THE USE OF THE DYNAMIC FLOW SERIES IN THE ANALYSIS OF THE ECONOMIC-FINANCIAL PERFORMANCE OF A TRADING COMPANY

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Abstract

The economic-financial performance of a trading company depends on the realization of real growth programs, the assurance of some correlations between them, as well as the interpretation of these correlations. In the case of the present article, the authors set out to analyze through the dynamic series of flows, how a commercial company evolves economically. The data for such concrete analyzes are taken from the balance sheets of the commercial companies, being able to determine a series of parameters, which will reflect how these results of the company evolve.

The chronological series generally presents a series of indicators with large variations from one period of time to another and therefore the evolution mode can be highlighted only by processing the data presented as data series over a longer period to be edifying and using dynamic chronological series.

The calculation methodology must ensure the expression of the variation in time, based on an analytical function of time, which has been substantiated and expressed accordingly. This analysis must be carried out in the most precise way by using dynamic series of turnover, their modification, growth rate, and calculations will be made based on chronological indicators, which are expressed and calculated as fixed-base indicators or indicators chain-based. From the dynamics indications that have resulted and from their interpretation one can draw the necessary conclusions. In this sense, the indicators used in absolute or relative size, expressed and suggested the degree of profitability of the business activity in question.

We have taken data series as wide as possible for the calculated parameters to be representative, and the eventual or necessary, rather, forecast of the evolution of the company and based on its profitability, may increase in the next period or on the contrary may be blocked. The article and the study

carried out are based on concrete data taken from a representative trading company, mentioned in the article.

Keywords: indicators, dynamic series, variation, fixed and chain basis, absolute and relative size.

JEL Classification: C10, E22

Introduction

In this article, regarding the analysis of the economic-financial performance of a trading company using dynamic evenings of flows, we started from the need to know how a trading company evolved over a period of time, to identify the future evolution modalities. and consequently, we can ensure through the measures taken an increase in the value of the turnover, subordinated to the improvement of the profitability of the company.

The article first presents aspects regarding the dynamic series of flows, also highlighting the time function that can be used, depending on the values of the variables used and the values of the time variable, identifying the indicators with fixed base and chain based, which are usable within this desire of anyone to increase the profitability of a trading company.

We used the relative sizes that refer to two aspects, when they represent variations with respect to the level of the base period by comparison, or by reference to the previous period, from which the indicators used, respectively indexes with fixed base and indexes based on chain.

The calculations performed and presented revealed the way in which the main aspects that characterize the financial situation of a trading company evolve, context in which the manager of the trading company can determine precisely how to act in order to ensure a profitability increase.

We did not focus on presenting actual calculations, as we consider the situation of the trading company at one point, and the resulting indicators were presented in the synthetic tables, in particular the turnover and the effect on the profitability. Based on these, the data was interpreted and analyzed, which led to theoretical and practical conclusions, suggesting that using absolute and relative indicators together, there are wider possibilities to interpret the recorded turnover and the economic growth or decrease depending on the mode is observed. in which the resources available to the trading company (financial, labor and capital) are available.

Literature review

Anghel (2015) presented a set of economic-financial indicators used in the analysis of the company. Anghel (2014) conducted a study on the results of the company, based on the financial statements. Anghelache, Grigorescu

and Bîrsan (2019) analyzed a number of fundamental elements regarding the nature of dynamic models. Anghelache (2008) analyzed the main statistical indicators applied in economic studies. Anghelache, Mitruţ and Voineagu (2008) highlighted the role of chronological series in stochastic processes. Iacob (2019) analyzed the statistical-econometric instrumentation in economic studies. Iacob (2019) carried out a spectral analysis of the profit of the construction materials distribution companies in Romania. Boshnakov and Iqelan (2009) and Reis (2009) addressed a number of issues related to dynamic series analysis. Pesavento and Rossi (2006) investigated aspects of confidence intervals.

Research methodology, data, results and discussions

The chronological series, show indicators with large variations from time to time. The mode of evolution of the economic phenomena can be highlighted by the processing of data according to time. Therefore, some dynamic chronological series, consisting of different types of indicators, can be statistically processed.

Also, for a series of moments and for a series of intervals, the calculations of a system of indicators are performed differentially.

The calculation methodology must ensure the continuity of the time variation, being an analytical function of time that can be reproduced by the relation:

$$y_i = f(t_i) \tag{1}$$

where: $\begin{cases} y_i = \text{the values of the studied variable;} \\ t_i = \text{the numerical values of the time variable.} \end{cases}$

The data regarding the evolution of the turnover of a trading company, over a period of twenty-four quarters, are structured in the following table.

Situation regarding the turnover realized during the period Trim I 2013-Trim IV 2018

Table 1

Period	QI 2013	Q II 2013	QIII 2013	QIV 2013	Q I 2014	Q II 2014	Q III2014	QIV 2014	Q I 2015	Q II 2015	Q III2015
Turnover (Ron)	7981235	8523648	9042738	9569813	9862278	10442412	10864286	11436068	12167137	13076829	14971662

Q I V2015	Q I 2016	Q II 2016	Q III 2016	Q IV 2016	Q I 2017	Q II 2017	Q III 2017	Q IV 2017	Q I 2018	Q II 2018	Q III 2018	Q IV 2018
15753204	16241993	17345817	18402178	19474782	20121805	20955326	22231506	23027309	23558884	24025397	24508307	24970016

The absolute increase or decrease can be calculated from the level of a single period, considered the reference base, in which case a fixed base index is obtained. From one reference base to another reference base, indexes based

on the chain are obtained, considered as an absolute increase or decrease with a variable basis.

Fixed-base and chain-based gains, which are calculated as the difference between the level of each period and the level of the reference period, are determined according to the relationships:

• Fixed base gain:

$$\Delta_{i/0} = y_i - y_0 \quad (2)$$

• Chain-based gain:

$$\Delta_{i/i-0} = y_i - y_{i-1} \quad (3)$$

Situation regarding the dynamics of the turnover realized during the period 2013-2018

Table 2

Years	Turnover (RON)	Absolute changes with		Dynamic indices with		Growth rate with	
		fixed base	chain base	fixed base	chain base	fixed base	chain base
	y	$\Delta_{i/0}$	$\Delta_{i/0-1}$	$I_{i/0}$	$I_{i/0-1}$	$R_{i/0}$	$R_{i/0-1}$
A	01	02	03	04	05	06	07
Q I 2013	7981235			100			
Q II 2013	8523648	542413	542413	106.80	106.80	6.80	6.80
Q III 2013	9042738	1061503	519090	113.30	106.09	13.30	6.09
Q IV2013	9569813	1588578	527075	119.90	105.83	19.90	5.83
Q I 2014	9862278	1881043	292465	123.57	103.06	23.57	3.06
Q II 2014	10442412	2461177	580134	130.84	105.88	30.84	5.88
Q III 2014	10864286	2883051	421874	136.12	104.04	36.12	4.04
Q IV2014	11436068	3454833	571782	143.29	105.26	43.29	5.26
Q I 2015	12167137	4185902	731069	152.45	106.39	52.45	6.39
Q II 2015	13076829	5095594	909692	163.84	107.48	63.84	7.48
Q III 2015	14971662	6990427	1894833	187.59	114.49	87.59	14.49
Q IV2015	15753204	7771969	781542	197.38	105.22	97.38	5.22
Q I 2016	16241993	8260758	488789	203.50	103.10	103.50	3.10
Q II 2016	17345817	9364582	1103824	217.33	106.80	117.33	6.80
Q III 2016	18402178	10420943	1056361	230.57	106.09	130.57	6.09
Q IV2016	19474782	11493547	1072604	244.01	105.83	144.01	5.83
Q I 2017	20121805	12140570	647023	252.11	103.32	152.11	3.32
Q II 2017	20955326	12974091	833521	262.56	104.14	162.56	4.14
Q III 2017	22231506	14250271	1276180	278.55	106.09	178.55	6.09
Q IV2017	23027309	15046074	795803	288.52	103.58	188.52	3.58
Q I 2018	23558884	15577649	531575	295.18	102.31	195.18	2.31
Q II 2018	24025397	16044162	466513	301.02	101.98	201.02	1.98
Q III 2018	24508307	16527072	482910	307.07	102.01	207.07	2.01
Q IV2018	24970016	16988781	461709	312.86	101.88	212.86	1.88
	$\sum_{i=0}^{24} y_i$		$\sum_{i=1}^{24} \Delta_{i/i-1}$		$\prod_{i=1}^{24} I_{i/i-1}$		

$$\sum_{i=1}^{n} \Delta_{i/i-1} = \Delta_{n/0} \quad (4)$$

Which means that:

$$(y_1 - y_0) + (y_2 - y_1) + \ldots + (y_n - y_{n-1}) = y_n - y_0 \quad (5)$$

$$\sum_{i=1}^{n} \Delta_{i/i-1} = \Delta_{n/0}$$

These indicators are widely used in macroeconomic analyzes in order to establish correlations and proportions between different branches of the national economy or between different economic sectors.

The relative sizes can refer to two aspects: when the level of a period shows variations with respect to the level of the period chosen as the basis of comparison or to find the change of the level of a phenomenon from the reported period to the reporting period.

The relative size or the dynamic index shows the change in time of a phenomenon and is calculated with both a fixed and a chain basis.

Dynamics index with a fixed basis calculated as a ratio between the level of the period for which it is calculated and the level of the period chosen as the basis:

$$I_{i/0} = \frac{y_i}{y_0} * 100 \quad (7)$$

Growth index based on the chain ($I_{i/i-1}$) calculated as a ratio between the level of the period for which it is calculated and the level of the period chosen as the basis:

$$I_{i/i-1} = \frac{y_i}{y_{i-1}} * 100 \quad (8)$$

A chronological series will get as many fixed-base indexes as we have terms, and one less in the case of chain-based indexes. Between the indices there are relations that allow the transition from one form to another. If we make the product of growth indices based on the chain we obtain the growth index with fixed base for the whole period, as shown in the relation:

$$\prod_{i=1}^{n} I_{i/i} = I_{n/o} \quad (9)$$

where: $I_{1/0} * I_{2/1} * I_{3/2} \ldots I_{n/n-1} = I_{n/o}$ (10)

If we report a fixed-base dynamics index for the current period to the fixed-base index of the previous period, we obtain the corresponding chain-based index, as in the formula:

$$\frac{I_{i/o}}{I_{i-1/o}} = \frac{y_i}{y_o} : \frac{y_{i-1}}{y_o} = \frac{y_i}{y_{i-1}} \quad (11)$$

Otherwise expressed:

$$\frac{I_{i/o}}{I_{i-1/o}} = I_{i/i-1} \quad (12)$$

The rate of development, the rate of the increase, or the rate of growth with a fixed base or with a chain base is calculated to establish the increase of the level compared to the level taken as a reference base:
The growth rate with a fixed base can be reproduced through the relationships:

$$R_{i/0} = \frac{y_i - y_0}{y_0} * 100 \quad (13)$$

The rate of development shows the relative increase achieved each year compared to the base period.

The growth rate based on the chain, expressed in percentages, is calculated as a ratio between the growth of the chain of each year and the level of the previous year as follows:

$$R_{i/i} = \frac{y_i - y_{i-1}}{y_{i-1}} * 100 \quad (14)$$

The transition from a growth rate with a fixed base to a chain based growth is achieved only by transforming them into corresponding dynamics indices.

$$I_{i/0} = (R_{i/0} + 1) * 100 \quad (15)$$

$$I_{i/i-1} = (R_{i/i-1} + 1) * 100 \quad (16)$$

Because the product of growth rate indexes based on the chain is not equal to the index of fixed rate growth of the whole period:

$$\prod_{i=1}^{n} R_{i/i-1} \neq R_{n/o} \quad (17)$$

Using the relationships from one base to another, growth indices or growth rates can lead to obtaining indices that we do not know. If the growth rates based on the chain are known we can calculate other indicators with fixed or mobile base.

Chain based indicators:

$$I_{\frac{i}{i}-1}(\%) = \left(R_{\frac{i}{i}} - 1\right) + 100 \quad (18)$$

Fixed-base indicators:

$$\prod_{i=1}^{n} I_{i/i-1} = I_{n/o} \quad (19)$$

Fixed growth rate:

$$I_{i/0}\% - 100 = R_{\frac{i}{o}}\% \quad (20)$$

Transition from growth rates to dynamic bases with mobile bases to rhythms and fixed base indices

Table 3

Known data		Date calculate		
Years	Rhythm from the previous year (%)	Indexes based on the chain	Indices with fixed base	Rhythm with fixed base
0	1	2	3	4
Q I 2013				
Q II 2013	6.80	106.80	106.80	6.80
Q III 2013	6.09	106.09	113.30	13.30
Q IV2013	5.83	105.83	119.90	19.90
Q I 2014	3.06	103.06	123.57	23.57
Q II 2014	5.88	105.88	130.84	30.84
Q III 2014	4.04	104.04	136.12	36.12
Q IV2014	5.26	105.26	143.29	43.29
Q I 2015	6.39	106.39	152.45	52.45
Q II 2015	7.48	107.48	163.84	63.84
Q III 2015	14.49	114.49	187.59	87.59
Q IV2015	5.22	105.22	197.38	97.38
Q I 2016	3.10	103.10	203.50	103.50
Q II 2016	6.80	106.80	217.33	117.33
Q III 2016	6.09	106.09	230.57	130.57
Q IV2016	5.83	105.83	244.01	144.01
Q I 2017	3.32	103.32	252.11	152.11
Q II 2017	4.14	104.14	262.56	162.56
Q III 2017	6.09	106.09	278.55	178.55
Q IV2017	3.58	103.58	288.52	188.52
Q I 2018	2.31	102.31	295.18	195.18
Q II 2018	1.98	101.98	301.02	201.02
Q III 2018	2.01	102.01	307.07	207.07

Using the absolute and relative indicators together, conclusions can be drawn regarding the turnover of our company during the analyzed period, a sustained growth of approximately three times in 2018 compared to 2013. For indexes based on the chain there is an increase until 2015, after which, after this date, this index will register a significant decrease. Regarding fixed-base indexes and fixed-base rhythms, we observe a steady increase from one period to another.

It should be known, however, that due to their variable base, chain-based indices versus fixed-base indices, they cannot be compared directly. In

order to highlight the tendency of development of the analyzed phenomenon, it is recommended to calculate an intermediate indicator which is the absolute value of a percentage of growth with a fixed base and with a chain base.

The absolute value of the percentages of growth with a fixed base is the same for the whole period, because the level that was considered 100% equal is the level of the base year (y_0) and expresses how many units, of the increase registered in a year, return to each percentage of the rhythm gain.

By comparing the absolute increase to the relative gain obtained for the same period by referring to the same basis we will have the absolute value of the percentage increase with a fixed base.

If the absolute value of a growth percentage with a fixed base is noted with $A_{i/0}$, then they can be played with the relation:

$$A_{i/0} = \frac{\Delta_{i/0}}{(R_{i/0})100} \tag{21}$$

It is found that, each time, the absolute value corresponding to a percentage of growth with a fixed base can be calculated by making the ratio between the base period level and 100 as in the formulas below:

$$A_{i/0} = \frac{\Delta_{i/0}}{R_{i/0}\%} = \frac{y_i - y_0}{\frac{y_i - y_0}{y_0} * 100} = \frac{y_0}{100} \tag{22}$$

$$A_{i/0} = \frac{y_0}{100} \tag{23}$$

Between these indices there is compatibility being able to carry out operations of addition and subtraction. The absolute value of a growth percentage based on the chain will be determined using the same reasoning according to the following relation:

$$A_{i/i-1} = \frac{\Delta_{i/i-1}}{(R_{i/i-1})100} \tag{24}$$

The absolute size can also be calculated as one hundred percent of the growth of the previous period through the relationships below:

$$A_{i/i} = \frac{\Delta_{i/i-1}}{R_{i/i-1/0}\%} = \frac{y_i - y_{i-1}}{\frac{y_i - y_{i-1}}{y_{i-1}} * 100} = \frac{y_{i-1}}{100} \tag{25}$$

$$A_{i/i-1} = \frac{y_{i-1}}{100} \tag{26}$$

This indicator links absolute indicators with relative indicators, supporting their correct interpretation.

Conclusions

From the analysis that underlies the indicator regarding the analysis of the economic-financial performance of a trading company based on the dynamic series of flows, a number of theoretical, but also practical, conclusions are drawn. The dynamic series of flows, ensures the possibility of carrying out another analysis based on the evolution until now of the trading company, the profitability obtained, the use of the resources available and based on these indicators that have resulted can be improved for the next period.

From this point of view, it has been pointed out that at the level of microeconomic analysis, dynamic flow systems are particularly useful, in that they provide a possibility to interpret the results obtained in each time period and from here and the perspective of future evolution, of course in the context in which material resources and all other aspects are actually used financially, so that growth is ensured. Of course, the basic indicator I mentioned in this analysis was the turnover achieved by the trading company over a period of time.

Another conclusion is that in the activity of a trading company with a more complex object of activity, there are possibilities of seasonal influence depending on certain products or services that are realized or provided. From this point of view, using the chronological averages and the indexes calculated on a fixed basis and on a chain basis, we were able to clear some aspects that were the basis for interpreting the evolution and finally the profitability achieved by the considered trading company.

Through the theoretical analysis, interpreted at the level of a trading company, we offered the possibility to understand the utility of using the dynamic series of flows, in any national, multinational trading company, at the level of the national economy, at the level of the sectors of the activity sectors. Of course, the analysis carried out can be extended to more, using other statistical-econometric models to ensure a more coherent interpretation and analysis on the forecasts of the evolution of the profitability of the trading company. Of course, speaking of profitability, we have in mind the way in which the performances of the trading company are ensured and consequently through the calculated parameters, we can identify the measures to be taken..

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