THE MARKET VALUE ADDED AND THE RETURN ON INVESTED CAPITAL FOR INDUSTRIAL ROMANIAN FIRMS

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1. Introduction

For a long time, maximizing the profit was the major objective of the company's management. But such an objective proved to have a series of limits, such as: focusing on short time periods instead of medium and long time strategic objectives; the relations with the customers, the suppliers, the employees are getting worse; a bad connection with the encashment and the payments that are made etc. Gradually, due to its limits, such an objective was replaced by another, "*maximizing the company's value and by this the shareholders' wealth*". It is considered that, in order to create value, a company must generate results big enough to cover its operating expenses and to ensure a proper remuneration for the invested capital.

"The market value added" is an indicator which is used to appreciate the capacity of the company to create value added. The evolution of this indicator is closely connected with the evolution of the share price which is further influenced both by quantifiable financial indicators and emotional, non-quantifiable factors. In these circumstances, the level of the market value added is also influenced by such factors. However, in normal circumstances, the financial factors should have the biggest contribution on explaining the changes occurred in the market value added.

The financial factors can be divided into internal and external factors. The internal factors originate inside the company and depend on its activity: the return, the accessibility in procuring the resources, the efficiency in using them etc. The external factors originate outside the company and are independent on its activity: the general and sector economic circumstances, the intensity of the competition, the rate of inflation etc.

Out of the assembly of the factors that influence the market value added, we'll further focus on studying the dependence between its level and the return. In this study, in order to appreciate the return, we considered the return on invested capital as being relevant, because it points out the investors' interests as well as the market value added.

2. Concepts and methodology

Two indicators are the objective of this study: the market value added and the return on invested capital.

The market value added (MVA) is closely connected with the capacity of the business to generate value in the future, which represents the object of activity the business is running for. It expresses the wealth the company generates for its shareholders, over the net accounting value of the assets. It is determined as a difference between the market value of the owned equity or the market value of shares (MVS) and the

account value of the equity (E) or the net account assets (NAS):

MVA = MVS – E (NAS)

The market value of shares (MVS) is determined by multiplying the share price (SP) from the closing of the financial exercise with the number of shares (NS):

MVS = SP x NS.

If the company is not listed, it is necessary to be evaluated, using proper evaluation methods. *The account value of the equity* is taken from the financial statements.

In order to make comparisons between companies, the influence of the size factor was removed by calculating a percentage market value added, dividing its level by the equity:

$$\text{MVA}\% = \frac{\text{MVA}}{\text{E}} \times 100$$

The market value added points out how much value was added or lost against the investment of the shareholders (Dincă M. 2001:3). The profitable companies and with chances of development create market value added and thus increase the value of the capital invested by the shareholders while the non-profitable companies decrease the value of the initial invested capital.

The level of the market value added depends on the level of the return on equity. Thus, if the return on equity is higher than the cost of owned capital, the market value of the company's shares will grow over the level of the initial investment and the value added will be positive. We can say that the market value added is closely connected with the economical value added. The market value added is the discounted amount of all the future economical values added, which means that a positive economical value added signifies a positive market value added.

The return on invested capital (RIC) expresses the efficiency in using the owned and borrowed capital and can be calculated as follows:

$$\text{RIC} = \frac{\text{OP}}{\text{IC}},$$

IC – invested capital;

IC = E + BC;

E – equity (owned capital);

BC – borrowed capital;

P – operating profit.

Depending on the level of this rate, the creditors appreciate the capacity of the company to remunerate the borrowed capitals according to the loan contracts. The level of this rate should exceed the average level of the interest rate for the contracted loans, so as the creditors get a remuneration that covers the risk. We have to mention that this indicator points out the average level of the remuneration of the capital suppliers, while the shareholders and the creditors get different returns, because the risks they take are not the same. That's why this rate is also important for the managers. In this respect, they set the return on invested capital against the weight average capital cost (WACC) and thus the following situations can occur (Buşe L. 2005:2):

- if *RIC* > *WACC*, the run activity generates a return higher than the cost of capital and this further generates a positive economical value added which will increase the market value of the company;
- if *RIC* < *WACC*, the return cannot cover the capital suppliers' demands and this signifies a negative economical value added and a diminution of the owned capital.

3. Results

To analyze the correlation between the market value added and the return we have selected a number of 17 Romanian industrial companies listed on the Bucharest Stock Exchange (BSE), for which we processed the financial statements for a two years retrospective period (2006-2007). The companies included in the survey are spread all over the country and cover the main industrial

sub-branches. They fall into the large enterprises category and are representative for the sectors they belong to. The identification data of these firms are presented in Appendix A.

The *market value added* was calculated for each company, depending on the market value and the account value of equities. The market value of shares represents the product of market price and the number of shares. Necessary data were taken from the BSE website (www.bvb.ro). The account value of equities is represented by the equities value in the balance sheet to which were added incomes registered in advance and were deducted expenses registered in advance. The level of the market value added for the 17 companies analyzed in the period 2006-2007 is presented in Appendix B.

The market value added growth in 2007 (ΔMVA) was calculated as follows:

$$\Delta MVA = MVA_{2007} - MVA_{2006}$$

and the percentage growth of MVA in 2007:

$$\Delta MVA\% = \frac{\Delta MVA}{E_{2007}} \times 100.$$

At the end of 2006, 10 of the 17 companies analyzed were recording a market value lower than the net account asset, which means a negative market value added, situation judged unfavorably. Positive market values added were recorded in the other 7 companies, among which the highest in Company 1 and Company 6. On the whole for all the 17 companies, at the end of 2006 it was recorded a market value added of 84,493,036 lei, causing an increase of 14.32% of the aggregate equity value.

In 2007 the situation has improved for the analyzed firms, only 6 of them recording a negative MVA. The highest values were registered at Company 8 and Company 6. The total market value added amounted to 654,200,637 lei, being 674.3% higher against the previous year, causing an increase in equity by 67.55%, which is judged favorably.

Comparing the market value added at the end of the two years, it has been ascertained that in 2007 there have been value losses at 5 of the companies. The other 12 companies added market value, the largest increases being recorded at Company 8 and Company 13. Performing a comparison based on percentage increases of MVA, we find that the biggest increase is recorded again in Company 8, followed however by Company 9 and then by Company 13.

In order to explain these changes in companies' market value, we will enter into the analysis a financial factor: *the return on invested capital*. The level of the return on invested capital for the 17 enterprises under analysis was calculated based on the data from the financial statements, the results obtained being presented in Appendix C.

From the analysis of this data we find out that in 2006 there has been recorded a higher level of this rate, the average for the 17 firms was 10.72%, while in 2007 its average fell to 10.09%. The decrease of return on invested capital was due to the increase of the invested capital in a higher growth rate than the operating profit, which draws an alarm signal on the effectiveness of investments made during the year.

Following the distribution of the 17 companies according to the return on invested capital, it is found that this rate's values were scattered in a range high enough, so that the companies can be divided into three groups:

- *Group A* consists of 2 companies that were unprofitable in 2007: Companies 14 and 15;
- *Group B* formed of 10 companies which, although they were profitable, they didn't remunerate sufficiently the investors: Companies 1, 2, 3, 5, 10, 11, 12, 13, 16 and 17;
- *Group C* consists of 5 companies with a satisfactory level of the return on

invested capital: Companies 4, 6, 7, 8 and 9.

Based on this data, we appreciate that although most of the analyzed companies posted profit in the period under review, the level of the return on invested capital is insufficient to pay the creditors and the shareholders and consequently they are obliged to take urgent measures to improve the situation.

To capture the relationship between the market value added and the return, we compared the increase of this indicator in 2007 with the return on invested capital. It is noted that Company 8, which recorded the largest increase in market value added in 2007, also obtained the highest return on invested capital, confirming the existence of a direct correlation between them. The correlation is also checked with other companies such as: Company 9, Company 4, Company 6 and Company 7. But there are also companies where there were significant differences between the two indicators. Thus, Company 13 has recorded a strong increase in the market value, while the rate of return was low, the company being, according to this criterion, on rank 14 of the 17 ones analyzed. These differences may be explained by the increase of the market price due to non-financial factors rather than by the financial results obtained.

The different evolution of the two indicators requires using statistical and mathematical methods for characterizing the correlation between the two variables. For this purpose we rely on the linear regression analysis through which the level of the dependent variable (Y) is determined depending on the level of one or more independent variables (X_1, X_2, ..., X_n), to which the error term is added, which reflects the influences, on variable Y, of the variables which are not included in the model. The general form of the simple linear regression model is:

$$Y = \alpha + \beta \cdot X,$$

α – reflects the value of Y when X = 0;

β – regression coefficient showing the degree of dependence between the variables.

Therefore:

- β > 0 – direct relationship (positive);
- β < 0 – reverse relationship (negative)
- β = 0 – there is no relationship.

For the regression analysis between the market value added and return we resorted to the statistical program SPSS (Statistical Package for the Social Sciences) in which we introduced the percentage increase of the market value added in 2007 (ΔMVA%), as the dependent variable (Y), and the return on invested capital in 2007 (RIC), as the independent variable (X), for the 17 companies taken into study. The results are presented in Table 1.

Table 1: Simple Linear Regression Analysis

Indicator	***Value***
Constant coefficient (α)	9.651
Regression coefficient (β)	5.086
Pearson correlation coefficient (R)	0.688
R Square	0.473

On the basis of the values registered for the market value added and the return on invested capital in these 17 firms, we have obtained the following linear regression equation, which allows us to determine the theoretical values for the percentage increase in the market value added depending on the rate of return:

$$\Delta MVA\% = 9.651 + 5.086 \times RIC.$$

This means that on behalf of the influence of the other factors not included in the analysis, the market value added would have increased by 9.651%. The positive value of β means that there is a direct correlation between the variables studied, i.e. for a return on invested capital of 1%, the market value added increases with 5.086%.

To capture the intensity of the correlation, we used to Pearson correlation coefficient. The coefficient assigns theoretical values between -1 and 1. If its value is negative, we are dealing with a reverse correlation, and if it is positive, we are dealing with a direct correlation. In the conducted study, the Pearson correlation coefficient takes the value 0.688 which means there is a direct correlation of average intensity between the market value added rate and the rate of return on invested capital. This means that on an increase in the rate of return, an increase in the market value of companies is also registered. The significance of this result is evaluated using the Student test (t), calculated using the formula:

$$t = R\sqrt{\frac{n-2}{1-R^2}}.$$

For the conducted study:

$$t = (0.688)\times\sqrt{\frac{17-2}{1-(0,688)^2}} = 3.672.$$

The tabular value of *t* for 17-2 degrees of freedom and α = 0.05 is 1.734. Since in our example *t* is outside the tabular interval [-1.734; 1.734] it means that the level of the Pearson correlation coefficient is significant and between the variables "market value added" and "return on invested capital" there is a causal relationship.

The R Square expresses how much of the variation in the dependent variable is explained by the variation of the independent variable included in the model. It assigns values between 0 and 1. If R Square is equal to 1 it means that the regression model perfectly explains the relationship between variables. In the study conducted R Square = 0.473, i.e. 47.3% of the market value added growth was due to changes in the return on invested capital, while the rest of 29.6% remains unexplained.

In conclusion, we appreciate that between the market value added and the return on invested capital for the Romanian companies listed on BSE there is an average intensity direct correlation. A significant part of the increase in market value of the companies analyzed was explained on behalf of the return of the invested capital. However, an important part of this increase (over 50%) remained unexplained, due to the influence of other factors, some of them financial, but mostly non-financial that render "interesting" the stock exchange investments.

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APPENDIX

Appendix A: The Selected Companies from the Survey

No.	Name	Activity
1.	ALBALACT	Milk Processing
2.	ARGUS	Edible Oil Production
3.	ARTECA	Other Rubber Products Manufacturing
4.	ARTEGO	Other Rubber Products Manufacturing
5.	BEGA TEHNOMET	Metal Building
6.	DUCTIL	Wiredrawing
7.	ELECTROARGES	Home Appliances Manufacturing
8.	IPROEB	Electrical Cables and Wires
9.	LAFARGE AGREGATE SI BETOANE	Building Stones Extracting
10.	MAT Craiova	Agricultural Machines Manufacturing
11.	PRODLACTA	Milk Processing
12.	ROMCAB	Other Plastic Products
13.	ROMCARBON	Plastic Masses
14.	SAMUS MEX DEJ	Furniture
15.	SEVERNAV	Ships Building
16.	TRANSILANA	Wool Fibers
17.	UPET	Oil Tools Manufacturing

Appendix B.1: The Calculus of the Market Value Added

Company number	Market Value		Equity	
	2006	2007	2006	2007
1	117,047,944	139,922,045	25,284,346	91,213,396
2	82,358,349	71,615,956	48,882,982	68,096,105
3	2,044,257	14,495,637	15,037,143	19,600,247
4	29,848,131	129,341,901	66,788,259	76,177,123
5	6,177,774	25,122,948	33,824,323	37,135,931
6	163,756,404	252,074,465	89,144,229	95,592,324
7	2,925,629	10,176,100	5,007,733	6,101,334
8	67,033,825	332,364,522	45,100,862	69,888,283
9	83,998,460	184,196,623	47,559,387	53,317,565
10	10,243,695	11,985,247	29,536,708	130,615,625
11	17,385,965	39,954,944	19,898,576	28,223,179
12	9,520,000	70,000,000	54,649,000	45,712,900
13	40,405,642	257,311,028	22,891,930	132,801,217
14	8,215,771	8,166,232	3,693,434	9,260,181
15	26,720,194	50,919,615	47,876,245	37,919,365
16	2,481,508	4,466,715	7,157,010	7,203,963
17	4,420,892	20,551,172	27,759,237	59,605,775
TOTAL	***674,584,440***	***1,622,665,150***	***590,091,404***	***968,464,513***

Appendix B.2: The Calculus of the Market Value Added Growth

Company number	MVA		MVA%		ΔMVA	ΔMVA%
	2006	2007				
1	91.763.598	48.708.649	362,93	53,40	-43,054,949	-47.20
2	33.475.367	3.519.851	68,48	5,17	-29,955,516	-43.99
3	-12.992.886	-5.104.610	-86,41	-26,04	7,888,276	40.25
4	-36.940.128	53.164.778	-55,31	69,79	90,104,906	118.28
5	-27.646.549	-12.012.983	-81,74	-32,35	15,633,566	42.10
6	74.612.175	156.482.141	83,70	163,70	81,869,966	85.64
7	-2.082.104	4.074.766	-41,58	66,78	6,156,870	100.91
8	21.932.963	262.476.239	48,63	375,57	240,543,276	344.18
9	36.439.073	130.879.058	76,62	245,47	94,439,985	177.13
10	-19.293.013	-118.630.378	-65,32	-90,82	-99,337,365	-76.05
11	-2.512.611	11.731.765	-12,63	41,57	14,244,376	50.47
12	-45.129.000	24.287.100	-82,58	53,13	69,416,100	151.85
13	17.513.712	124.509.811	76,51	93,76	106,996,099	80.57
14	4.522.337	-1.093.949	122,44	-11,81	-5,616,286	-60.65
15	-21.156.051	13.000.250	-44,19	34,28	34,156,301	90.08
16	-4.675.502	-2.737.248	-65,33	-38,00	1,938,254	26.91
17	-23.338.345	-39.054.603	-84,07	-65,52	-15,716,258	-26.37
TOTAL	***84.493.036***	***654.200.637***	***14,32***	***67,55***	***569,707,601***	***58.83***

Appendix C: The Level of Return on Invested Capital

Company number	RIC	
	2006	2007
1	13.98	7.52
2	-11.78	6.28
3	193.49	10.96
4	9.33	17.46
5	19.96	5.49
6	20.85	15.85
7	-3.29	17.24
8	39.36	40.50
9	30.12	39.63
10	6.81	9.90
11	3.46	3.57
12	2.54	2.81
13	16.88	2.25
14	-10.65	-19.82
15	-3.56	-2.57
16	3.44	7.70
17	-44.10	10.22
TOTAL	**10.72**	**10.09**