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Use of Accelerative Amortization Methods for Investment and Innovation Development of Enterprises

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Abstract: The article deals with one of author's methods of amortization charges calculations in comparison with traditional methods. Different enterprises periodically need timely investments in reconstruction. Periodic reconstruction of an operative enterprise is not only means of economically sound modernization, but the condition of its physical existence. That is why countries with stable economy and adjusted taxation widely use linear and non-linear methods of amortization calculation with acceleration and deceleration of refundable assets, advanced in machinery and equipment. Owing to this fact, using author's methods of amortization calculation allows to solve many urgent questions for managers. The article describes proposed by the author methods of amortization charges calculation which facilitate stabilization of national economy, effectiveness of investments into main capital of enterprises.

Key words: Amortization charges · Coefficient · Linear method · Decreasing balance method · Method of cost depreciation according to the sum of profitable use period · Method of cost depreciation proportionally to the volume of production (work)

INTRODUCTION

Amortization policy plays an important role in strategic and current enterprise management, for example in pricing; regulation of tax receipts, payments and profits; evaluation of property and mortgage; determination of rent level, etc. Amortization policy development helps to answer strategic questions of enterprise management.

Various ways of cost depreciation of fixed assets and intangible assets with the help of amortization are used in practical activity [1-4]. Amount of amortization charges is one of structure elements of enterprise expenses. In the end, it influences on the result of finance-economic activity, that is why the choice of method of amortization calculation is one of the key questions of cost accounting policy of every enterprise.

The applied methods have several disadvantages. For example, linear method or even depreciation method should be used in those forms of fixed funds, in which the process of object cost transferring on production can not be functionally connected with their operation rate [5, 6].

Time does not play any role in amortization calculation process when method of cost depreciation proportionally to the volume of production is used. That is why this method should be used, when return on depreciable fixed funds in the process of amortization can be calculated exactly.

The original cost of fixed funds object can never be depreciated, using decreasing balance method. Decreasing balance method and method of depreciation of cost according to the sum of years number of profitable use period are based on principle of accrual forming of amortization charges cost. These methods allow to depreciate maximum amortization cost during the first years of fund utilization. Besides, using method of cost depreciating according to the sum of years number, reverse accrual number may be applied and amortization cost may be decelerated during the first years of fund utilization, but in contradiction to author's methods, this method does more acute fluctuations of amortization value year in year out [7].

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Table 1: Calculation of amortization charges sum, thousand dollars

Calculation [1] Period	1 (table 2) Author's method [1] 1 according to the even number of profitable use period if the planned step (2f) of amortization charges acceleration is used	2 (table 3) Linear method	3 (table 4) Decreasing balance method	4 (table 5) Method of cost depreciation according to the sum of profitable use period	5 (table 6) Method of cost depreciation proportionally to the volume of production (work)
1	305556	166670	300000	285714	225000
2	250000	166670	210000	238095	230000
3	194444	166670	147000	190476	175000
4	138889	166670	102900	142857	160000
5	83333	166670	72030	95238	70000
6	27778	166670	50421	47620	140000
n = 6	1000000	1000020	882351	1000000	1000000

Table 2: Calculation of amortization charges sum according to author's method if the planned step (*2f*) of acceleration is used, thousand dollars

Period	K	(m + K*f)	*100%	Sum, thousand dollars C*(3*4)/100	Accumulated wear and tear	Depreciated cost
1	+ 5	m + 5f	30,556	305556	305556	694444 (1000000-305556)
2	+ 3	m + 3f	25,000	250000	555556 (305556 + 250000)	444444 (1000000-555556)
3	+ 1	m + f	19,444	194444	750000 (555556 + 194444)	250000 (1000000-750000)
4	-1	m-f	13,889	138889	888889 (750000 + 138889)	111111 (1000000-888889)
5	-3	m-3f	8,333	83333	972222 (888889 + 83333)	27778 (1000000-972222)
6	-5	m-5f	2,778	27778	1000000 (972222 + 27778)	0 (1000000-1000000)
n = 6			100,000	1000000		

One of author's methods presented below solves the problems of traditional amortization calculation methods. In accordance with linear method only equal sum of amortization charges may be depreciated. The offered author's methods are based on the fact that annual sum of amortization charges is calculated proceeding from original cost or current value (in case of reassessment) and amortization norm, calculated basing on profitable use period of an object and correlation of linear, step and corrective coefficients.

Next we'll present the approbation of author's method of amortization calculation [8, 9] when the value of original cost of the object *C* makes 1 milliard dollars.

In the calculations *n* means the profitable use period of the fixed assets object. For example, *n* makes 6 (or even number).

In the calculations *m* means linear coefficient, which determines average amortization norm, calculated basing on the profitable use period of the object. Linear coefficient calculation is in the formula: $m = 1 / n$. So the linear coefficient makes 0,1667 ($m = 1 / n = 1 / 6$).

In the calculations according to author's methods (Table 2), step coefficient *f* is also used, which determines difference sum of amortization value in different periods. Step coefficient is calculated according to the formula: $f = 1 / n^2$. As a result, for example, the step coefficient makes 0,0278 ($f = 1 / n^2 = 1 / 36$).

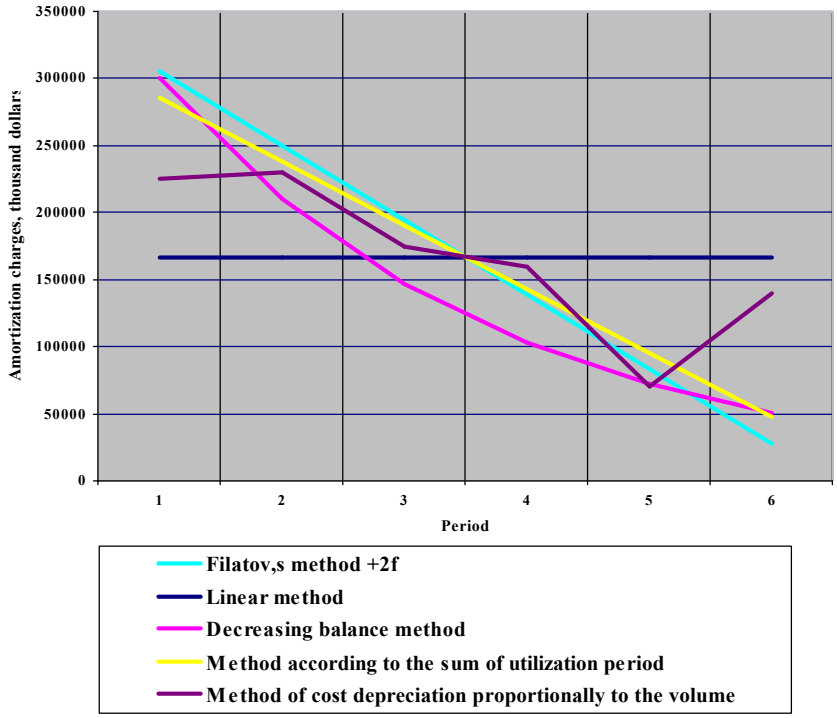
Corrective coefficient *K* or amortization charges regulator, used in author's methods is the key coefficient, which determines degree of interconnection between linear and step coefficients and specified independently. Basing on the defined management goals, the coefficient determines original acceleration or deceleration of amortization charges.

Using author's methods, the obligatory conditions must be observed:

- The difference between the linear coefficient value and the value of product of corrective and step coefficients must not be less than zero: $m-K*f > 0$;
- All corrective coefficients sum must be equal zero: $?K = 0$;
- $K < n$.

The calculation of amortization charges sum according to the basic methods is presented in Table 1 and picture 1.

According to linear depreciation method amortization norm in the example makes 16,667% from the amortized cost (100% / 6), amortization charges sum-166 670 thousand dollars (1 000 000 thousand dollars x 16,667%). Amortization calculation during the planned period according to linear method is presented in Table 3.



Picture 1: Comparison of amortization charges value, calculated according to the basic methods

Table 3: Calculation of amortization charges sum according to linear method, thousand dollars

Period	m*100%	Sum, C * (6/100)	Accumulated wear and tear	Depreciated cost
1	16,667	166670	166670	833330 (1000000-166670)
2	16,667	166670	333340 (166670 * 2)	666660 (1000000-333340)
3	16,667	166670	500010 (166670 * 3)	499990 (1000000-500010)
4	16,667	166670	666680 (166670 * 4)	333320 (1000000-666680)
5	16,667	166670	833350 (166670 * 5)	166650 (1000000-833350)
6	16,667	166670	1000020 (166670 * 6)	-20 (1000000-1000020)
n = 6	100,002	1000020		

Table 4: Amortization calculation by decreasing balance method, thousand dollars

Period	Annual sum of amortization	Accumulated wear and tear	Depreciated cost
1	300000 (1000000 x 30%)	300000	700000(1000000-300000)
2	210000 (700000 x 30%)	510000(300000 + 21000)	490000(1000000-510000)
3	147000 (490000 x 30%)	657000(510000 + 81 000)	343000(1000000-657000)
4	102900 (343000 x 30%)	759900(657000 + 102900)	240100(1000000-759900)
5	72030 (240100 x 30%)	831930(759900 + 72030)	168070(1000000-831930)
6	50421 (168070 x 30%)	882351(831930 + 50421)	117649(1000000-882351)
n = 6	882351		

Table 5: Amortization calculation by method of cost depreciation according to the sum of profitable use period, thousand dollars

Period	Annual sum of amortization	Accumulated wear and tear	Depreciated cost
1	285714 (1000000 x 6/21)	285714	714286(1000000-285714)
2	238095 (1000000 x 5/21)	523809(285714 + 238095)	476191(1000000-523809)
3	190476 (1000000 x 4/21)	714285(523809 + 190476)	285715(1000000-714285)
4	142857 (1000000 x 3/21)	857142(714285 + 142857)	142858(1000000-857142)
5	95238 (1000000 x 2/21)	952380(857142 + 95238)	47620(1000000-952380)
6	47620 (1000000 x 1/21)	1000000(952380 + 47620)	0(1000000-1000000)
n = 6	1000000		

Table 6: Amortization calculation by method of cost depreciation proportionally to the volume of production (work), thousand dollars

Period	Volume of output (unit)	Amortization sum according to the period	Accumulated wear and tear	Depreciated cost
1	450	225000(450 x 500)	225000	775000(1000000-225000)
2	460	230000(460 x 500)	455000(225000 + 230000)	545000(1000000-455000)
3	350	175000(350 x 500)	630000(455000 + 175000)	370000(1000000-630000)
4	320	160000(320 x 500)	790000(630000 + 160000)	210000(1000000-790000)
5	140	70000(140 x 500)	860000(790000 + 70000)	140000(1000000-860000)
6	280	140000(280 x 500)	1000000(860000 + 140000)	0(1000000-1000000)
n = 6	2000	1000000		

Amortization norm of the object makes 30%, if using decreasing balance method. This fixed rate relates to depreciated cost at the end of every period (Table 4).

Amortization calculation by method of cost depreciation according to the sum of profitable use period is determined basing on the sum of numbers of object's work period, which makes 21 (accrual number). At every utilization period of the object amortization value is calculated (6/21; 5/21; 4/21; 3/21; 2/21; 1/21) in accordance with the original cost of the object (Table 5).

In case when amortization is calculated by method of cost depreciation proportionally to the volume of production (work), let us suppose that the object is planned to the volume of production output in the amount of 2 000 units. Amortization costs per unit are specified in such a way: 1 000 000 / 2 000 = 500 thousand dollars. Amortization charges periods, when amortization is calculated by method of cost depreciation proportionally to the volume of production (work), is presented in table 6.

One of the major factors of efficiency increase of the enterprises innovative development is being provided with financial resourses [8-10].

CONCLUSION

Countries with stable economy, adjusted taxation widely use linear and non-linear methods of amortization calculation with acceleration and deceleration of refundable assets. That is why author's methods of amortization policy, as improved, flexible and exact, help to solve a very important problem-to support and maintain economy stabilization of the country.

The application of author's methods of amortization calculation also helps enterprise managers in current and long-term administration. Besides, author's methods help to raise management efficiency of investment sources of assets for cash flow generation as investment in renewal of fixed funds structure.

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