EXCEL'S CALCULATION OF BASIC ASSETS AMORTISATION VALUES

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Abstract : *For Excel's calculation of basic (fixed) assets amortisation values, the investigated economic and mathematical foundation with required values and their relations were used. The investigated and introduced theory is adapted to Excel's calculations of fixed assets amoritisation based on today's needs. All values for Excel's calculations are sorted into input and output, and input to main and nested. Two methods for calculating fixed assets amortisation were introduced using Excel.The first method is based on a linear decreasing function, G (t) = G0 (1-pt), which presents the simple interest calculation of the reduced equities for equal periodic amortisationvalues.The second method is based on the exponential degrading function, G (t) = G0qt, which presents a complex interest calculation of the reduced equities for periodic amortisation amounts in a descending sequence.The continuity of the introduced functions stems from the continuity of: the life of the fixed asset, periodic amortisation, accumulated amortisation and non-amortized amount (residual value) of the fixed asset.It is particularly important to introduce dates with the exact time, for the beginning and the end of each amortisation period of the fixed asset.The theory for Excel's calculation of the fixed asset output values for an arbitrary (planned or unplanned) term has also been explored and introduced.Such calculations relate mainly to terms of alienation, permanent damage, permanent loss of the process function of a fixed asset and periodic accounting reporting.*

Key words: *Asset, values, amortisation, amortisation.*

INTRODUCTION

The aim of this paper is to introduce the researched economic, mathematical and Excel basis for calculating the amortization of fixed assets of a work process in accordance with International Accounting Standards (IAS). In the general theoretical part of the paper there are definitions of basic concepts.

A fixed asset is tangible or intangible assets of a work process that are not intended for the market. Examples of tangible assets are: buildings, ships with a carrying capacity of over 1000 GRT, motor vehicles, various equipment and machinery and the like. Intangible assets include: investments in research and development, patents, licenses, copyrights, work promotions, goodwill and the like. The book value of a fixed asset is the purchase value increased by costs until the date of its introduction into the work process.

Depreciation of a fixed asset is the gradual loss of its use value in the predicted time interval due to its wear, stagnation or obsolescence. Thus, the amortization of a fixed asset depends on: the intensity of its consumption, the passage of time and technological progress. International Accounting Standards prescribe annual amortization rates by fixed asset category.

For some fixed assets, the annual amortization rates for 2018 have the prescribed amounts:

(1) buildings and vessels with a carrying capacity exceeding 1 000 GRT, 5% = 0.05

(2) basic herd and passenger cars, 20% = 0.2

(3) intangible assets, vehicles, mechanization equipment, etc., 25% = 0.25

(4) computers and computer equipment, programs and computer networks, 50% = 0.5

They are prescribed; annual, semester, quarterly, monthly, weekly (weekly) and daily time intervals, ie periods expressed in days, hours, minutes and seconds, depending on the type of fixed asset and its shelf life. The known regular relations between the stated time intervals are: 1 year = 365 days, 1 semester = 182.5 days = 182 days and 12 hours, 1 quarter = 91.25 days = 91 days and 6 hours, 1 month = 30.41 (6) days = 30 days and 10 hours. Some term (T) of the time interval has a date and time expressed in hours minutes and seconds, or in Excel form, T = dd.mm.yyyy hh: mm: ss. The length of the fixed asset's useful life is determined by the number of amortization periods from the date of introduction into the work process. The number of amortization periods of a fixed asset depends on the periodic amortization rate. Among other things, IASs prescribe 1 year as the shortest useful life and the lowest carrying amount of a fixed asset expressed in US dollars. Based on IAS, the amortization rate of a fixed asset is inversely proportional to its useful life. To extend the useful life of a fixed asset, it is allowed to reduce its amortization rate. To shorten the useful life of a fixed asset, it is allowed to increase its amortization rate to twice its amount.

1. OLD METHODS OF CALCULATING THE AMOUNT OF DEPRECIATION OF FIXED ASSETS

There are mainly two methods of calculating the amortization of fixed assets, known as: (1) Linear method and (2) Functional method.

According to the Linear Method, the calculation of amortization is mostly annual, with equal annual amounts of amortization over the life of the fixed asset. In this case, the basis for calculating amortization is the carrying amount of the fixed asset for all amortization periods. For some fixed assets, periodic residual values of the fixed asset are used as the basis for calculating amortization.

According to the Functional Method for some fixed assets, the basis for calculating amortization is: number of products, volume of production, degree of capacity utilization, number of kilometers traveled, volume of

transport performed, number of working hours and the like. For the calculations, mainly a calculator and a simple interest account with annual amortization periods were used. The date of introduction of the fixed asset into the work process is the first day of the month of the current year in relation to the regular term from the previous month. The term of accounting reporting on the amounts of amortization of fixed assets is (December 31) of the current year. These methods, based on today's needs, do not have an appropriate economic and mathematical basis for calculating the amount of quantities related to the amortization of fixed assets. The authors of the paper investigated and introduced two new methods with a new economic and mathematical basis, using Excel, to calculate the amount of amortization of fixed assets.

2. ECONOMIC AND MATHEMATICAL BASIS FOR EXCEL'S CALCULATION OF THE AMOUNT OF DEPRECIATION OF FIXED ASSETS

The authors of the paper investigated and introduced a new economic, mathematical and Excel basis for calculating the amortization of fixed assets.

The introduced values of the economic base are: book value of fixed assets, annual amortization rate, number of amortization periods shorter than 1 year, length of one amortization period, periodic amortization rate, periodic unamortized amount of fixed assets, periodic amortization amount, accumulated amortization amount, start dates and the end of each amortization period of the fixed asset.

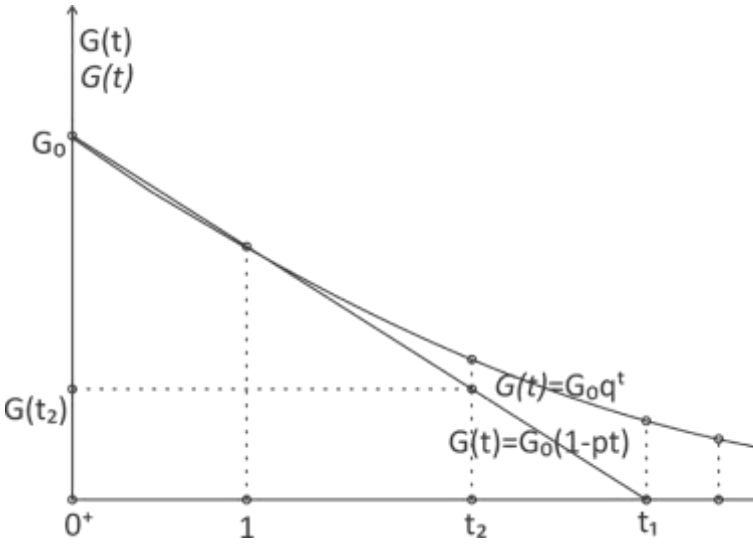

Figure 2.1. Function graphs G(t) =G_0(1-pt) i *G(t)*=G_0q^t

The mathematical basis for equal amounts of amortization of fixed assets is presented by a linear decreasing (descending) function and a simple interest calculation in the form, G (t) = G_0 (1-pt), for t∈ [0, t_1], Figure 2.1 Function G (t) is the non-amortizated value of the fixed asset, (G_0) the book value, (p) the periodic amortization rate and (t) the number of the amortization period of the fixed asset.

The mathematical basis for the decreasing series of amortization of fixed assets is presented by an exponential, decreasing function and a complex interest calculus in the form, G (t) = G_0q^t, for t> 0 and (0 <q <1), Figure 2.1. The function G (t) is the non-amortizated value of the fixed asset, (G_0) the book value, (q) the periodic amortization factor and (t) the number of the amortization period of the fixed asset.

Adequate Excel calculations are derived from the economic and mathematical basis for the amortization of fixed assets; equal periodic amounts of amortization and amounts that are in descending order. During the calculation, it is not allowed to change the amortization rate of the fixed asset. Depreciation of all fixed assets is an intangible cost of each registered activity and affects the balance sheet and income statement.

This is followed by the introduction of the first new method for Excel's calculation of

the amount of quantities for equal amounts of amortization of fixed assets.

3. EXCEL CALCULATION OF THE AMOUNT OF OUTPUTS FOR EQUAL AMOUNTS OF DEPRECIATION OF FIXED ASSETS

In the calculations, Excel will use: default amounts of input quantities, introduced formulas of nested quantities and introduced formulas for output quantities of amortization of fixed assets.

Default input sizes:

(1) the carrying amount of the fixed asset (G_0),

(2) annual amortization rate (p_1),

(3) the lengths of equal amortization periods in days (D),

(4) the amortization start date of the fixed asset (T_0 = dd.mm.yyyy hh: mm: ss), and

(5) coefficient of correction of the lifetime of total amortization of fixed assets ($0 < k \leq 1$).

The correction coefficient (k) for the duration of the total amortization of the fixed asset is determined by the percentage rate (P) for ($0\% \leq P < 100\% \Leftrightarrow 0 \leq P < 1$), where ($k = 1-P$)

The required nested sizes are:

(1) number of amortization periods in the year, $m = 365 / D$,

(2) periodic, relative amortization rate, $p = p_1 / m$,

(3) the useful life of the fixed asset of its total amortization, $t_1 = 1 / p$; from $G(t) = G_0 (1-pt) = 0$ and $t = t_1$, Figure 2.1.

(4) planned amortization life of fixed assets, $t_2 = t_1 * k$, for $t_2 \leq t_1$

(5) term of completion of the planned duration of amortization, $Tt_2 = T_0 + D * t_2$

(6) term of end of total amortization duration, $Tt_1 = T_0 + D * t_1$

Required output sizes are:

(1) terms of amortization calculation, $T_i = T_0 + i * D$, for $(k = 1)$ $i \in \{0^+, 1, \ldots, t_1\}$, for $(0 < k < 1)$ $i \in \{0^+, 1, \ldots, t_2\}$,

(2) the unamortized amount (residual value) of the fixed asset, $G_i = G_0 * (1-p*i)$,

(3) the amount of amortization at the end of the current period, $a_i = G_{(i-1)} - G_i$

(4) the amount of accumulated amortization until the end of the current period, $A_i = i * a_1$

Fixed asset amortization periods have ordinal numbers, $i \in \{0^+, 1, \ldots, t_2, \ldots, t_1\}$, where ($t_2$) and ($t_1$) are real numbers in decimal notation, and (0^+) is the right environment (0). Thus, a linear, decreasing function, $G(t) = G_0 (1-pt)$ is continuous, for $t \in [0^+, t_1]$ and $G(t) \in [G_0, 0]$. For automatic expression of ordinal numbers, $i \in \{0^+, 1, \ldots, t_2, \ldots, t_1\}$, the period of amortization of the fixed asset, in the creation of the example will be used Excel function (IF) with introduced conditional transitions.

During the amortization in the term (T_z) the fixed asset can be alienated or for some reason permanently damaged, with the need to calculate the output values for the term (T_z). Thus, the term (T_z) can be any arbitrary, unplanned or planned financial reporting term for calculating the amortization output of a fixed asset.

The authors of the paper investigated and introduced the economic, mathematical and Excel basis for calculating the amount of output amortization of fixed assets for the term (T_z).

For the term (T_z = dd.mm.yyyy hh: mm: ss) from ($T_0 \leq T_z \leq Tt_2$), it follows:

(1) number of fixed asset amortization period, $z = (T_z - T_0) / D$,

(2) integer number of amortization periods, $Z = INT(z)$,

(3) unamortized value of fixed asset, for $t = Z$, $G_Z = G_0 * (1-p * Z)$,

(4) unamortized value of fixed asset, for t = z, $G_z = G_0 * (1-p * z)$,

(5) accumulated amortization amount, for t = z, $A_z = G_0 * p * z$,

(6) the amount of amortization for the current period, $a_z = G_Z - G_z$

Example 3.1.

The book value of one fixed asset is 11,500 KM, and the beginning of its working process is 04/17/2018 09:28:15. The annual amortization rate is 15.2% linearly on the carrying amount of the fixed asset. The length of the amortization period is 1 year. The correction coefficient is 0.825 in relation to the useful life of the total amortization of the fixed asset. Using Excel, calculate the periodic amounts of output values of amortization of fixed assets and especially for the planned period of financial reporting, 31.12.2020 23:59:59.

Default input sizes:

G_0 = 11,500 KM (book value of fixed assets),

p_1 = 15, 2% = 0,152 (annual amortization rate of fixed assets),

T_0 = 17.04.2018 09:28:15 (date of the beginning of the working process of the fixed asset),

D = 1 year = 365 days (lengths of equal amortization periods),

k = 0.825 (total amortization life adjustment coefficient), i

T_z = 31.12.2020 23:59:59 (planned term of accounting reporting).

Calculation of amortization for the life of a fixed asset, using a simple interest account, with equal amounts of amortization for equal periods, Example 5.1.1.	
Table 1: Amounts of input quantities	
The carrying amount of a fixed asset, G0=	11.500,000
Amortization start date, T0=dd.mm.yyyy hh:mm:ss	17.04.2018 09:28:15
Annual amortization rate, p1=	0,152 000 000
Length of the amortization period in days, D=	365,000 000 000
Number of amortization periods in one year, m=365/D=	1,000 000 000
Periodic amortization rate, p=p1/m=	0,152 000 000
The useful life of a fixed asset in total, linear amortization, t1=1/p=	6,578 947 368
Fixed life expectancy correction factor, (0<k<1) i (k=1), k=	0,825 000 000
Planned life of fixed assets, t2=t1*k=	5,427 631 579
Deadline for completion of planned amortization, Tt2=T0+D*t2=	19.09.2023 11:31:24
The term total, linear amortization of a fixed asset, Tt1=T0+D*t1=	12.11.2024 17:02:59
Table 2: Amounts of output values of the 1st row of amortization Table 4	
Term 1. Amortization period, T1=T0+D=	17.04.2019 09:28:15
Amount of non - amortizated part of fixed assets, for t=1, G1=G0*(1-p*1)=	9.752,000
Amount of accumulated amortization of fixed assets, for t=1, A1=1*a1=	1.748,000
Amortization amount for the current period, a1=G0-G1=	1.748,000
Table 3: Amounts of size for any term amortization of an asset	
Amortization period required (Tt0≤ Tz≤ Tt2), Tz=dd.mm.yyyy hh:mm:ss=	31.12.2020 23:59:59
Number of amortization periods from the term (T0) do (Tz), z=(Tz-T0)/D=	2,711 247 590
Integer units of number (z), Z=INT(z)=	2
Amount of non - amortizated part of fixed assets, for t=Z, GZ=G0*(1-p*Z)=	8.004,000
Amount of non -amortizated part of fixed assets, for t=z, Gz=G0*(1-p*z)=	6.760,739
Amount of accumulated amortization of fixed assets, for t=z, Az=G0*p*z=	4.739,261
Amortization amount for the current period, az=GZ-Gz=	1.243,261

Figure 3.1. Spreadsheets 1, 2 and 3 from Excel List1

The introduced economic and mathematical basis was used for Excel calculations of the amount of output values of amortization of fixed assets, Excel List1 (Figures 3.1 and 3.2). Figure 3.1. contains spreadsheets 1, 2 and 3 from Excel List1. Figure 3.2. contains spreadsheet 4 and histogram overview of the amount of output values of amortization of fixed assets. Figures 3.1. and 3.2. are a static variant of Excel's dynamic construction of Example 3.1..Excel's List1 (1) was created by copying List1 and is used for amortization calculations of other fixed assets. On Excel sheets, cells with input size amounts are yellow, and cells for output size amounts are green. Excel List1 (1) is reserved for application. Users in the application can change the amounts of input sizes in all combinations (column (E), yellow cells).

Table 4: Overview of the amount of output values by periods of amortization of fixed assets				
Ordinal number of the amortization period (i)	Amortization calculation terms (Ti)	Unamortized cost of fixed assets (Gi)	Amount of accumulated amortization (Ai)	Amortization amount in the current period (ai)
0	17.04.2018 09:28:15	11.500,000	0,000	
1	17.04.2019 09:28:15	9.752,000	1.748,000	1.748,000
2	16.04.2020 09:28:15	8.004,000	3.496,000	1.748,000
3	16.04.2021 09:28:15	6.256,000	5.244,000	1.748,000
4	16.04.2022 09:28:15	4.508,000	6.992,000	1.748,000
5	16.04.2023 09:28:15	2.760,000	8.740,000	1.748,000
5,427 631 579	19.09.2023 11:31:24	2.012,500	9.487,500	747,500
6	15.04.2024 09:28:15	1.012,000	10.488,000	1.000,500
6,578 947 368	12.11.2024 17:02:59	0,000	11.500,000	1.012,000

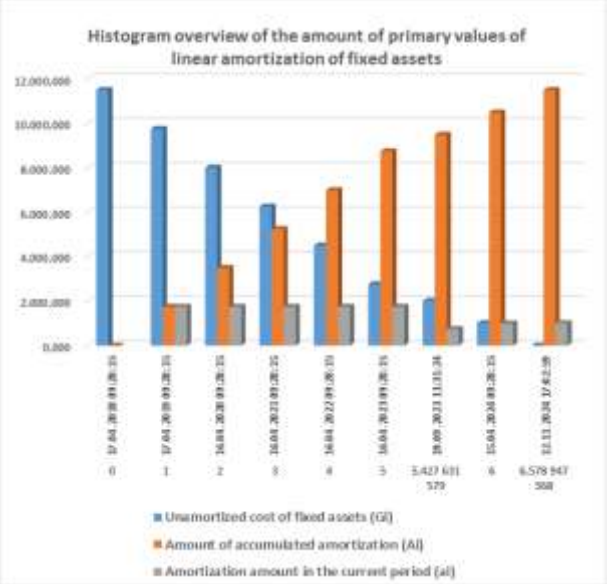

Figure 3.2. Spreadsheet 4 and histogram from Excel List1

This is followed by the introduction of another new method of Excel calculation of the amount of output quantities with the amounts of amortization of fixed assets in descending order.

4. EXCEL CALCULATION OF THE AMOUNT OF OUTPUT SIZES WITH THE AMOUNTS OF DEPRECIATION OF FIXED ASSETS IN DECREASE

The mathematical basis for Excel's calculation of the amount of amortization in descending order is a descending exponential function, $G(t) = G_0q^t$ for $t > 0$ and $0 < q < 1$ which presents a complex interest account for reduced principal.

Applied to the continuous and periodic amortization of fixed assets, from $G(t) = G_0q^t$ derive the names and designations of quantities:

(1) G_0 (amount of book value of fixed asset),

(2) G (t) (amount of unamortized cost of fixed asset),

(3) q (periodic amortization factor of the fixed asset), i

(4) t (elapsed amortization time for periods $i \in \{0^+, 1,...\}$).

The previous quantities are the basis for the introduction of other required quantities and their relations. To calculate the amount of required output values, Excel will use the amounts of the main and nested sizes.

Major sizes:

(1) G_0 (iznos knjigovodstvene vrijednosti osnovnog sredstva),
(2) T_0=dd.mm.yyyy hh:mm:ss (termin početka amortizacije osnovnog sredstva),
(3) p_1 (godišnja stopa amortizacije osnovnog sredstva),
(4) D (dužina perioda amortizacije iskazana u danima), i
(5) k (koeficijent korekcije vijeka trajanja osnovnog sredstva).

The correction factor (k) for the life of the fixed asset depends on the percentage rate (P) from the interval ($0\% \leq P < 100\%$) $\Leftrightarrow$ ($0 \leq P < 1$). The correction factor (k) may have the following amounts:

(1) k = 1 (for the optimal life of the fixed asset),

(2) k = 1-P (to shorten the optimal life of the fixed asset), and

(3) k = 1 + P (to extend the optimal life of the fixed asset).

To extend the optimal life of the fixed asset, the percentage rate (P) may have the amount ($P > 100\%$) $\Leftrightarrow$ ($P > 1$), if the fixed asset is in the planned process function.

Nested sizes:

(1) m = 365 / D (number of fixed asset amortization periods in a year),

(2) $q_1 = 1-p_1$ (annual amortization factor of fixed assets),

(3) $q = q_1 \wedge (1 / m)$ (periodic amortization factor of fixed asset),

(4) p = 1-q (periodic amortization rate of fixed assets),

(5) $t_1 = 1 / p$ (optimal service life of fixed assets, for k = 1),

(6) $t_2 = t_1 * k$ (planned life of the fixed asset, for $0 < k < 1 \Leftrightarrow t_2 < t_1$, for $k = 1 \Leftrightarrow t_2 = t_1$ and for $k > 1 \Leftrightarrow t_2 > t_1$),

(7) $Tt_1 = T_0 + t_1 * D$ (term of optimal end of life of fixed assets), and

(8) $Tt_2 = T_0 + t_2 * D$ (term of the planned end of the life of the fixed asset).

Excel uses the amounts of the main quantities to calculate the amounts of nested quantities, and based on the introduced formulas performs calculations of the amounts of the required output quantities.

Required output sizes with introduced formulas:

(1) $T_i = T_0 + i * D$, for $i \in \{0^+, 1, \ldots, t_2\}$ (terms of fixed asset amortization period),

(2) $G_i = G_0 * q \wedge i$ (amounts of unamortized part of fixed assets),

(3) $A_i = G_0 * (1-q \wedge i)$ (amounts of accumulated amortization of fixed assets), and

(4) $a_i = G_{i-1}-G_i$ (amounts of amortization of fixed assets in the current period).

For any term (T_z) from the interval ($T_0 \leq T_z \leq Tt_2$) the following quantities were investigated and introduced:

(1) T_z = dd.mm.yyyy hh: mm: ss (any term as input quantity),

(2) $z = (T_z-T_0) / D$ (interval length (T_z-T_0) in days; (z) decimal number),

(3) Z = INT (z) (integer units of number (z)),

(4) $G_Z = G_0 * q \wedge Z$ (unamortized value of fixed asset, for (i = Z)),

(5) $G_z = G_0 * q \wedge z$ (unamortized value of fixed asset, for (i = z)),

(6) $A_z = G_0 * (1-q \wedge z)$ (amount of accumulated amortization of fixed assets, for (i = z)), and

(7) $a_z = G_z-G_Z$ (amount of amortization of fixed assets for the current period).

The amounts of input quantities from Example 3.1 will be used for Excel calculations. with the aim of comparing the amount of output quantities for the two introduced calculation methods.

Example 4.1.

The book value of one fixed asset is 11,500 KM, and the beginning of its working process is 04/17/2018 09:28:15. The annual amortization rate is 15.2% exponentially in relation to the book value of the fixed asset. The length of the amortization period is 1 year. The correction factor is 0.825 in relation to the life of the optimal amortization of the fixed asset. Using Excel, calculate the periodic amounts of output values of amortization of fixed assets and especially for the planned period of financial reporting, 12.31.2020 23:59:59.

Default input sizes:

G_0 = 11,500 KM (book value of fixed assets),

p_1 = 15.2% = 0.152 (annual amortization rate of fixed assets),

T0 = 04.17.2018 09:28:15 (date of the beginning of the working process of the fixed asset),

D = 1 year = 365 days (lengths of equal amortization periods),

k = 0.825 (optimal amortization life correction coefficient), and

T_z = 12.31.2020 23:59:59 (planned term of financial reporting).

The introduced economic and mathematical basis was used for Excel calculations of the amount of output values of amortization of fixed assets, Excel List2 (Figures 4.1 and 4.2). Figure 4.1. contains spreadsheets 1, 2 and 3 from Excel List2. Figure 4.2. contains spreadsheet 4 and a histogram overview of the amount of output values of amortization of fixed assets.

Excel's List2 (1) was created by copying Lsta2 and is used for amortization calculations of other fixed assets. On Excel

sheets, the cells with the amounts of the input sizes are yellow, and the cells for the amounts of the output sizes are green. Figures 4.1. and 4.2. Excel's List2 presents a static version of Excel's creation of Example 4.1. Excel's List2 (1) is intended for use, where users can change the amounts of input sizes in all combinations (column (E), yellow cells).

Amortization calculation for the life of a fixed asset, using a complex interest account, with convexly decreasing amortization amounts, Example 4.1.	
Table 1: Amounts of input quantities	
The carrying amount of a fixed asset, G0=	11.500,000
The carrying amount of a fixed asset, T0=dd.mm.yyyy hh:mm:ss	17.04.2018 09:28:15
Annual amortization rate, p1=	0,152 000 000
Annual amortization factor, q1=1-p1=	0,848 000 000
Length of the amortization period in days, D=	365,000 000 000
Number of amortization periods in one year, m=365/D=	1,000 000 000
Periodic amortization factor, q=q1^(1/m)=	0,848 000 000
Periodic amortization rate, p=1-q=	0,152 000 000
The life of the fixed asset of optimal amortization, t1=1/p=	6,578 947 368
Fixed life expectancy correction factor ,0<k<1, k=1 i k>1, k=	0,825 000 000
Adjusted fixed asset life, t2=t1*k=	5,427 631 579
The date of completion of the planned amortization of fixed assets, Tt2=T0+D*t2=	19.09.2023 11:31:24
The term of optimal amortization of fixed assets, Tt1=T0+D*t1=	12.11.2024 17:02:59
Table 2: Amounts of output values of the 1st row of amortization Table 4	
Term the first period of amortization, T1=T0+1*D=	17.04.2019 09:28:15
Amount of unamortized part of fixed assets, for t=1, G1=G0*q^1=	9.752,000
Amount of accumulated amortization of fixed assets, for t=1, A1=G0*(1-q^1)=	1.748,000
Amortization amount for the current period, a1=G0-G1=	1.748,000
Table 3: Amounts of values for any fixed asset amortization period	
Amortization period required (T0≤ Tz≤ Tt2), Tz=dd.mm.yyyy hh:mm:ss=	31.12.2020 23:59:59
Number of amortization periods from the term (T0) do (Tz), z=(Tz-T0)/D=	2,711 247 590
Integer units of number (z), Z=INT(z)=	2
Amount of unamortized part of fixed assets, for t=Z, GZ=G0*q^Z=	8.269,696
Amount of unamortized part of fixed assets, for t=z, Gz=G0*q^z=	7.354,637
Amount of accumulated amortization of fixed assets, for t=z, Az=G0*(1-q^z)=	4.145,363
Amortization amount for the current period, az=GZ-Gz=	915,059

Figure 4.1. Spreadsheets 1, 2 and 3 from Excel List2

Table 4: Overview of the amount of output values by periods of amortization of fixed assets				
Ordinal number of the amortization period (i)	Amortization calculation terms (Ti)	Unamortized cost of fixed assets	Amount of accumulated amortization (Ai)	Amortization amount in the current period (ai)
0	17.04.2018 09:28:15	11.500,000		
1	17.04.2019 09:28:15	9.752,000	1.748,000	1.748,000
2	16.04.2020 09:28:15	8.269,696	3.230,304	1.482,304
3	16.04.2021 09:28:15	7.012,702	4.487,298	1.256,994
4	16.04.2022 09:28:15	5.946,771	5.553,229	1.065,931
5	16.04.2023 09:28:15	5.042,862	6.457,138	903,909
5,427631579	19.09.2023 11:31:24	4.699,557	6.800,443	343,305
6	15.04.2024 09:28:15	4.276,347	7.223,653	423,210
6,578947368	12.11.2024 17:02:59	3.887,030	7.612,970	389,317

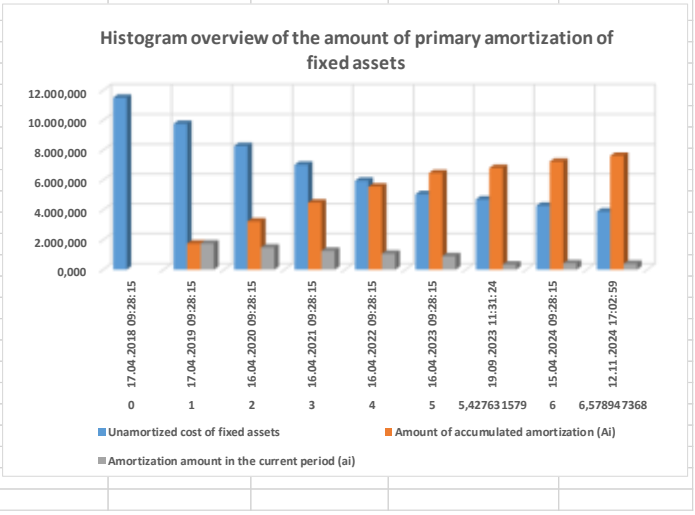

Figure 4.2. Spreadsheet 4 and histogram from Excel List2

CONCLUSION

The choice of method for calculating the amount of output values of amortization of fixed assets is made by the legal entity as their owner. The authors of the paper recommend the application of the first method of Excel calculations for the amortization of buildings, furniture, white goods, intangible fixed assets and the like. By applying this method, the useful life of the fixed asset, in addition to the amortization rate (p) is affected by the correction coefficient (k) of the amortization life (t_2) and the unamortized amount (G (t_2) ≥0) of the fixed asset. For (k = 1) is the useful life of total amortization (t_2 = t_1) and the unamortized amount of fixed assets (G (t_2) = G (t_1) = 0). For (0 <k <1) is the planned amortization period (t_2) and the unamortized amount of fixed assets (G (t_2)> 0). In this case, the amounts of periodic amortization are equal for equal periods.

By applying the second method, the periodic amounts of residual values and the periodic amounts of amortization of the fixed asset decrease exponentially. The amortization life (t_2) of a fixed asset depends on the amount of its correction coefficient ($k > 0$), in relation to the optimal amortization life (t_1), for ($k = 1$) and ($t_2 = t_1$). By applying this method, the unamortized amount of the value of a fixed asset always has a value greater than zero ($G(t_2) > 0$). If the fixed asset does not have a planned use function, then a special commission writes off its unamortized amount. If the fixed asset has a planned use function, then the commission determines the new amount of its book value. This method is useful for Excel calculations of amortization output values of all fixed asset categories.

Of particular importance is the researched and introduced economic and mathematical basis for Excel's calculation of the amount of output values of amortization of fixed assets, for any planned or unplanned term (T_z) from the life of the fixed asset.

The introduced Excel calculation has, among other things, application:
(1) after the alienation of the fixed asset,
(2) after permanent damage,
(3) after an unplanned loss of use function,
(4) for periodic financial reporting, and
(5) for unplanned reporting of fixed asset amortization amounts.

Thus, the introduced two new methods of Excel calculations of the amount of output values of amortization of fixed assets, can mainly meet today's needs of users

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