

System of Management Indicators

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Abstract: *The efficiency of an entity's activity is closely related to the way resources are handled. Good management of the resources of an entity allows the objectives to be attained, the set deadlines met and the costs foreseen.*

Management rates express the efficiency with which the assets and capital of the enterprise are used, underlying the characterization of their rotation speed.

Keywords: *number of rotation, duration of a rotation, efficiency, financial management*

Introduction

The rotation speed of the balance sheet items can be determined on the basis of two indicators, namely: the number of rotation and the duration of a rotation in days. These indicators measure: the degree of efficiency with which the company uses the resources at its disposal; the rate of cash changeover and debt renewal; the pace of renewal of the assets, namely the liquidity of commercial stocks and receivables, on the one hand, and the eligibility of operating debts, on the other. The analysis of the financial management of the enterprise is carried out mainly on two main directions, namely: the analysis of the liabilities ratio, which includes the analysis of the rate of rotation of the permanent capital, of the equity and of the debts and the analysis of the asset management rates that are based on the analysis of the rotation speed of fixed assets, inventories and receivables.

Methodologically, this analysis is based on management or rotation rates.

Table no. 1 Categories of management rates

1. According to the expressing form:	a) <i>number of rotations</i> (n_r) – expresses how many times an element of the assets or liabilities changes into liquidities throughout a financial exercise: $n_r = \frac{\text{Turnover (Ca)}}{\text{Assets or liabilities element (E}_a \text{ sau E}_p)}$
	b) <i>rotation duration in days</i> (d_z) - measures the duration in days necessary for the elements of the assets for refunding them in liquidities or for the payment of debts through the turnover: $d_z = \frac{\text{Assets or liabilities elements (E}_a \text{ sau E}_p)}{\text{Turnover (Ca)}} \times T$ T – <i>management period</i> for which the analysis is made, expressed in the number of calendar days of the respective period (month, semester, term, year).
2. According to the patrimonial elements for which it is calculated:	a) <i>capital management rates</i> – are calculated for the liabilities patrimonial elements .
	b) <i>assets management rates</i> – characterize the rotation of the immobilized assets and of current assets.

The rotation speed analysis involves pursuing the following goals:

- measurement of rotation speed and identification of calculation elements;
- interpretation and meaning of change of rotation speed;
- identifying factors of influence and their interpretation;
- the effects of increasing the rotation speed.

Accelerating of the rotation speed, resulting in increasing the number of rotations or diminishing the duration of a rotation in the days, means: reducing the necessary resources to achieve a certain level of turnover, obtaining a higher turnover for consumption given by resources.

The *decreasing of the rotation speed* noticed by reducing the number of rotations or increasing the duration of a rotation in days and means: increasing the necessary resources to achieve a certain level of turnover, obtaining a lower level of turnover at total consumption given by the resources.

1. Indicators of the Rotation Speed of Assets and Liabilities

The main rates analyzed within this group are presented in the table no. 2:

Table no. 2 Categories of rates of rotation of assets and liabilities

a) The rotation speed of the asset	<ul style="list-style-type: none"> reflects the efficiency of using all the assets of the enterprise; calculate with the relations: $nr_{At} = \frac{CA}{At} \text{ or } dz_{At} = \frac{At}{CA} \times T$
b) The rotation speed of fixed assets	<ul style="list-style-type: none"> reflects the efficiency of the use of fixed assets; calculate with the relations: $nr_{Ai} = \frac{CA}{Ai} \text{ or } dz_{Ai} = \frac{Ai}{CA} \times T$ because, in the case of fixed assets, the main weight belongs to the tangible assets, it is possible to calculate the rotation speed of the tangible assets: $nr_{Ic} = \frac{CA}{Ic} \text{ or } dz_{Ic} = \frac{Ic}{CA} \times T$ the issue raised by this indicator is the value of the fixed assets to be used, gross or net; it is known that the mass of net assets is affected by the method of calculating the depreciation while the gross fixed assets represent historical elements and affect the actual value of the denominator. Because of these aspects, the pointer can be approached at two angles of view: <ul style="list-style-type: none"> <i>from a financial point of view</i>, net assets should be taken into account as the financial analyst will investigate and attempt to assess the return on funds at that time and that these funds are repeatedly recovered by calculating the depreciation; <i>from an economic point of view</i>, it is preferable for the denominator to include the amount of gross fixed assets.
c) The rotation speed of the circulating assets	<ul style="list-style-type: none"> expresses the number of rotations or the average duration of a turnover of the circulating assets by turnover. there are calculating the relations: $nr_{Ac} = \frac{CA}{Ac} \text{ or } dz_{Ac} = \frac{Ac}{CA} \times T$ accelerating the speed of rotation of circulating assets leads to releases of material resources necessary for the production process and thereby to reduce financial expenses and to increase the realized profit. circulating assets are formed of: <ul style="list-style-type: none"> Stocks (St) Receivables (Cr) Availability (Db) thus, $Ac = St + Cr + Db$, and in order to identify the directions of action for accelerating their rotation it is necessary to follow them separately.
d) The rate of rotation of equity	<ul style="list-style-type: none"> indicates how many times the enterprise has reused its own resources over a period of time; there are calculating with the relations: $nr_{CPR} = \frac{CA}{CPR} \text{ or } dz_{CPR} = \frac{CPR}{CA} \times T$
e) The rate of rotation of the permanent capital	<ul style="list-style-type: none"> provides information on the speed with which the enterprise has exploited the permanent resources it has at its disposal; there are calculating with the relations: $nr_{CPM} = \frac{CA}{CPM} \text{ or } dz_{CPM} = \frac{CPM}{CA} \times T$

	<ul style="list-style-type: none"> it is estimated that the minimum value that ensures an acceptable return on the permanent capital is two rotations per annum, i.e. an average return of capital in the form of available 180 days. [1, 110]
f) Speed of total debt rotation	<ul style="list-style-type: none"> shows the number of rebuilding of borrowed and attracted sources on the basis of turnover in a management period; there are calculating with the relations: $nr_{Dt} = \frac{CA}{Dt} \text{ or } dz_{Dt} = \frac{Dt}{CA} \times T .$
g) Credit –client rotation speed	<ul style="list-style-type: none"> there are calculating with the relations: $nr_{Cl} = \frac{CA}{Cl} \text{ or } dz_{Cl} = \frac{Cl}{CA} \times T$
h) Credit -supplier rotation speed	<ul style="list-style-type: none"> there are calculating with the relations: $n_r = \frac{Ca}{\text{Suppliers}}$ $d_z = \frac{\text{Suppliers}}{Ca} \times 360$

2. Inventory Rotation Speed Indicators

The speed of inventory rotation shows the speed at which inventories pass through the supply -manufacturing - sales phases, until they return to their original form of money.

The higher the rotation speed is, the greater the efficiency of inventory is, because the effects of using it are higher.

The main factors determining the size of stocks are found in [2, 122]:

- predicted sales level;
- the length of the manufacturing process;
- perishability of finished products;
- ease of supply or ease of stock replacement;
- the consequences of not insuring a certain type of raw material.

The speed of inventory rotation can be appreciated by the indicators [3, 108]:

- number of rotations: $n_r = \frac{Ca}{Sm}$;
- rotation duration in days: $d_z = \frac{Sm \times 360}{Ca}$.

Where, Sm = average inventory and it is determined like this: $Sm = \frac{Si + Sf}{2}$, where Si and Sf represents the existing inventory at the beginning of the period and respectively at the end of the period.

The calculation of the average annual balance of inventory may also be made in other ways also:

- if the half-year balances are taken into account (Sms) then the average annual balance has the relationship:

$$Sm = \frac{\sum Sms}{2} ;$$

- if average quarterly balances are taken into account (Smt), the average annual balance is obtained like this:

$$Sm = \frac{\sum Smt}{4} ;$$

- if average monthly balances are taken into account (Sml), the average annual balance has the following relationship:

$$Sm = \frac{\sum Sml}{12} .$$

An increase in average stock will result in a reduction in the number of rotations (or an increase in the number of days in a rotation) and a decrease in the average stock will result in an increase in the number of rotations (i.e. the reduction in the duration of a rotation in days).

Controlling inventory value and size is one of the keys to business success at this time. Basically, a company can not work without stocks, but at the same time, too many stocks can lead to a financial bottleneck by immobilizing the money they were bought with.

In the calculation and interpretation of stock turnover there are three issues that the financial manager should take into account:

- the turnover figure is expressed at market price, while inventories are taken into account at their book value (the value from the date they were purchased);
- **FIFO** - "first in, first out", **LIFO** - "last in, first out" can be used to evaluate stocks, which can lead to different interpretations ;
- when calculating the rate, annual sales are taken into account, while stocks are valued at a certain amount.

Taking into account that the average balance of current assets consists of the following elements:

- a. stock of raw materials and materials (Sma),
- b. production in progress (Smb),
- c. semi finished and finished products (Smc),

It is possible to calculate the duration of the rotation of the circulating assets as a sum of the rotation duration of each component.

So $dz = da + db + dc$, known as each of the three components has the following computation relation:

▪ The rotation time of stocks of raw materials and materials (da)	$da = \frac{Sma \times T}{M} \times \frac{M}{Pc} \times \frac{Pc}{C'a} \times \frac{C'a}{Ca}$
▪ The rotation time of the ongoing production (db)	$db = \frac{Smb \times T}{Pc} \times \frac{Pc}{C'a} \times \frac{C'a}{Ca}$
▪ The rotation time of semi-finished products and finished products (dc)	$dc = \frac{Smc \times T}{C'a} \times \frac{C'a}{Ca}$, where:
Sma – the average balance of stocks of raw materials and materials; Smb - the average balance of current production; Smc - the average balance of semi-finished products and finished products; M - material expenses; Pc - manufactured output expressed in cost; C'a - turnover in cost; Ca - the turnover expressed in price.	

This model highlights the contribution made by each stock component to the acceleration (slowing down) of the rotational speed on total circulating assets.

3. Credit-Customer Rotation Speed Indicators

Credit-customer rotation speed measures how many days the enterprise recovers the value of delivered products and / or customer service and is valued by the number of rotations and the duration of a rotation.

$$nr_{Cl} = \frac{CA}{Cl} \quad dz_{Cl} = \frac{Cl}{CA} \times T$$

where, Cl - represents total receivables and is equal to the sum of the customer account balance plus receivables plus maturity impacts.

The payday of client credit expresses the gap between the billing date and the invoice receipt date.

The size of this indicator can be influenced by:

- suppliers strategy;
- relationships with customers;
- production specificity;
- economic conjuncture;
- credit policy on the market.

The factors that determine the change in client-to-customer rotation speed are:

- Change in turnover;
- Change of customer receivables.

This indicator helps the financial manager to establish a working strategy with clients. As a measure against bad customers, the analysts recommend that the supplier company enter into the contract a clause providing for the penalties that the client will pay in the event of inaccurate invoices (*% per day of delay*). Also, the contract must provide for a time limit up to which the invoice can be paid, after which the provider can initiate debt recovery procedures, including by court order.

4. Credit-Supplier Rotation Speed Indicators

The rotation speed of suppliers shows how many days the enterprise pays its obligations to suppliers, by expressing:

- number of rotation of supplier credit:

$$n_r = \frac{Ca}{\text{Suppliers}} \text{ or } n_r = \frac{\text{Total Costs}}{\text{Suppliers}} \text{ or } n_r = \frac{\text{Total Supply}}{\text{Suppliers}}$$

- rotation duration in days:

$$d_z = \frac{\text{Suppliers} \times 360}{Ca} \text{ or } d_z = \frac{\text{Suppliers} \times 360}{\text{Total Costs}} \text{ or } d_z = \frac{\text{Suppliers} \times 360}{\text{Total Supply}}$$

The size of this indicator is influenced by:

- the position of the supplying undertaking on the market as compared to competitors;
- the specificity of the activity;
- the relationships established by the firm with the suppliers;
- economic conjuncture and credit policy on the market.

If the duration of the loan-supplier increases, this may mean a deterioration in the financial situation of the company that requires additional payment deadlines and even a reduction in the company's financial independence if the debt ratio to suppliers grows rapidly but may also mean that The undertaking is strong enough to impose certain conditions on the suppliers. [4, 179]

If the duration of the client loan is longer than the duration of the supplier loan, a financial resources deficit is created at the enterprise level.

If the duration of the supplier loan is longer than the length of the client loan, then a surplus of financial resources is created.

5. Case Studies

For example, the data from the balance sheet and the profit and loss account of SC ALFA SA are used.

Analysis of asset and liability ratios

The values recorded by these rates are presented in Table no. 3.

Table no. 3 Evolution of asset and liability ratios

Crt. no.	Specification	Symbol	U.M.	Analyzed period				
				2012	2013	2014	2015	2016
1.	Net fixed assets	Ai	lei	69.142.006	80.982.639	85.596.263	106.793.221	164.097.678
2.	Circulating assets	Ac	lei	104.751.871	108.154.522	126.224.475	153.843.727	181.193.103
3.	Total assets	At	lei	173.893.877	189.137.161	211.820.738	260.636.948	345.290.781
4.	Total liabilities	Dt	lei	66.796.832	62.921.606	56.230.464	71.209.926	88.088.591
5.	Own equity	Cpr	lei	107.097.045	126.215.555	155.590.274	189.427.022	257.202.190
6.	Turnover	CA	lei	121.495.052	136.028.515	163.497.747	195.677.945	229.415.602
7.	Number of rotation of	CA/At	-	0,70	0,72	0,77	0,75	0,66

Crt. no.	Specification	Symbol	U.M.	Analyzed period				
				2012	2013	2014	2015	2016
	the total assets							
8.	Total assets rotation duration	(At/CA)*360	days	515,26	500,55	466,40	479,51	541,83
9.	Rotation number for fixed assets	CA/Ai	-	1,76	1,68	1,91	1,83	1,40
10.	Rotation duration for fixed assets	(Ai/CA)*360	days	204,87	214,32	188,47	196,47	257,50
11.	Number of rotation of circulating assets	CA/Ac	-	1,16	1,26	1,30	1,27	1,27
12.	Rotation duration for circulating assets	(Ac/CA)*360	days	310,39	286,23	277,93	283,04	284,33
13.	Own equity rotation number	CA/Cpr	-	1,13	1,08	1,05	1,03	0,89
14.	Own equity rotation duration	(Cpr/CA)*360	days	317,34	334,03	342,59	348,50	403,60
15.	Total liabilities rotation number	CA/Dt	-	1,82	2,16	2,91	2,75	2,60
16.	Total liabilities rotation duration	(Dt/CA)*360	days	197,92	166,52	123,81	131,01	138,23

The asset and liability ratios recorded the following evolution:

- In the last year of the analysis, the assets turn by turnover 0.66 times, recovering in the form of initial money in 541.83 days, the average duration in days of a rotation increasing by 62.32 days compared to the previous year, which means the decrease of the efficiency of asset use, respectively the increase of the average duration of their recovery in the initial money form. For the whole period, the trend is to decrease the number of rotations, respectively to increase the average duration of a rotation.
- In the last three years of the analyzed period, there was a trend of decreasing the number of rotations of fixed assets and circulating assets by turnover, respectively an increase in the average duration of a rotation of fixed assets and current assets, which means Reducing the efficiency of the use of fixed and circulating assets, respectively increasing the average duration of their transformation into the initial money form.
- In 2016, own capital turnover is 0.89 times turnover, recovering as initial money in an average term of 403.6 days, the average duration of a turnover increasing by 55, compared to the previous year, 1 day, which means reducing the efficiency of using equity.
- In the first three years of the analysis, the trend which was manifested was the increase of the number of rotations, respectively the reduction of the average duration of debt settlement. Between 2015 and 2016, the average duration of a total debt rotation increased by 7.22 days, which means increasing the average business and financial lending time of the enterprise.

Analysis of inventory rotation speed

Inventory management is pursued using the management rate, expressed by two indicators:

- rotation number: $n_r = \frac{Ca}{Sm}$;
- duration in days of a rotation: $d_z = \frac{Sm \times 360}{Ca}$.

Table no. 4 Inventory rotation speed

Crt. no.	Specification	Symbol	UM	Analyzed period				
				2012	2013	2014	2015	2016
1.	Turnover	CA	lei	121.495.052	136.028.515	163.497.747	195.677.945	229.415.602
2.	Average inventory total	Sm	lei	22.140.526	22.959.677	23.002.323	20.279.463	20.043.473
3.	Number of rotations	no	rot	5,49	5,92	7,11	9,65	11,45
4.	Duration in days of a rotation	dz	days	65,60	60,76	50,65	37,31	31,45
5.	Increasing indicator of the CA	I _{CA}	%	100,00	111,96	120,19	119,68	117,24
6.	Increasing indicator of the St	I _{St}	%	100,00	103,70	100,19	88,16	98,84

In the last year of analysis it was noticed that stocks were rotating 11.45 times, going through the economic cycle and recovering as initial money by turnover in an average term of 31.45 days. The number of revolutions compared to the previous year increased by 1.8, and the average duration in days decreased by 5.86 days, which means an increase of the efficiency of stock utilization. The reason for this change is to increase the turnover rate higher than the stock growth rate.

Analyzing the rotation speed of the customer-credit and the supplier-credit

The customer -credit rotation speed is calculated by:

$$nr_{Cl} = \frac{CA}{Cl} \text{ or } dz_{Cl} = \frac{Cl}{CA} \times T, \text{ where:}$$

Cl – average clients;

CA – turnover.

This rate shows how many days the enterprise collects its customers, indicating the average gap in days between the date of invoicing and the date of receipt of the value of the goods sold. Reducing the credit - customer recovery period it means raising liquidity. The indicator is considered to be within normal range when the average duration is less than 45 days (8 rotations).

Table no. 6 Credit - customer rotation speed

Crt. no.	Specification	Symbol	UM	Analyzed period				
				2012	2013	2014	2015	2016
1.	Turnover	CA	lei	121.495.052	136.028.515	163.497.747	195.677.945	229.415.602
2.	Average clients	Cl	lei	77.103.231	79.244.324	88.233.153	100.121.308	113.076.647
3.	Number of rotations	nr	rot	1,58	1,72	1,85	1,95	2,03
4.	Duration in days of a rotation	dz	days	228,46	209,72	194,28	184,20	177,44
5.	Increasing indicator of the CA	I _{CA}	%	100,00	111,96	120,19	119,68	117,24
6.	Increasing indicator of the Cl	I _{Cl}	%	100,00	102,78	111,34	113,47	112,94

The rotation rate of the credit-supplier is calculated with the relationships:

$$n_r = \frac{Ca}{Suppliers} \text{ or } d_z = \frac{Suppliers}{Ca} \times 360$$

This rate shows how many days the enterprise pays its obligations to suppliers, indicating the average gap in days between the date of invoicing and the date of payment of the value of the purchased goods. Reducing the payment period of the supplier-credit means raising the degree of eligibility. The indicator is considered normal when the average duration is over 45 days (8 rotations).

Table no. 7 The rate of rotation of the supplier-credit

Crt. no.	Specification	Symbol	UM	Analyzed period				
				2012	2013	2014	2015	2016
1.	Turnover	CA	lei	121.495.052	136.028.515	163.497.747	195.677.945	229.415.602
2.	Average suppliers	Fz	lei	18.814.178	21.002.423	20.580.057	17.714.323	20.592.476
3.	Number of rotations	nr	rot	6,46	6,48	7,94	11,05	11,14
4.	Duration in days of a rotation	dz	zile	55,75	55,58	45,31	32,59	32,31
5.	Increasing indicator of the CA	I _{CA}	%	100,00	111,96	120,19	119,68	117,24
6.	Increasing indicator of the Fz	I _{Fz}	%	100,00	111,63	97,99	86,08	116,25

Table no. 8 Comparison of credit - customer rotation speed to the rotation speed of the credit-supplier

Crt. no.	Specification	Symbol	UM	Analyzed period				
				2012	2013	2014	2015	2016
1.	Number of rotations clients	no	rot	1,58	1,72	1,85	1,95	2,03
2.	Duration in days of a rotation of clients	dz	days	228,46	209,72	194,28	184,20	177,44
3.	Number of rotations - suppliers	no	rot	6,46	6,48	7,94	11,05	11,14
4.	Duration in days of a rotation of suppliers	dz	days	55,75	55,58	45,31	32,59	32,31

Conclusions

Of particular importance for management is the correlation between the length of customer collection and the payout time of the suppliers. Throughout the analyzed period, the duration of customer rotation is higher than the duration of the rotation of the suppliers, an unfavourable situation for the enterprise, which means a shortage of financial resources. This discrepancy between receipts and payments is unfavourable to the firm's business, leading to a decrease in the treasury.

In order to overcome these shortcomings, the following measures are required:

- Reducing as far as possible the length of the manufacturing cycle through a better organization of the supply and production activity that leads to the elimination of delays in the manufacturing process;
- Concluding contracts with suppliers willing to accept broader payment terms;
- Reducing payment deadlines for external customers and take firm steps to recover debts at the expected payment deadlines.

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