

A STUDY ON THE RETURN ON EQUITY FOR THE ROMANIAN INDUSTRIAL COMPANIES

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Abstract: In this paper, a study on a sample of 73 Romanian companies operating in industries was conducted. The survey covered the year 2008 and was based on data extracted from annual financial statements of the companies from the sample. Starting from a number of representative papers in the field, there were identified the influence factors of the return on equity and the quantifiable ones were hold, respectively the operating profit margin, the asset turnover and the financial leverage. These financial rates, together with the return on equity, have been determined for the entire population of enterprises from the sample. Subsequently was tested the statistical correlation between the level of influence factors and the return on equity. The results obtained partially confirmed the hypotheses set when starting the research, but have also denied some of them.

JEL classification: G30, G32

Key words: return on equity, net profit, equity, operating profit margin, asset turnover, financial leverage

1. INTRODUCTION

The return on equity is one of the main indicators that a company annually publishes. Along with the turnover, EBITDA and the operating margin, it is the basis of the annual financial reports, presenting a great importance for the stakeholders of the company.

The return on equity points out the efficiency of using the own capital of the company; that's why its level is important primarily for shareholders, who may thus determine whether the remuneration they get rewards the risk assumed. Managers, in turn, will be motivated to achieve an appropriate level of this rate so as to maintain their positions and to achieve the company's performance criteria.

The return on equity points out the remuneration of the shareholders, by the payment of dividends or by other forms of remuneration. For this reason, this ratio expresses the degree to which the managers have succeed to meet the company's main

objective, i.e. maximizing the wealth of its shareholders. In these circumstances, it may be stated that the efforts of the enterprise should be primarily targeted to ensure high returns for equity providers (shareholders), in order to increase their wealth.

The analysis of the return on equity (ROE) is necessary for many considerations [1]:

The indicator shows the degree of allocating the funds of shareholders in the current business and the efficiency of using these capitals in the business;

The indicator reflects the return of shareholders' capital, representing a measure of the company's capacity to remunerate the shareholders.

In the internal analysis, many companies use a variety of systems of indicators and standards, which divides into components the impact of decisions affecting the operational performance, the total revenues or the shareholders' expectations [Helfert]. From the mathematical point of view, this segmentation can be performed using the DuPont method, which can highlight the link between different factors of influence and the level of a rate of return. Based on the models that can be developed using the DuPont method, we can distinguish the ways to increase the company's financial performance, by piloting the influence factors identified.

Regarding ROE, the DuPont method leads to the following factorial model:

$$ROE = \frac{TA}{E} \times \frac{T}{TA} \times \frac{NP}{T},$$

where:

TA – total assets;

E – equity;

T – turnover;

NP – net profit;

$\frac{TA}{E}$

- the equity multiplier;

$\frac{T}{TA}$

- the total assets turnover;

$\frac{NI}{T}$

- the return on sales.

The equity multiplier shows the degree the equity finances the total assets. Indirectly, this rate points out the degree of financial independence or the financial leverage. An increase in the multiplier means that a greater percentage of total assets is financed by debts, i.e. an increase in indebtedness. Increased borrowing (reflected by increased multiplier) is not a problem for the firm, as long as the loans are used effectively and the leverage is kept within reasonable limits.

The total assets turnover influences ROE, reflecting the way the company manages its assets. A fast turnover means the possibility of achieving a higher return on equity, using a lower volume of fixed assets and current assets.

The return on sales reflects the profit margin of the business. The level of this rate depends on the marketing strategy adopted by the enterprise, but also on the specific features of the activity branch. In some industries, it is not possible to adopt a flexible pricing policy in order to increase profitability (by changing the profit margins) due to the reduced elasticity of demand to price changes [6].

Obviously, the ways to increase ROE are the three factors above. An increase of indebtedness results in an increase in ROE. However, in this regard, it should be taken into account the relationship (correlation) between the indebtedness and the return on sales. If the return on assets exceeds the cost of borrowed capital, it will produce a positive effect of financial leverage and ROE will increase. Otherwise, however (negative effect of financial leverage), the growth of borrowing, even if it has a positive direct impact on ROE, will be counterbalanced by a negative influence of the return on sales, due to a lower net profit.

In financial analysis, this model can be used to highlight the ways to improve the return on equity, but also to test the sensitivity of the return when changing the three influence factors. An analytical explanation of how the three factors influence the return on equity was provided by Helfert [3]. He divided the factors of influence into three categories of activities:

- Operational activity;
- Investment activity;
- Financing activity.

The operational activity influences ROE through the operating profit margin. The latter one is influenced, in turn, by the revenue management and the cost management. The revenue management is subject to price conditions, the actions of competitors and the market potential. The cost management is determined by the supply conditions, the labor market and the cost needs.

The investment activity influences the return on equity by the return on invested capital. This is determined by the capital turnover, both the current and the fixed one. The current capital turnover is given by the management of stocks, of claims and of operating debts. The fixed assets turnover is determined by the investment budgeting and by the project management.

The financing activity influences the return on equity through the financial leverage effect. One of the factors of influence of financial leverage effect is the leverage, which is determined by the debt policy, the dividend policy and by the financial risk of the business.

Such a decomposition of ROE can be used to analyze the impact of decisions taken by the company management on the shareholders' remuneration. However, it can be used to track the interdependencies between different factors of influence, respectively to follow the effects of a decision on different sides of the business activity but also to track the combined effect of several policies adopted on the three activities, and finally, on the return on equity.

2. OBJECTIVES

In order to emphasize the degree the three factors of influence (the leverage, the asset turnover and the net profit margin) determine the return on equity, we conducted a statistical survey on a sample of Romanian industrial companies. The survey covered the year 2008 and the data used were extracted from the financial statements of the companies. The sample extraction was performed from a database which included 600 large Romanian companies, namely those who have over 250 employees. As a sampling method, the sampling fraction was used, thus being retained every fifth company from the selection base ordered after the classification of activities from the national economy. This procedure applied, 73 companies were finally included in the sample.

The research goal is to test the correlation between the return on equity, on one hand, and its influence factors, on the other hand. As noted in the previous paragraph, we assume the existence of a correlation between these variables, correlation which will be analyzed in this study, using the statistical methodology in particular.

3. METHODOLOGY

The synthetic indicators calculated based on the financial statements of the 73 companies are:

- Dependent variable: Return on equity = $\frac{\text{Net Profit}}{\text{Equity}}$ (1)

- Independent variables:

a) Operating margin = $\frac{\text{Net Operating Profit}}{\text{Turnover}} =$
 $= \frac{\text{Operating Profit} - \text{Income Tax}}{\text{Turnover}}$ (2)

b) Total Assets Turnover = $\frac{\text{Turnover}}{\text{Total Assets}}$ (3)

c) Leverage = $\frac{\text{Total Debts}}{\text{Equity}}$ (4)

The leverage was calculated as the ratio between the total debts and the equity and not with the relationship of the equity multiplier. We appreciate that the findings will not be affected given the similar significance of the two financial rates. It is noted that, due to the lack of information, the debts include all the debts and not just the financial ones (the borrowed capital, which generates interest expenses).

The data obtained were processed using the SPSS software.

4. ANALYSES

The return on equity vary widely among the companies analyzed, fluctuating between a minimum of -14.20% and a maximum of 87.30%. The average of this rate was 10.34% with a standard deviation of 15.64%. Of the 73 companies sampled, 23 posted a ROE higher than average. The average level of the return on equity is low, meaning the shareholders get a remuneration close to their minimum requirements. Given the very small gap between the average return on equity and the risk-free rate in 2008 (the latter being about 9%), we can appreciate that the large industrial firms in the Romanian economy did not provide an adequate remuneration to shareholders to justify the risk taken.

The operating margin averaged 8.09%, the minimum value being -2.39% and the maximum one 127.61%. In this case too we obtained a high volatility within the range, which is pointed out by the high standard deviation, of 15.05%. The high volatility is explained by the variety of branches in the industry sector, each with its own features, which decisively influences this rate.

The total assets turnover was 0.99 turns, the minimum being 0.26 and the maximum 7.31. The standard deviation has, however, a lower value as compared with the other two financial rates, respectively 1.04, which means a greater representativeness of the mean. The efficiency of total assets is quite low overall, which is justified by the high volumes and values of fixed assets, absolutely necessary to

perform processing operations with a high complexity. The large industrial firms usually have slow turnovers of total assets, that's why the values obtained in this case are not surprising.

In order to emphasize the impact of the three factors of influence on the return on equity, we analyzed the correlation between ROE, on one hand, and each influence factor taken separately, on the other hand.

The first tested correlation was between the return on equity and the operating margin. To characterize the correlation between the two variables, we used the linear regression analysis, in which the dependent variable (Y) is determined by the level of one or more independent variables (X1, X2,..., Xn), plus the error term, which amounts the influences of variables not included in the model on the variable Y. The general form of the simple model of linear regression is:

$$Y = \alpha + \beta \cdot X \quad (5)$$

where: α – points out the value of Y when X = 0;

β – the regression coefficient, which points out the degree of dependence between variables;

Thus: $\beta > 0$ – direct connection (positive);

$\beta < 0$ – inverse connection (negative);

$\beta = 0$ – no connection.

The calculations made led to the following results:

Table no. 1

Indicator	Value
Constant coefficient (α)	6.206
Regression coefficient (β)	0.552
Pearson coefficient (R)	0.531
Coefficient of determination (R Square)	0.282

The linear regression equation takes the following form:

$$ROE = 6.206 + 0.552 \cdot OM \quad (6)$$

where:

OM – the operating margin (the net operating profit margin).

The level of α is quite high and means that 6.206% of ROE is explained by the influence of other factors not included in the model. Such a situation was expected to occur, given that there are two other influence factors in the theoretical model originally presented. Also, in practice more other factors besides the theoretically ones could be involved, and that can explain more or less of the depending variable, which justifies the result obtained.

The regression coefficient is positive and signifies a direct correlation between the variables studied, but its level is quite low. The regression coefficient shows the impact of the net operating profit margin on ROE; so, if the operating margin is 1%, ROE increases only with 0.552%. However, for most companies in the sample, the operating margin is bigger than 1% (its average level is 8.09%), which means it has a significant contribution to the variation of ROE.

To emphasize the power of correlation, we used the Pearson linear correlation coefficient. In our case, the correlation coefficient takes the value 0.531 which means a direct correlation of average power between ROE and the net operating profit margin. This means that an increase of margin determines an increase of ROE. The significance

of this result is assessed using the Student test (t), which for our case takes the value of 5.28. Since the calculated t is greater than the theoretical t of 1.994, this means that the Pearson correlation coefficient is significant and between the variables "return on equity" and "operating margin" there is a causal connection.

The coefficient of determination (R Square) expresses the variation of the dependent variable explained by the variation of the independent variable included in the model. It takes values between 0 and 1. In our study, R Square equals 0.282, i.e. 28.2% of the return on equity was due to changes in the operating margin, while the remaining 71.8% remains unexplained.

We appreciate that there is a direct correlation, of average power, between the two variables studied. A relatively small part of the return on equity is explained by the net operating profit margin. An important part of this rate (more than 70%) remained unexplained, which is due to other factors of influence.

The second factor of influence for which the correlation is tested is the total assets turnover. For this, the same steps as in the case of the operating margin were followed. By applying the linear regression analysis, the following data were obtained:

Table no. 2

Indicator	Value
Constant coefficient (α)	9.543
Regression coefficient (β)	1.017
Pearson coefficient (R)	0.068
Coefficient of determination (R Square)	0.005

The linear regression equation takes the following form:

$$ROE = 9.543 + 1.017 \cdot T_{TA} \quad (7)$$

where:

TTA – total assets turnover (the efficiency of total assets).

The constant α has a very high value, meaning that 9.543% of ROE is explained by the influence of other factors not included in this model. The regression coefficient is positive and shows a direct correlation between the two variables studied. For a value of 1% of total assets rotation, ROE increases by 1.017%.

The Pearson linear correlation coefficient is very low, only 0.068, which means there is a direct correlation with a low power between ROE and the total assets turnover. The application of Student test confirms the lack of correlation between the variables tested, achieving a calculated level for t of 0.570, much lower than the theoretical value of 1.994.

The coefficient of determination (R Square) also has a low level, of 0.005, meaning that 0.5% of the return on equity was due to changes in total assets efficiency. In conclusion, we consider that there is no statistical correlation between the two variables analyzed.

The last influence factor the correlation is tested for is the leverage. After applying the linear regression analysis, the following data were obtained:

Table no. 3

Indicator	Value
Constant coefficient (α)	10.687
Regression coefficient (β)	0.001
Pearson coefficient (R)	0.038
Coefficient of determination (R Square)	0.001

The linear regression equation has the form:

$$\text{ROE} = 10.687 + 0.001 \cdot L \quad (8)$$

where:

L – the leverage.

The constant α has a high value (10.687), meaning that a large percentage of ROE is explained by the influence of other factors. The regression coefficient is positive, but very small (0.001).

The Pearson coefficient points out the absence of a correlation between the variables studied, with a value of 0.038. The Student test confirmed the lack of correlation between these two variables, achieving a calculated level for t of 0.753, less than the theoretical value of 1.994.

The coefficient of determination (R Square) has also a low level (0.001), confirming the low influence of leverage on ROE, for the sample of firms selected. In this case too, we consider that there is no statistical correlation between the two variables tested.

5. CONCLUSIONS

In this paper, the return on equity was analyzed as dependent variable, while the net operating profit margin, the total assets turnover and the leverage were considered as independent variables. The starting point for this research was the theoretical relationship between the four variables above, as this relationship is stated by most of the specialized works in the field of economic and financial analysis. E. Helfert has made even a systemic approach of the factors of influence of ROE, making a division to explain the initial causes of variation of this rate of return. However, the results on the sample of 73 Romanian large companies operating in industries only partially confirm the original assumptions. Synthesizing these results, the main conclusions are:

- The methodology used was mainly the statistical one;
- Only the simple correlation between the variables was analyzed, and not the multiple one;
- Only the linear correlation between the variables was analyzed; the absence of such a linear correlation does not, however, exclude the possibility of a non-linear correlation;
- Of the three independent variables tested, only for the net operating profit margin was confirmed a correlation with the return on equity; however, the operating margin doesn't explain too much of the level of return on equity;
- For the total asset turnover and the leverage, the analysis invalidated the existence of a linear correlation;
- The results can be affected by the fact the debts included the total debts and not just the financial ones;

- The survey results may be affected by the sampling procedure, but also by the heterogeneousness of the companies, as they run in all industries;
- The correlation between the three factors of influence was not tested. Between them it might exist a causal connection. Thus, in theory it is accepted the existence of an inverse correlation between the total asset turnover and the operating margin and the connection between them may affect the study results;
- As expected, the analysis of correlation based on a statistical sample can reveal the possibility of existence of other influence factors than those included in the theoretical model.

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