

Mathematical and Economic Modeling of the Results of Correlation Between Indicators of Profitability and Asset Management

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Abstract: Activity companies, regardless of sector, aims to both keep a favorable position in the market and creating financial resources to respond favorably people interact undertaking. These considerations are actually provided by the existence and sustainability of any business activity. Through this paper we follow not only the level of profitability of businesses related to food industry sector in Dolj, Romania, but also the correlation between the indicators of profitability and management of assets. The period of analysis is given by the range of 2012 - 2013, and of data analysis in terms of economic and mathematical being done using SPSS statistical and mathematical software.

Keywords: rentability, administration, assets, corelation, regression

JEL Classification: G00, G29, G23

1. Introduction

The main objective of enterprises, regardless of their activity or where they operate, is to occupy a position "comfortable" in the market. This "comfort" is defined, on the one hand, by financial gain which the company obtained by activity and, on the other hand the market share that it takes and develop and maintain or de- over time.

Financial return of an undertaking can be expressed in many ways, the indicators by which it is passed on to the company being called indicators of profitability, which is derived from its accounting and financial documents.

As profitability indicator used herein have the return on assets. This indicator reflects how the company has worked but in general.

Favorable outcome of a business activity resulting from the use of, first, in a most efficient transfer of material, financial, human, of which the company has. The indicators reflect the benefit obtained from the use of assets of an undertaking called management indicators.

The paper aims to achieve several objectives. On the one hand illustrate the level of profitability in the companies related to the food industry for the period Dolj County 2012 - 2013, on the other ways in which these enterprises were managed assets over this period and the existing correlation between indicators profitability and management of assets.

The results thus obtained are processed in terms of economic and mathematical affording a regression model.

To achieve the goals associated with their work and have been through several steps such as: defining the concepts encountered, establishing a research methodology and the tools and methods used for the application of this methodology and implementation of research methodology through a case study in the companies from Dolj county.

The paper concludes with key findings obtained detachment from the application of research methodology on firms studied and views on improving relations with existing economic profitability couple - active management.

2. Concepts and terms used

Profitability is first seen in concept work structure, which is still mentioned in title.

Not infrequently the state of profitability was confused state of profitability of the economic entity.

If we refer to the two systems: the Anglo-Saxon and French, we see clearly different approach to the concept of return. Anglo-Saxon system does not distinguish between profitability and profit when the French system is even indignant of confusing the two terms. Thus, the profitability of specific French system expresses "a company's ability to generate earnings"¹ while profit expresses "it self of Enterprise's gain"².

Another definition of return is given by the authors Vasile Robu and Nicholas Georgescu which is "the ability of an enterprise to gain profit by using inputs and capital regardless of its origin"³.

Profitability is defined and reflected in an undertaking through absolute and relative indicators.

In this paper return is reflected both by absolute and relative indicators.

Absolute indicators are indicators expressing the results obtained from the work of an enterprise, and relative indicators are constructed respecting the expression efficiency ie the ratio between the effect and the effort to obtain it. Efficiency expresses how assets are used in general, and not only to the business of the undertaking.

Related term efficiency Lala and co-author I. our attention on several aspects, namely: "the company's profitability depends on the activity (volume and quality of supply, low unit cost, the Performance marketing, performance management, etc.) as and exogenous factors unrelated company (market price level formats, volume and dynamics cererii, sumer preferences, intensity of competition, etc.)"⁴.

To measure efficiency of an enterprise assets are generally used indicators such as asset turnover rate, the time duration of a rotation, or any indicator reflecting the earnings of the enterprise through the use of the asset.

Absolute indicators used to analyze the correlation between profitability, asset management and operating risk are: operating profit; gross profit; EBITDA.

The operating profit is the result that the enterprise obtains the work which it carries and determined as the difference between revenue and expenditure.

Gross profit is the result of all the three types of activities (operational, financial and extraordinary) and can be determined as the difference between total revenue and total expenditure, or as a sum of the three results for the three types of activities.

¹ Erich Helfferth, Tehnici de analiză

² P. Brezeanu, Diagnostic financiar: Instrumente de analiza financiară, Editura Economică, București, 2003, pag. 154

³ V. Robu, N. Georgescu, Analiza economico-financiară, Ed. Omnia Uni, Brașov, 2000, pag. 190

⁴ I. Lala-Popa, M.E. Miculeac, Analiză economico-financiară. Elemente teoretice și studii de caz. Ed. Mirton, Timișoara, 2009, pag. 120 (citându-l pe N. Dobrotă), preluat de la Mirela Ganea, Modelarea performanței economico-financiare a firmei, Ed. Universitaria, Craiova, 2012, pag. 95

EBITDA (Earning Before interest, taxes, depreciation and Amortization) is determined by deducting from total revenues operating expenses, depreciation expense and provisions.

Among the indicators of profitability which we will use in this paper is the return on assets.

Based on the relationship of economic rate of return calculation presented by Sergio M Jimenez Cardoso et namely ⁵:

$$Re = \frac{Pe}{At} \times 100$$

was developed relationship that highlights the link between economic rate of return of assets indicators and administration:

$$Re = \frac{Pe}{At} \times 100 = \frac{CA}{Ac} \times \frac{Pe}{CA} \times \frac{Ce}{Pe} \times \frac{Ve}{Ce} \times \frac{CA}{Ve} \times \frac{Ac}{CA} \times \frac{Pe}{Ac} \times \frac{Ac}{At}$$

where: Pe - operating profit;

At - total assets;

CA – turnover;

Ac - current assets;

Ve - operating income;

Ce - operating expenses;

$\frac{CA}{Ac}$ - Rotational speed of current assets expressed in terms of turnover;

$\frac{CA}{Ac}$ - During one rotation;

$\frac{CA}{Ve}$ - Operating income to operating expenses 1 leu;

$\frac{Ce}{Pe}$ - Operating expenses 1 leu from operations (indicator of efficiency of expenditures);

$\frac{Pe}{CA}$ - The rate of return on sales;

$\frac{CA}{Ve}$ - The share of turnover in operating income.

There is thus obtained factor analysis in the model system using du Pont a series of indicators that reflect how enterprise asset management, these indicators are a direct influence on the rate of economic profitability of the asset.

3. Methodology and research objectives

The paper is based tracking several main objectives, namely: the reflection level of profitability for companies in Dolj county for food industry, reflecting how asset management, correlation analysis and economic-mathematical modeling of existing correlation.

The first step to getting the equation was to analyze the correlation between the indicators of profitability and reflects an enterprise asset management we used SPSS. Correlation analysis was performed using Pearson index, number of firms being considered for 58 analyzed period ranging between 2012-2013.

⁵ Sergio M. Jimenez Cardoso, Manuel Garcia-Ayuso Covarsi, Guillermo J. Sierra Molina, Analisis Financiero, 2^a edicion, Ed. Piramides, Madrid, 2002, 219

Getting regression model involves several steps among which the most important are: analysis of intensity correlation between exogenous and endogenous variables, the model summary determination seeking materiality level R and R^2 , achievement test and ANOVA F , as and obtaining the final value of the coefficients of the regression model.

Processing data prior financial accounting used for the analysis of indicators and their economic-mathematical modeling was performed using the computer program Excel.

The data used to perform the analysis are shown in Annex 1 of the research paper, the indicators used are also reflected in this Annex.

4. Case study

Analysis of correlation between certain micro and macroeconomic indicators is one way that is emphasized that there are links between these indicators and how they influence. Also correlation analysis is a first step towards a mathematical economic model, intensity of the relationship between these indicators which justifies the importance of its creation.

As work methodology, we processed the management and profitability indicators using Excel's importing spreadsheet then SPSS related statistical analyzes required to achieve.

The number of variables are taken into account 58 variables analyzed period is 2012-2013.

Level determined using SPSS correlation between economic rate of return indicator and indicators of asset management is reflected in the following table:

Table 1 - Analysis of the correlation between economic profitability indicators of asset management

	Re	CA/Ac	Pe/CA	Ce/Pe	Ve/Ce	CA/Ve	Ac/CA	Pe/Ac	Ac/At
Re	1,000	-,172	,253	-,024	,148	-,054	,144	,698	,063
CA/Ac	-,172	1,000	,012	,222	-,012	-,044	-,111	-,053	-,443
Pe/CA	,253	,012	1,000	,005	,774	-,158	,193	,371	-,156
Ce/Pe	-,024	,222	,005	1,000	,027	,177	,163	,007	-,241
Ve/Ce	,148	-,012	,774	,027	1,000	-,085	,202	,184	-,181
CA/Ve	-,054	-,044	-,158	,177	-,085	1,000	,110	-,083	,029
Ac/CA	,144	-,111	,193	,163	,202	,110	1,000	,120	,022
Pe/Ac	,698	-,053	,371	,007	,184	-,083	,120	1,000	,277
Ac/At	,063	-,443	-,156	-,241	-,181	,029	,022	,277	1,000

Source: Table obtained by using statistical program SPSS

There is therefore, from the data reflected in the table above that the economic rate of return between indicators of asset management correlation, according to the

analysis model obtained by using du Pont System is one insignificant in most cases having a level of coefficient Low correlation.

In this case the regression model would not have an impact as representative of the studied but nevertheless I continued this analysis directing me toward modeling.

The first model obtained as a result of the regression equation is model summary, which is given in the table below:

Table 2 – Model Summary

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,751 ^a	,564	,493	9,82270170320 8990E0

a. Predictors: (Constant), Ac/At, Ac/CA, CA/Ve, Ve/Ce, Ce/Pe, Pe/Ac, CA/Ac, Pe/CA

b. Dependent Variable: Re

In this model there is a representative value to the materiality R and R², but what lowers the significance of the model is the standard error that has values over materiality.

Another test required to achieve linear regression model ANOVA. Within its value not only get the equation but also get the coefficient F. The coefficient is bigger interdependence of the analyzed indicators is higher.

The ANOVA model is thus reflected in the following table:

Table 3 – Test ANOVA

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6114,951	8	764,369	7,922	,000 ^a
	Residual	4727,788	49	96,485		
	Total	10842,739	57			

a. Predictors: (Constant), Ac/At, Ac/CA, CA/Ve, Ve/Ce, Ce/Pe, Pe/Ac, CA/Ac, Pe/CA

b. Dependent Variable: Re

Source: Table obtained by using statistical program SPSS

From the point of view we can say that according to the values obtained coefficient F, the regression model is not representative of the value of this coefficient being one low. Also according to this model there is a very high residual value of the 57 variable 49 were residual values.

So considering the results obtained from the food industry in Dolj county we can say that during the 2012 - 2013 level of correlation between the return on assets and indicators of asset management is insignificant, Pearson index showing this in the analyzes.

The regression model has proven to be representative in terms of materiality thresholds R and R² but according to ANOVA, exactly according to the ANOVA F test, there was a decrease of materiality, plus the residual values are a number very high in all the variables analyzed.

5. Conclusions

Mathematical and economic modeling correlation between the return on assets management indicators in the food industry in Dolj County, decreases the significance and interest, the results are the mathematical and statistical analysis that confirms this.

There is a renatibilității decrease from one year to another in the food industry decline reflected both the economic rate of return management and by indicators.

Although correlations were insignificant in amount, they were established in most cases as the direct, except speed indicator rotație assets and operating expenses to operating income 1 leu.

Given the correlations we can say that the regression model decreases as meaning the indicators analyzed, tests performed using SPSS community to shape economic and mathematical correlation proving these issues.

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