renewal of enterprises. By means of economic-mathematical modeling, the impact of attracting loan funds on the dynamics of changes in the production potential of the enterprise was analyzed.

Key words: credit funds; renewal of fixed assets; investment; production potential; credit rate, credit term, growth rate.

Problem statement

In the current conditions of the modern economy dynamic development, number of issues such as the technical level of production, quality and competitiveness of products, that largely depend on the state of the fixed assets of enterprises. The economic development of the country dictates the requirements to replace outdated technologies and capital assets with modern ones. Thus, the investment support for the renewal of fixed assets becomes one of the main factors of the enterprises' successful functioning, along with the correct market strategy and management. However, many managers of enterprises, realizing the need for timely and effective renewal of fixed assets are facing the problem of insufficient financial resources to ensure this process. Therefore, along with their own sources of investment in renewal, enterprises widely use external sources, such as the sale of securities, leasing and credit.

It should be noted that, despite the number of existing works on this topic in the economic literature, there is no clearly developed investment mechanism for the process of fixed assets renewal, which would be adapted to market conditions. This, together with the insufficient amount of financial resources, does not allow for effective and timely renewal of outdated equipment, leads to the unprofitable capital investments, debts, etc. For the time being, the insufficiently developed issues include the procedure for forming volume targets of financial resources of enterprises for the needs of updating fixed assets, the choice of favourable terms for attracting loans, i.e. the interest rate, the term of taking a loan, the terms of payment of both the principal amount of the loan and interest. At the same time, an important component of the enterprise's investment strategy is the monitoring of the initial state of the enterprise and the dynamics of the main material and financial flows during the renewal interval, and the influence of credit funds on it. The relevance of these issues requires the development of new methodological and practical approaches to effective investment strategy. In order to assure innovative development of an enterprise and its competitive position in current market conditions, the questions of the renewal of the main production facilities should be developed.

Analysis of recent research and publications

The number of works of domestic and foreign specialists is dedicated to the study of the processes of the enterprise's credit provision activity in the contemporary scientific literature, in particular, this problem was studied by I. A. Blank [1], A. M. Podderyogin [2], V. I. Mishchenko [3], S. V. Mocherny, D. F. Krysanov, N. G. Slovianska, S. F. Pokropivnyi [4], U. V. Vladychyn [5], V. M. Trehobchuk, O. H. Agres [6] etc. The works of these scientists present the theoretical aspects and the essence of lending [1–4; 7; 8], and highlight the features of credit provision for the reproduction of fixed assets [9–12]. A number of scientists studied the possibilities of credit stimulation of economic development [13; 14], studied the issue of lending enterprises by banks, etc. [5; 13; 15].

At the same time, taking into account the need in modern conditions to increase the competitiveness of enterprises and to quickly renew their fixed capital, a number of practical and methodical problems arise related to the mechanism and tools by which this renewal takes place, as well as its resource provision, remain insufficiently developed. It is also necessary to take into account the specific situations that have developed at enterprises and their financial capabilities regarding the development of their own production potential.

Hypotheses formulation and presentation of goals

The main goal of the article is to study the methodological and practical aspects of attracting and using credit resources in the process of fixed assets renewal at enterprises. There are such aspects as the development of an approach to evaluate the profitability of different interest rates, monitoring the size of investments, applying the method of comparing the development of production potential in the version of own investment funds and with the additional involvement of borrowed funds. They aimed at helping the management of enterprises to choose the option of attracting credit resources to ensure the technical development of production.

Research methods

During the process of studying of fixed assets renewal regularities at enterprises with the involvement of credit resources, the following methods of scientific research were used: balance sheet method, systematization, economic and mathematical modelling, discounting method.

Presentation of the main material

In order to invest in the renewal of fixed assets during production process, the enterprises along with their own, widely attract loan resources. These resources include bank loans, commodity (commercial) credit and financial leasing. Before making a decision on attracting credit resources, the enterprise must calculate their effectiveness. In the condition, when investment project is ineffective, there will be still need to pay for the loan. Currently, loans for domestic enterprises are provided at high (compared to European countries) interest rates, and interest on loan payments is the main cost of this type of financing. Therefore, the size of the payment for the loan is the basis for calculations when justifying the feasibility of attracting credit resources. The speed and simplicity are the positive properties of borrowing, unlike, for example, the issue of securities. In addition, if the enterprise functions successfully and is creditworthy, then an increase in the share of external sources in its financial resources often increases the return on equity. Thus, in general, managers should be careful when making decisions about attracting credit resources. However, in the case of making important decisions and making capital investments that affect the strategic development of the enterprise, one should take reasonable risks, although it is quite difficult to quantitatively predict the consequences in the case of the loan investments costs.

The company's strategy for attracting credit funds should be based on certain principles. First, it is necessary to analyse the consequences of the use of borrowed funds during previous periods and determine the goals of their attraction in the next period (year). The task of analysing the attraction of credit resources during the previous period is to evaluate the effectiveness of their use, as well as to study its structure and volumes. When determining the purpose of attracting loan funds for the future period, it should be assumed that they should be attracted only for targeted projects, in particular for renewal of fixed assets, introducing innovations, etc. The next step should be the justification of the required volume of credit resources, their structure in relation to sources and proportions between short-term and long-term loans.

Regarding the determination of the maximum possible amount of credit resources, here it is necessary to observe the limits of financial leverage, the normative value of which should be within the range of 0.5–1, and also to ensure sufficient financial stability of the enterprise. Taking into account these conditions, the company can plan its credit borrowings and determine their maximum volume. Although in practice

there is a situation when the company seeks to gain leadership in the market and get the maximum profit from an innovation that is guaranteed to be in demand. In this case, it can take significant loans in a short period of time and violate the normative values of indicators of financial stability. This can be done under the condition that the amount of profit will be sufficient to ensure a high return on capital after paying off the loan.

When choosing the sources of financing, a preliminary assessment of the cost of attracting credit funds should be carried out. Such assessment is carried out by means of the appropriate methods based on available data. After that, a decision is made regarding the formation of the optimal structure of funding sources. It is also necessary to distribute investments over time depending on the purpose of capital investments. Here, an important condition is to use such sources of financing, where the payment for the loan could be secured from income from capital investments. Therefore, financing should be carried out at the expense of own funds and long-term loans by distributing investments over time and satisfy the need for cash, as well as their coverage. If this principle is not followed, it may be necessary to pay for capital investments long before the needed income has been received.

The economic situation of many domestic enterprises determines their limited opportunities in using their own funds, and the system of long-term crediting is currently underdeveloped. Therefore, in practice, the financing of capital investments at the expense of short-term loan resources is quite widely used. An important factor in the planning of capital investments is the comparison of the company's costs for investing with the planned profit from their implementation. At the same time, it is necessary to take into account the possibility of the tax policy and inflation fluctuations. It should be noted that the values of credit interest rates and profit from investments should be compared. It is in the interest of the enterprise to use possible benefits in the field of regional and state lending and financing, as well as the possibility of deferred payment for the loan.

The ratio between long-term and short-term borrowings is planned depending on the purpose of their use. As a rule, short-term (up to 1 year) financial resources are used to solve operational tasks, and long-term (with a term of more than 1 year) are used to ensure extended renewal of fixed assets.

Forms of lending are chosen depending on the purpose of the borrowed funds. At present, the main forms of attracting loan resources can be considered a bank loan and a commercial (commodity) loan.

Usually, the main creditors of the enterprise are its partners, with whom there are well-established industrial and economic relations and formed trust. It can be a bank that carries out operations to service the enterprise, or its permanent suppliers. When concluding a credit agreement, you should pay attention to such important conditions as the interest rate, the terms of payment of the principal amount of the loan (the body of the loan) and interest on the loan, the term of the loan, possible sanctions for late payments, the possibility of debt restructuring, etc. In the lending process, the interest rate is set by the bank taking into account its risks when granting the loan. After all, as is known, there has been a crisis of credit defaults for a long time in Ukraine. Therefore, banks seek to reduce the risk of non-repayment of the loan and, in this regard, pay attention to the solvency of the borrower company, the existence of justification for the purpose of lending in the form of a business plan, the possibility of collateral, the history of previous cooperation, etc.

In general, the determination and establishment of a rational credit rate is a rather complex economic problem. On the one hand, the bank wants to compensate for risks and get maximum profit from its services. At the same time, since the bank is interested in customers, it tries to offer interest and additional benefits acceptable by the borrower. The competition of domestic banks for clients can be considered a positive trend, which will contribute in the long term to the de monopolization of this area and the maintenance of credit rates at a more or less acceptable level. However, in comparison with highly developed countries, bank credit interest rates are currently much higher in Ukraine, which undoubtedly slows down the process of reproduction of the enterprises' fixed assets. N. S. Dotsenko in general considers inappropriate to use loan capital to update the main means of production due to its high cost [20]. However, in our opinion, this approach needs to be clarified in relation to each specific situation of obtaining a loan. In

practice, the interest rate is set on the basis of the average lending rate, that is being currently accepted in the country. It, in turn, depends on a number of macroeconomic indicators – the NBU (National Bank of Ukraine) discount rate, the state of the economy, the inflation rate, etc. The task of reducing interest rates for enterprises with the aim of providing cheap financial resources for their development is one of the first priorities. But decisions in this direction should be made gradually and be balanced, because this will lead to a decrease in deposit rates and consequently may cause an outflow of funds from the banking system. Nevertheless, at the current stage, the tendency to lower bank lending rates is necessary for the country's economic development. Regarding the enterprise, in order to successfully cooperate with the creditor, the terms of the credit agreement should be fulfilled, that is, the borrowed funds should be returned on time. In order to achieve it, the credit payments must be included in the company's payment calendar and regularly monitored [1,2]. As a criterion for evaluating the efficiency of the credit recourses' use, it is customary to use indicators of profitability and turnover of borrowed funds. However, in our opinion, this question is not sufficiently developed and requires further research.

The financing of current capital investments is carried out at the expense of the own accumulation fund and borrowed funds minus loan payments. This can be written using the following balance equation:

$$K\ t\ = K_o\ (t) + K_l\ \ t\ \ - K_c\ (t), \tag{1}$$

where $K\ t\ $ is capital investment in the renewal of fixed assets; $K_o\ (t)\ $ – own funds; $K_l\ \ t\ $ – loan funds; $K_c\ \ t\ $ – amount of loan payment.

Own investments in the renewal of fixed assets constitute an accumulation fund, which is formed at the expense of depreciation and part of the profit.

To determine the size of the loan payment, consider the appropriate ratio based on the use of compound interest. In this case, the following dependence occurs:

$$I = \frac{r_1}{1+i} + \frac{r_2}{(1+i)^2} + \cdots + \frac{r_\tau}{(1+i)^\tau}, \tag{2}$$

where I is credit investment (loan amount); i – credit rate (loan interest rate); τ – loan repayment term (loan duration); r_i – loan payment amount in the *i*-th period (year, month);

Under the condition of equal payment for the loan for individual years of the loan period, we have:

$$I = r\ \ \frac{1}{1+i} + \frac{1}{1+i\ ^2} + \cdots + \frac{1}{1+i\ ^\tau}\ . \tag{3}$$

We multiply the left and right parts of equation (3) by $1 + i\ ^\tau$, then we obtain:

$$1 + i\ ^\tau I = r\ \ 1 + \ \ 1 + i\ \ + \cdots + \ \ 1 + i\ ^{\tau-1}\ \ = r\ \ \ 1 + i\ ^\tau - 1\ \ / i. \tag{4}$$

From this follows the size of the annual payment for the loan (r) with a uniform annual payment:

$$r = \frac{(1+i)^\tau}{(1+i)^\tau - 1}\, i \times I \ \text{ or } \ r = AI, \ \text{where } \ A = \frac{(1+i)^\tau}{(1+i)^\tau - 1}\, i. \tag{5}$$

Parameter *A* represents the annual payment from one monetary unit of the loan.

For example, let's assume that the loan rate is 15 %, and the loan is taken for 3 years with equal payments. In this case, according to the calculation, 0.4380 UAH must be paid for each borrowed UAH in each of the three years.

If the loan term τ is long enough (τ→ ∞), then the annual payment will be the minimum amount equal to $r = i \times I$, i. e. it will be equal to the product of the loan rate by the loan size.

In general, the loan payment, in addition to the interest rate, also depends on the terms of the loan. The corresponding numerical calculations for the annual payment for the loan are presented below in Table 1.

Table 1

The value of parameter *A* depending on the credit rate (*i*) and credit term (τ)

τ	*A* with *i*						
	0.00	0.05	0.10	0.15	0.20	0.25	0.30

1	1.0000	1.0500	1.1000	1.1500	1.2000	1.2500	1.3000
2	0.5000	0.5378	0.5762	0.6151	0.6546	0.6944	0.7348
3	0.3300	0.3672	0.4021	0.4380	0.4747	0.5123	0.5506
4	0.2500	0.2820	0.3155	0.3503	0.3863	0.4234	0.4616
5	0.2000	0.2310	0.2638	0.2983	0.3344	0.3719	0.4106

Source: own calculations.

Note that when $i = 0$, the value of A is equal to $\frac{1}{\tau}$, because there is an approximate equality:

$$1 + i\ ^{\tau} \approx 1 + \tau i.$$

It follows from the tabular values that at the same value of the credit rate, with the growth of τ, the annual payment decreases.

It is advisable to calculate the total amount of funds that must be paid for the loan for the entire loan period. We denote the value of the total payment funds as parameter B. The corresponding calculations are presented in tabular data (Table 2).

Table 2

The value of parameter B depending on the credit rate (i) and credit term (τ)

τ	B with i						
	0.00	0.05	0.10	0.15	0.20	0.25	0.30
1	1.0000	1.0500	1.1000	1.1500	1.2000	1.2500	1.3000
2	1.0000	1.0756	1.1524	1.2302	1.3092	1.3888	1.4696
3	1.0000	1.1016	1.2063	1.3140	1.4241	1.5369	1.6518
4	1.0000	1.1280	1.2620	1.4012	1.5452	1.6936	1.8464
5	1.0000	1.1550	1.3190	1.4915	1.6720	1.8595	2.0530

Source: own calculations.

The analysis of tabular data shows, as obvious, that for higher credit rates and longer credit terms, the total expenses will be higher. The resulting numerical calculations make it possible to evaluate these trends quantitatively. So, with the help of the data in the Table, it is possible to determine the additional amount of money that should be paid in relation to the loan funds. For the previously taken example (the interest rate is 15 %, and the loan is taken for 3 years), the additional amount of funds according to tabular calculations will be 31.4 percent of the loan amount.

Let's consider the influence of attracting credit funds for investments in the renewal of fixed assets on the example of modeling this process. Modeling the technical development of a specific enterprise requires, first of all, taking into account its initial economic situation and the resource possibilities of changing it. Then there is the problem of choosing the trajectory of the transition to another state of economic development of the enterprise. We will consider the content of the renewal dynamics on the following example. We assume that the production system consists of a set of the same type equipment, which can be replaced by new equipment of higher productivity. At the initial moment of time, the cost of the main means of production, the number of employees, and the volume of production are known. The system forms an accumulation fund at the expense of profit, which is used to purchase new equipment. To simplify considerations, we believe that during the renewal process, the number of employees remains constant during the interval of complete renewal of the equipment. Having investment funds at the initial moment of time, we will purchase a certain amount of new equipment. Under the condition of a stable employees number the amount of equipment that is eliminated is clearly determined. Through balance calculations, there is also an increase in operating expenses and production volumes. So, in the adjacent period of time, the new economic state of the production system is known, which is characterized by similar initial indica-

tors – the new cost of fixed assets, the number of employees and the new production potential in terms of production volumes. With a given rate of accumulation, the process is modeled and analyzed over the entire interval of replacement of existing equipment with new ones. The considered process should be classified as multivariate. There are several controllable parameters here. They include, first of all, the rate of accumulation. By increasing or decreasing the accumulation, a different intensity of renewal is achieved, that is, the period of complete replacement increases or decreases. Accordingly, the dynamics of increasing production volumes and reaching their maximum value changes, which is determined by the capacity of new equipment, taking into account the given number of employees. The regulation of the update can take place within the limits that are related to the demand for products or other possibilities of their production. If the dynamics of production is specified, then with a constant number of employees, the amount of investment is determined unambiguously. Additional investments here can only be used to release workers.

Along with investments, labor resources are the second regulated parameter, which depends on the dynamics of the technical development of the production system. The increase in the release of workers, other things being equal, is associated with a more intensive renewal of fixed assets.

The possibility of using different new equipment for replacement, which, in particular, differs in cost and productivity, determines the significant variability of the technical development of production. This affects the resource provision of development, the formation of investments, the release of workers, the growth rate of fixed assets and production volumes.

The considered approach to the modeling of the FA renewal process is illustrated by the calculations given in Table 3. According to the source data at the beginning of the renewal, the production system included 10 units of the same type of equipment, each of which had a cost of 10.5 c. u. and a productivity of 6. A unit of new equipment is characterized by a cost of 45 c. u. and a productivity of 12. Investment funds for renewal are formed at the expense of 20 percent of production and depreciation deductions of 10 percent.

Table 3

Renewal of FA and development of production potential without involving credit funds

Indicators	Years of equipment replacement				
	1	2	3	…	10
Fixed assets, c. u.	105.00	122.25	141.23	…	342.555
Product, c. u.	60.00	63.00	66.32	…	101.310
Capital investments, c. u.	22.50	24.83	27.38	…	54.525
New equipment, c. u.	0.50	0.55	0.61	…	1.21
Increase in fixed assets, c. u.	00.00	17.25	18.98	…	41.80
Product growth, c. u.	00.00	3.00	3.32	…	7.27

Source: own calculations.

The analysis of tabular data shows that in the process of renewal of fixed assets at the beginning of replacement, the growth rates of fixed assets are 1.1643, the growth rates of production volumes are 1.05, and capital investments are 1.103. Thus, the growth rates of fixed assets are higher than the growth rates of production volumes, and the growth rates of capital investments are in the middle between these two growth rates.

At the end of the update period, the growth rates of production volumes are 1.689, which significantly exceed the growth rates of FA and capital investments –3,262 and 2,423, respectively. Thus, with this update option, the growth rates of production volumes are significantly lower than the growth rates of fixed assets and capital investments.

In addition to the funds for the purchase of new equipment, the process of updating the FA may require additional costs for the use of new premises, their reconstruction, new construction, etc. in case of expansion of production or its reconstruction.

We will analyze the effectiveness of credit funds, which are used along with our own funds in the process of renewal of fixed assets. Previously, we considered an example of renewal FA of production, which took place at the expense of own investments (accumulated funds) (Table 3). Let's consider the same examples of renewal of fixed assets, but on the condition that in the first year of replacement, in addition to own investment funds, loan funds are also used. We assume (for the purpose of simplifying the calculations) that in each subsequent year of renewal, the entire amount of the loan is paid together with interest. Every year, a new loan is taken, and the ratio of loan and equity capital is assumed to be equal to 50 %, that is, it is half of the own accumulation fund. The question is of interest at what marginal value of interest rate it will still be expedient for the enterprise to attract credit funds. Loan interest rates were assumed equal to 7 % and 25 %. The corresponding calculations are presented in Tables 4, 5.

Table 4

Renewal of FA and development of production potential with the involvement of credit funds (interest loan rate i= 7%)

Indicators	Years of equipment replacement				
	1	2	3	4	10
Fixed assets, c. u.	105.00	130.88	151.58	…	368.03
Product, c. u.	60.00	64.50	68.10	….	105.74
Own capital investments, c. u.	22.50	25.99	28.78	…	57.95
Credit funds, c. u.	11.25	12.99	14.39	…	28.98
Payment for credit funds, c. u.	00.00	12.04	13.90	…	28.06
General capital investments, c. u.	33.75	26.94	29.27	…	58.87
New equipment, u.	00.75	00.60	00.65	…	1.31
Increase in fixed assets, c. u.	00.00	25.88	20.70	…	40.85
Product growth, c. u.	00.00	4.50	3.6	…	7.10

Source: own calculations.

Table 5

Renewal of FA and development of production potential with the involvement of credit funds (interest loan rate *I* = 25 %)

Indicators	Years of equipment replacement				
	1	2	3	…	10
Fixed assets, c. u.	105.00	130.88	149.85	…	339.95
Product, c. u.	60.00	64.50	67.80	**...**	100.86
Own capital investments, c. u.	22.50	25.99	28.55	…	54.16
Credit funds, c. u.	11.25	12.99	14.28	…	27.10
Payment for credit funds, c. u.	00.00	14.06	16.24	…	30.90
General capital investments, c. u.	33.75	24.92	26.59	…	50.36
New equipment, u.	00.75	00.55	00.59	…	1.12
Increase in fixed assets, c. u.	00.00	25.88	18.97	…	35.10
Product growth, c. u.	00.00	4.50	3.30	…	6.10

Source: own calculations.

The analysis of tabular data characterizing the renewal of the FA of production in the three given options for resource provision (at the expense of own investment resources and with the involvement of credit funds with different percentages) shows that in the 2nd year of renewal at the expense of credit, an additional increase in production is observed. This happens because at the beginning there is no payment for the loan, and these funds are used to purchase new additional fixed assets.

We compare the main indicators of the development of the production potential and the renewal of the FA in the tenth year of replacement. Let's consider these indicators in the option of renewal with own funds and with the involvement of a loan with interest rates of 7 % and 25 %. The obtained results are presented in Table 6.

Table 6

Indicators of the development of production potential in the last year of renewal of the FA

Indicators	Investing in the renewal of FA		
	With own funds	With a loan (interest rate 7 %)	With a loan (interest rate 25 %)
Product, c. u.	101.31	105.74	100.86
Growth rate of fixed assets	3.262	3.505	3.238
Production growth rate	1.689	1.762	1.681
Growth rate of capital investments	2.423	1.744	1.492

Source: own calculations.

As can be seen from the tabular data, the development of the production potential slows down with the growth of the interest rate. It is obvious that at high interest rates, borrowing capital will be unprofitable for the company. In the considered example, in the tenth year of renewal of FA, with an interest credit rate of 25 %, the volume of production becomes smaller than in the option of renewal at the expense of own funds only. It is clear that in the case of an even higher interest rate, the use of borrowed funds will become even less effective.

An interesting question is the comparison of the ratio at different interest rates of borrowed funds and payment for the loan. After analyzing the tabular data, it can be concluded that if the loan interest rate does not exceed the rate of growth of capital investments in the option of renewal at own expense, then in each year the payment for the loan does not exceed the borrowed funds in a given year. In the case of higher loan interest rates, the payment for the loan exceeds the amount of borrowed funds.

In order to evaluate the profitability of the interest rate for the enterprise, the following approach can be proposed. It is necessary to calculate and compare the total capital investments in the second year of equipment renewal (that is, after the first loan payment). In the given example, these capital investments in the renewal option without a loan amount to 24.83, and in the two options with a loan (at rates of 7 % and 25 %), they will amount to 26.94 and 24.92, respectively. If the loan interest rate will be 25.7 %, then the total capital investment will be approximately equal to the capital investment in the renewal option without a loan. In this case, the expediency of attracting a loan seems problematic. The generalization of the proposed approach to the assessment of interest rates, especially for specific financial situations that have developed at enterprises, requires additional studies. However, the monitoring the size of investments in the process of renewal of fixed assets can provide important information regarding the optimization of resource support for the technical development of production.

Conclusions

In contemporary economic conditions, investment support for the renewal of fixed assets of production at the enterprises includes both own and credit funds. When determining the expediency of attracting credit resources, one should calculate their effectiveness and impact on the financial condition of the enterprise. When choosing an appropriate credit investment strategy for the development of production potential, important parameters of this process should be taken into account, in particular, the size of the annual payment for the loan, the annual payment from one loan unit, as well as the total amount of funds to be

paid for the entire term of the loan. These parameters depend on the amount of the credit rate and the term of crediting, and the trend of their change can be quantified. The analysis carried out in the process of modeling investment support for the development of production showed the importance of monitoring changes in the size of the main resource flows during the renewal interval, in particular the growth rates of credit funds, loan payments, own and general capital investments, fixed assets, product. The conducted study showed that the dynamics of the development of the production potential depends on the relationship between the credit interest rate and the rate of growth of capital investments in the basic version, that is, when the development of production occurs only at the expense of own investment funds. So, if the loan interest rate is lower than the specified base rate of growth, then the rate of growth of fixed assets will increase, and therefore it will be appropriate to take out a loan. In each specific case, the existing state and economic capabilities of the enterprise should be taken into account. But in general, monitoring the size of investments in capital investments can provide important information regarding the choice of a rational option for resource provision of technical development of production.

Prospects for further research

In the perspective of additional research, it is necessary to generalize the proposed approach to the assessment of interest rates, taking into account the specific financial situations that have developed at the enterprise. It is also necessary to investigate the expediency of applying the mechanism of unequal payment of the loan during the entire crediting interval.

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МЕТОДИЧНІ ТА ПРАКТИЧНІ АСПЕКТИ КРЕДИТНОЇ ПІДТРИМКИ ОНОВЛЕННЯ ОСНОВНИХ ЗАСОБІВ ПРОМИСЛОВИХ ПІДПРИЄМСТВ

У статті досліджено методичні та практичні аспекти кредитного забезпечення оновлення основних виробничих фондів підприємства. Кількісно оцінити тенденції процесу оновлення основних засобів вдалося на основі числових розрахунків параметрів цього процесу. За допомогою економіко-математичного моделювання простежено вплив залучення кредитних коштів для інвестування в оновлення основних фондів на темпи розвитку виробничого потенціалу. Запропоновано підхід до оцінювання розміру процентних ставок, розроблено практичні рекомендації щодо вдосконалення управління інвестиційними процесами на підприємстві.

Ключові слова: кредитні кошти; оновлення основних засобів; інвестиції; виробничий потенціал; кредитна ставка; термін кредитування; темп зростання.