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THE IN-DEPTH EVALUATION OF THE PROFITABILITY OF A COMPANY WITH THE CONSIDERATION OF THE DU PONT MODEL AND CAUSAL ANALYSIS. CASE STUDY

In the following article the author discusses the question of profitability, presenting a thesis which refers to the inadequacy of methods applied to the development of the ROE. They result in the fact that the potential of the analysed entity is not fully exploited, and therefore its financial performance has become worse. The case study has been based on the annual financial reports (2012–2015) provided by Alma Market S.A., a company listed on the Warsaw Stock Exchange S.A.

Considering negative results in liquidity and attendant risk which has been lasting for many years, the profitability results come as particularly interesting – they should be higher because of a cheaper financing source (the cost of foreign short-term capital in the form of trade liabilities is lower than other financing sources. It results in a drop in the WACC and an increase in the return on equity, ROE). A preliminary analysis of the profitability of the company, however, does not indicate such a relation. Hence, to evaluate the performance of the company, the Du Pont model has been applied with causal analysis. The methods have been used to define the reasons for negative changes of the ROE ratio and to present inadequacy (the lack of use?) of the methods used to manage that ratio.

Keywords: *the Du Pont model, the return on equity, causal analysis, economic analysis.*

Альдона Узембо. ПОГЛИБЛЕНА ОЦІНКА ПРИБУТКОВОСТІ КОМПАНІЇ З ВИКОРИСТАННЯМ МОДЕЛІ DU PONT І ПРИЧИННОГО АНАЛІЗУ. ВИПАДОК ІЗ ПРАКТИКИ

Проаналізовано питання рентабельності, представляючи тезу, що належать до неадекватності методів, застосовуваних для розвитку ROE. Вони призводять до того, що потенціал аналізованого суб'єкта не використовується повною мірою, і, отже, фінансові показники погіршуються. Конкретне дослідження базується на річній фінансовій звітності (2012–2015), наданій Alma Market S.A., компанії, що котирується на Варшавській фондовій біржі S.A.

Ключові *слова: модель Du Pont, рентабельність власного капіталу ROE, причинний аналіз, економічний аналіз.*

The question. Maintaining financial liquidity of a company occurs at a certain cost of its profitability, by keeping the level of working assets which guarantee security of the turnover and/or the limitation of financing with the use of the cheapest kind of short-term liabilities. It can be observed that some companies struggle against serious problems pertaining to their liquidity which are related to the drop in the most important profitability ratios.

The analysis of the latest research and publications. The starting point for the presented considerations is a number of publications by Buffet and Piketty, in which the ROE ratio is discussed (Buffet) alongside the very essence of profitability, referring to broadly understood capital (Piketty). Considering expert literature on financial analysis and corporate finance, an answer which could unambiguously explain the relation between liquidity and profitability has not been found yet. The fact can indicate their individual and differentiated background.

The aim of the article is to determine possibilities of an analysis of the reasons for the problems which refer to financial liquidity and negative development of the ROE.

The following methods and research tools have been applied: the analysis and critique of expert literature and the analysis of the documentation provided by Alma Market S.A., including unit financial reports from the years 2012–2015. In the research part of the article, descriptive analysis has been applied to characterise the research field; ratio analysis has been used to test profitability, the Du Pont model and causal analysis have been used to explain the changes of the ROE. Moreover, there have been graphical methods applied (tables, charts) to present the results of the research.

The analysed entity is Alma Market S.A. (30-964 Kraków, 6 Pilotów St., Poland), a leading company of Alma Market S.A. Corporate Group, which has been listed on the Warszaw Stock Exchange S.A. since 28th July 1994. Alma Market S.A. was established in 1991 in Kraków. It operates mainly in the retail sector, trading fast moving consumer goods and operating a chain of Alma delicatessen shops. At present, the chain consists of 45 shops based in large Polish cities. Alma Market S.A. is a unit which controls the whole corporate group. On 31st December 2015 the group consisted of dependent units (subsidiaries) which operated mainly in the sector of retail and wholesale trade and of some units the activities of which were focused on property lease. All the subsidiaries underwent full consolidation in the consolidated financial report for the year 2015.

The main measures of profitability and their proper development are presented in *Table 1*. Considering the limited framework of the article, a discussion of the modifications pertaining to the numerator (the level of net, gross, operational financial results) and the denominator (averaging of the balance sheet items, etc.) has been omitted.

The basic equations which have been applied in the Du Pont model are also presented.

Income is a stream corresponding to the produced wealth which is divided in a certain period of time; capital comes as an asset, the total amount of wealth owned at a particular moment. The most natural and adequate way to measure capital is to compare it to the annual income stream (T. Piketty). That general statement sends us to the ROE ratio which comes as a crucial criterion in the assessment of the company performance, especially for the company owners (shareholders). Hence, it leads us to further, in-depth analysis of that relation. It informs us about the rate of return on the capital invested in the company.

Ratio	Equation	Standard
ROE	$\frac{\text{net profit}}{\text{equity capital}}$	High/growing ratio allows us to assess the financial situation as favourable; the growth resulting from the dynamics of the profit which is higher than the dynamics of the capital also deserves positive evaluation (it often indicates the use of financial leverage); in the case of a negative financial result, the situation should be quite the opposite
ROA	$\frac{\text{net result}}{\text{total assets}}$	High/growing ratio allows us to assess the financial situation as favourable; the growth resulting from the dynamics of the profit which is higher than the dynamics of the total assets also deserves positive evaluation (it often indicates justified growth of the assets, proved by their proper use and, in the result, by growing profits); in the case of a negative financial result, the situation should be quite the opposite
ROS	$\frac{\text{net result}}{\text{sales revenue}}$	High/growing ratio allows us to assess the financial situation as favourable; the growth resulting from the dynamics of the profit which is higher than the dynamics of the sales revenue also deserves positive evaluation (it often indicates the high margin and a proper structure of costs); in the case of a negative financial result, the situation should be quite the opposite

Table 1: **The characteristics of basic profitability ratios**

Providing information about the share of the financial result in the total assets of a company, another ratio, that is namely: the return on assets (ROA), determines the efficiency of the management of assets and their proper use. The last ratio presented in *Table 1* is the return on sales (ROS) which indicates profitability (unprofitability) of sales. It presents the share of the financial result in the total sales.

All the ratios, and the ROS especially, depend on the type of activities performed by a company. Therefore, considering their analysis, it is particularly important to compare them not only in time but also in the same business sector.

The results of the discussed profitability ratios in the years 2012–2015 for Alma Market S.A are presented in *Chart 1*. In 2013 there was an increase in all the ratios (for each 100 units of equity capital there was respectively 0.86 of a profit unit in 2012, and 2.82 of profit units in 2013; the profitability of assets was increased from 0.35% to 1.14%, and the profitability of sales was increased from 0.21% to 0.6%). However, in the subsequent years there was a dramatic deterioration of financial performance. The company faced financial shortfall, that is: its capital, assets and revenues started to generate loss.

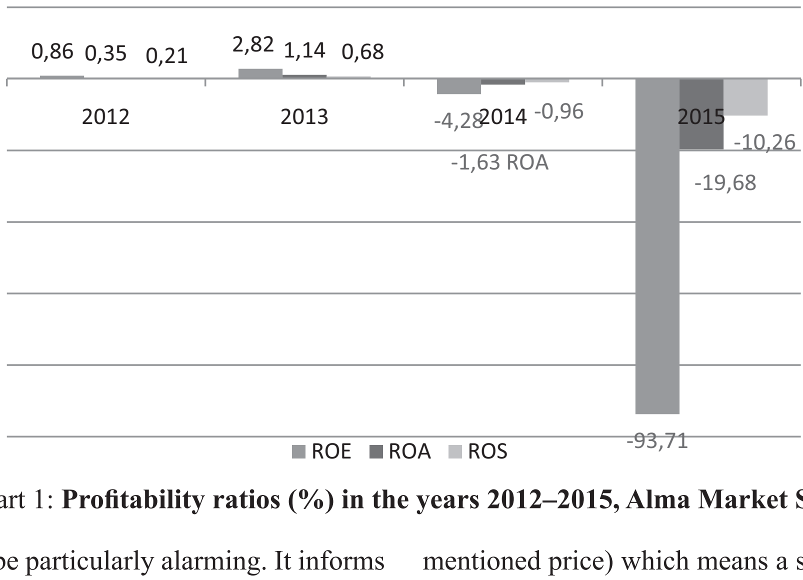

Chart 1: **Profitability ratios (%) in the years 2012–2015, Alma Market S.A.**

The ROE ratio can be particularly alarming. It informs investors that each 100 units of capital involved in the company generates 4.28 (2014) and as many as 93.71 units of loss (2015). Weak results of – among others – profitability resulted in a drop in the share value on the stock exchange (Chart 2) during the discussed period of time.

In October 2013 the shares of the company reached their maximal value of 42.88 PLN/share (approximately 10.26 EUR at the price determined by the central bank in October 2013); then their value dropped to 7 PLN/share in December 2015 (approximately 1.65 EUR at the above-mentioned price) which means a shortfall by over 80% in two years' time. Considering the point of view represented by the potential investors, who make their decisions based on the cost calculation of the lost opportunities, the drop in the ROE, combined with the decrease in share prices, is exceptionally alarming.

The reasons for such results are analysed with the use of the Du Pont method, which consists in the analysis of relations between the net profit margin, the asset turnover, the level of debts incurred by the company and the ratio of the return on equity (ROE), where:

$$ROE = ROS \times AT \times EM,$$

Abbreviations:

AT (Asset Turnover, asset productivity) = sales revenue: total assets

EM (Equity Multiplier, Finanical Leverage; multiplier of equity capital which represents financial leverage) = equity capital: total assets

Other equations – as presented in *Table 1*.

The competitiveness of companies follows undulating patterns every day, but it occurs in different ways. If a company has achieved excellent return on equity capital for several subsequent years, its manager deserves a great deal of accolade; however, if the return on equity has reached an average level and the amount of the capital has grown proportionally to the income, we should wait with congratulations (Warren Buffett). The Du Pont model comes as one of the most popular methods applied to provide an enormous increase in the ratio of net profitability of equity (funds) capital. Understanding the ROE as a result of the combination of three elements (ROS, AT, EM), it is possible to evaluate its changes in relation with the change in the financing structure, productivity of assets and sales profitability. Hence, the changes in the value of the particular factors are not the only interesting elements – the relations which appear among them are thought-provoking as well. To provide proper evaluation, the selected methods of causal analysis (the subsequent replacement method) have been applied, defining the scope which refers to the influence of changes exerted by the particular ratios on the change in the synthetic ROE ratio.

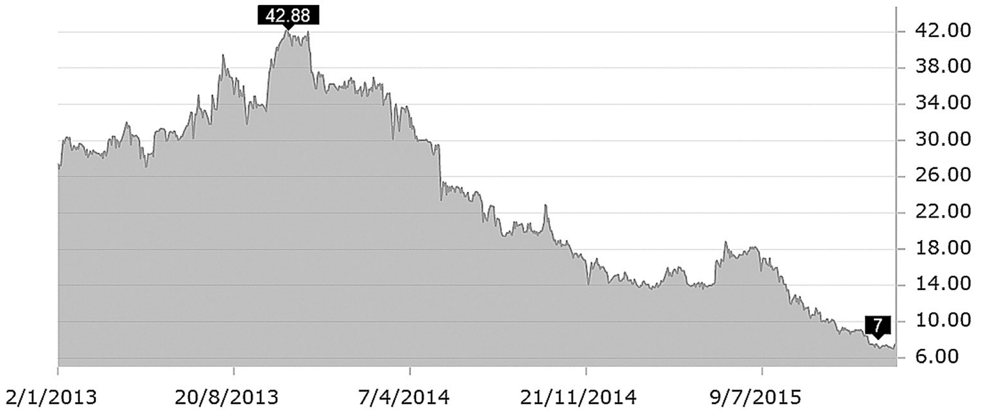

Chart 2. **The share value of Alma Market S.A. on the Warsaw Stock Exchange between 2nd January 2013 and 31st December 2015**

For the three tested factors patterns in this method are as follows:

$$ROE = ROS \times AT \times EM$$
$$\Delta ROE = ROE_1 - ROE_0$$
$$O_{ROS} = (ROS_1 - ROS_0) \times AT_0 \times EM_0$$
$$O_{AT} = (AT_1 - AT_0) \times ROS_1 \times x\ EM_0$$
$$O_{EM} = (EM_1 - EM_0) \times ROS_1 \times AT_1$$
$$\Delta ROE = O_{ROS} + O_{AT} + O_{EM}$$

Abbreviations:

ROS, AT, EM – factors which affect the ROE

0 – the initial value of the analysed ratio,

1 – the final value of the analysed ratio,

ΔROE – total deviation (totally, to explain) the analysed ratio.

The development of all the ratios included in the Du Pont model is presented in *Table 2*. The productivity of assets (AT) presents a proper, growing tendency during the analysed period of time (the increase from 1.65 to 1.92 means that each unit of equity has generated from 1.65 to 1.92 unit of revenue).

However, it is more difficult to evaluate the multiplier of the equity, EM. During the years 2012–2013 it was maintained at a stable level, indicating that there was 2.47 units of the total assets per one unit of the equity capital, it means that the external capital financed approximately 60% of the assets belonging to the discussed company. Such a value is considered high and acceptable (as the financial leverage). In 2015 the increase in the ratio up to the level of 4.76 means that almost 80% of the assets were financed with the short-term and long-term debts. Such a high debt is dangerous for the creditors (problems with financial liquidity and potential problems with solvency). The owners might expect some exceptional profits related to the leverage of the profits, however, in the case of the company there has been some loss. It means that the strong financial leverage has additionally worsened its financial performance. There has been a decrease in the equity capital, related to the high net loss and the loss of profits for investors. The reasons for the ROE changes have been analysed with the use of causal analysis (*Table 3*).

ratio/year	2012	2013	2014	2015
ROE (%)	0,86020	2,81648	-4,28370	-93,71070
ROS (%)	0,21045	0,68047	-0,95896	-10,26305
AT	1,65248	1,67414	1,69715	1,91767
EM	2,47353	2,47231	2,63207	4,76144
ROE = ROSxATxEM	0,8602	2,8165	-4,2837	-93,7107

Table 2: **The crucial ratios required for the Du Pont analysis during the years 2012–2015, Alma Market S.A.**

Compared to 2012, in 2013 the ROE grew up by 1.96 p.p.; it means that the net profit increased by 1.96

of the unit per each 100 units of the involved capital. The increase resulted almost entirely from the favourable development of sales profitability (the growing net profit and attendant slower increase in revenues indicated a decreasing share of costs and growing margins). The EM multiplier did not change, hence the structure of financing did not affect the change in the ROE. A small increase in the productivity of the assets AT resulted in an insignificant growth in the ROE, only by 0.04 p.p. (*Chart 3*).

Deviation/years	2013-2012	2014-2013	2015-2014
total ROE	1,96	-7,10	-89,43
partial ROS	1,92	-6,79	-41,56
partial AT	0,04	-0,06	-5,96
partial EM	0,00	-0,26	-41,91
partial = total	1,96	-7,10	-89,43

Table 3: **Partial and total deviation in the causal analysis of the ROE in Alma Market S.A. during the years 2012–2015**

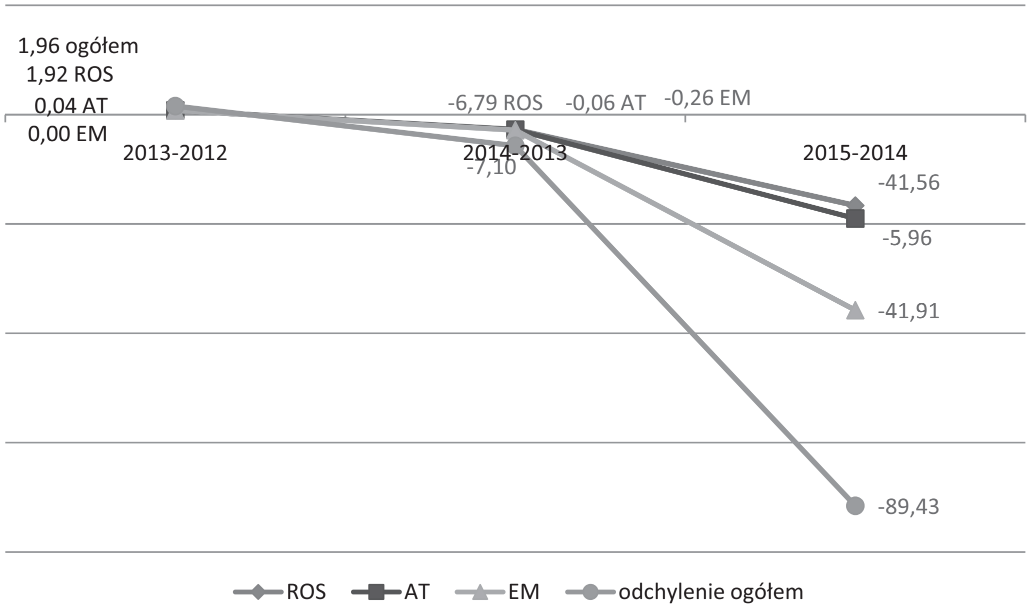

Chart 3: **Partial and total deviation in the causal analysis of the ROE for Alma Market S.A. during the years 2012–2015**

During the subsequent years, there were some unfavourable changes, and they would require some more detailed analysis; all the profitability ratios are negative (*Chart 1*).

In 2014 there was a decrease in the ROE by 7.10 p.p.; the deviation of the ratio resulted from:

– a drop in the ROS by 1.64 p.p. (*Table 2*, the difference between the results achieved in 2014 and 2013); it resulted in a drop in the ROE by 6.79 p.p. (Table 3); the change in the ROS explains over 95% of the total deviation (6,79/7,10×100);
– an increase in the AT by 0.023 (Table 2, the difference as mentioned above); although the change is positive, and it means that the assets generate some more sales revenue, the total deviation is unfavourable, considering a negative change in the ROS, and it results in the drop in the ROE by 0.06 p.p. The combined change in the ROS and AT explains 0.85% of the total deviation (0,06/7,10×100), and it turns out to be insignificant for its evaluation.
– an increase in the multiplier of the equity capital by 0.16 (Table 2, the difference 2,63207 – 2,47231). Considering an increase in the AT and a drop in the ROS, the ROE decreased by 0.26 p.p. (Table 3).

The total share of the partial deviation in the total deviation reaches the approximate level of 3.7%.

As the analysis of the ROE changes during the years 2013–2014 suggests, the fundamental reason is the decrease in sales revenue.

Compared to 2014, in 2015 there was a dramatic decline in the ROE ratio: by 89.43%; it means that for each 100 units of equity capital there were 89 fewer units of profit than in the previous time periods. The ROE is negative (*Chart 1*) and its drop results from:

– deeper worsening of the sales revenues (ROS) from the level of -0.96 to -10.26 (*Table 2*); the costs of the company have exceeded its revenues. Such a situation generates loss and, as a result, the ROE has decreased by 41.56 p.p. (Table 3). It means that the investors have lost 41.56 units of profit per each 100 units of equity capital because of the wrong development of costs and margins. The partial deviation of the ROS explains almost a half of the ROE deviation (41,56/89,43×100 = 46,47%);
– a positive increase in the AT, although it has not managed to counterbalance the results of the ROS decrease. The assets of the company generate growing revenues (an increase from 1.70 to 1.92 units of the revenue, *Table 2*). It means that the assets are of high quality, and it indicates that the assets are managed in a proper way. However, considering the drop in the sales revenues, the partial deviation is negative, and it increases the total deviation by 5.96 p.p. (*Table 3*), explaining it in almost 7% (5,96/89,3×100);

– a significant increase in the EM and some stronger use of the financial leverage. Combined with the increase in the AT and the decrease in the ROS, the fact has induced a negative reaction of the ROE (a drop by 41.91 p.p.). The change in the structure of financing in the situation when the financial results are negative, can explain almost 47% of the total deviation.

Conclusions. Despite the increase in the cheapest source of financing (short-term liabilities) to the level which disturbs financial liquidity, the expected increase in the ROE ratio has not taken place. Understanding the ROE as a result of the performance of three elements (ROS, AT, EM), it is possible to evaluate its changes in the relation to the change in the structure of financing, productivity of assets and sales profitability.

Hence, no objections being made as to the management of the assets (growing productivity of the AT), it should be noticed that the risk connected with running the company into debt is growing, and the current effect of the financial leverage is unfavourable (so called a financial bludgeon) – it has contributed to the loss of profits by investors to the very same extent as the decrease in the ROS.

The drop in the ROS requires the company to take up some resolute actions to limit the costs, however the drop has been reinforced by improper development of the capital structure. It indicates that the ROE has not been modelled. There has not been an explicit answer that could explain the relation of problems pertaining to the liquidity and profitability of the analysed company. It may indicate their individual and differentiated background.

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