

## THE OPTIMIZATION OF THE ENTERPRISE FINANCIAL ANALYSIS THROUGH THE FINANCIAL SYSTEM OF CONTROL DU PONT

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**Abstract:** *The return on assets and the return on equity are essential indicators for the assessment of the company performance. They have a rich financial content, but there are many cases where the figure sometimes shows a “prettier” reality. In such cases it is necessary to treat and interpret financial rates with caution, taking into account, at the same time, other methods used in the financial analysis. The objective of this paper is to present a popular financial diagnosis optimization method - the Du Pont financial control system, that has an important role in the financial analysis of the company because it is related to the return on assets and the return on equity of the company as a result of the interaction of several factors synthesized through reports built based on information taken from the annual financial statements.*

**Keywords:** *financial diagnosis, financial performance, economic rate of return, financial rate of return;*

**JEL Clasification:** *G01, G10, M10, M20*

### 1. Introduction

One of the significant characteristics of the economic and financial rates of return is the possibility to break it down on influencing factors, synthesized by means of certain financial ratios. This breakdown is made through the so-called Du Pont financial control system, named after the famous American company that “patented” this financial analysis technique.

The return on assets ROA and the return on equity ROE are indicators that highlight the contribution of each funding source to the overall efficiency of the company. I analysed, in this paper, and I commented upon methods of expressing rates of return, highlighting their role within the financial analysis. A popular method of optimising company performance diagnosis is to break down rates of return based on the Du Pont financial control system.

The research method used to prepare this paper implies the theoretic substantiation of notions specific to company performance, in agreement with the opinions expressed in the specialized literature.

For the preparation of this paper we used as documentary material data and information sources provided by the profit and loss account, which is the most important annual financial statement part, used with the purpose of assessing the financial performance of the company.

### 2. Research results

The Du Pont financial control system starts from the idea that the return on assets and the return on equity of the company represent the result of the interaction of several factors synthesized through reports built based on information from the balance sheet and the profit and loss account.

According to this methodology, the return on assets ROA can be formulated as the product between a margin rate (the share of the net operating result in the turnover) and a capital turnover rate (the ratio between the turnover and the average economic assets). The purpose of this breakdown is to highlight the factors that influence the return on assets, since one is a quantitative factor (the margin rate, which shows what share of the turnover the company manages to retain as operational profit) and the other is a qualitative one (the turnover rate, which allows for assessing the efficiency with which the company uses its economic capital).

Thus, according to the Du Pont system, the return on assets of the company can be expressed as the product of two financial rates: a margin rate and a capital turnover ratio [4].

The margin rate indicates the value structure of the turnover by means of the ratio between the net operating profit and the turnover. Marking this margin rate as RM, the calculation formula is as follows:

$$RM = \frac{EBIT_1 \cdot (1 - t)}{CA_1} \quad (1),$$

where:

- $EBIT_1$  = the operating result corresponding to the current accounting period;
- $CA_1$  = turnover obtained in the current year.

The capital turnover rate is determined by relating the turnover to the economic assets of the company. Although there is no consensus among the specialists in relation to the time moment at which the two indicators should be considered, in order to ensure the consistency and reliability of the results generated by the financial analysis, it is useful to take into account the turnover of the current accounting period and the average economic assets for the last two accounting periods. This option is justified by the fact that both the economic assets controlled by the company at the end of the previous year, as well as the potential changes of these assets during the current accounting period contribute to the achievement of the current turnover. Marking the capital turnover rate with RR, we will have:

$$RR = \frac{CA_1}{AEM} = \frac{CA_1}{\frac{AE_1 + AE_0}{2}} \quad (2)$$

The return on assets ROA can be expressed as product between the margin rate and the capital turnover rate:

$$ROA = RM \times RR = \frac{EBIT_1 \cdot (1-t)}{CA_1} \cdot \frac{CA_1}{AEM} \quad (3)$$

This formula is known in the financial theory as the **Du Pont equation of the return on assets** [1]. This calculation formula of ROA does not take into account the tax saved as a result if the deductibility of the expenses with interests for the determination of the taxable profit.

According to the Du Pont equation, in order to increase the return on assets of the company, it is necessary to increase the margin rate and/or the capital turnover rate.

The first situation implies the capacity of the company to increase selling prices of its products and/or services provided while keeping expenses constant or diminishing them, which is only possible in the case of the companies with a privileged position in the market (monopole), a case that is increasingly rare in the modern market economies.

The second situation, of the ROA increase due to the qualitative factors, implies the increase in the efficiency of the use of the economic capital and reflects, among others, the extent to which the company integrates technical progress in its activity and its capacity to adjust to the changing conditions of the market.

The margin and capital turnover rates can be viewed tools of the financial strategy developed by the company management. In order to illustrate this statement, we can provide the example of a company aiming to expand its client portfolio by offering flexible commercial credit conditions. This measure will lead to the decrease of the capital turnover rate (as a result of the faster increase of clients' debts compared to the company sales). Thus, in order to prevent the decrease of ROA, the company management must increase the margin rate.

Some authors in the field [5], [6], analysing the options available to the managers of a company in order to increase the company's return on assets, highlight the fact that many companies resort to the vertical integration, by acquiring a supplying company or a company that distributes its products, the so-called "sales outlets, hoping to increase its margin rates. This strategy might not generate the expected effects if the company management does not have the ability to lead and manage this new business: the most frequent scenario is that the margin rate increase is cancelled by the reduction of the economic asset turnover ratio.

An interesting idea is the fact that, in the developing periods of the company, they can record a more rapid increase of the economic capital invested compared to the rate of return of the company; thus, despite the increase in the margin rate, a decrease of the ROA may occur.

According to the breakdown equation of the economic rate of return, the same value of the ROA can be the result of two different approaches: on the one hand, a low price policy (and implicitly, modest values of the margin rate), because the company management counts on a higher capital turnover speed and, on the other hand, a high price policy (and significant values of the accumulation margins), accompanied, however, by a slow turnover of the assets through the turnover of the company.

If ROA is reduced, the company management could act in the following directions:

- To increase the margin on the value added (in compliance with the aspects discussed hereinabove);
- To improve the efficiency of the operating assets, either by revamping production capacities, or by a more efficient use of the existing ones. However, we should keep in mind that both solutions presented involve significant expenses (in the first case, for example, for purchasing new machinery and equipment, and in the second case, for staff refreshing), whose impact on the operating result cannot be neglected [2];
- To increase the average level of fixed economic assets, by investing in new equipment and/or by diminishing the balance of certain balance sheet items such as receivables (increasing the efficiency of collecting arrears) and stocks (more specifically increasing their turnover rate). This measure is qualitative and is obviously the most accessible of all solutions available to the company management.

According to the same Du Pont system, the return on assets ROE can be broken down as the product of three financial rates: a net margin rate (the profit net share in the turnover of the company), a total asset turnover rate (the ratio between the turnover of the company and the total asset average of the company in the last two years) and the multiplier of equity capitals (the ratio between the total average assets and the average equity). Of course, such a breakdown of ROE on influencing factors is a refinement of the financial analysis technique and allows for issuing value judgements.

Similarly, for the breakdown equation of the return on assets (ROA), the Du Pont system established the following factorization method of the rate on equity (ROE):

$$ROE = \frac{PN_1}{CA_1} \cdot \frac{CA_1}{CPRM} = \frac{PN_1}{CA_1} \cdot \frac{CA_1}{\frac{CPR_1 + CPR_0}{2}} = RMN \times RRCPR \quad (4),$$

where:

- the  $PN_1/CA_1$  ratio represents the net accumulation margin rate (RMN) or the profit rate, which indicator shows the share of the total sales the company accounts for as net result of the accounting period;
- the  $CA_1/CPRM$  ratio an equity turnover rate (RRCPR) and expresses the rate at which the turnover made by the company ensures the renewal of its equity.

Considering the following breakdown of the equity turnover rate:

$$RRCPR = \frac{CA_1}{AEM} \cdot \frac{AEM}{CPRM} = RR \times RSC \quad (5),$$

where RSC is the capital structure rate, the formula above can be changed as follows:

$$ROE = \frac{PN_1}{CA_1} \cdot \frac{CA_1}{AEM} \cdot \frac{AEM}{CPRM} = RMN \times RR \times RSC \quad (6)$$

A slightly changed version of formula (6) was proposed, with the purpose of highlighting the impact of the financial leverage on equity:

$$ROE = \frac{PN_1}{CA_1} \cdot \frac{CA_1}{ATM} \cdot \frac{ATM}{CPRM} = RMN \times RRAT \times LF \quad (7),$$

which means that the return on equity of the company is the result of three components:

- a. the profit to turnover ratio (RMN), indicator expressing the performance of the operating activity of the company;
- b. the share of the company turnover made in the current accounting period in the total average assets or *the total assets turnover rate* (RRAT), allowing for the assessment of the investment activity of the company through the company assets renewal duration;
- c. the ratio between the total average assets and the average equity value, expressing the financial leverage (LF) or the equity multiplier. This indicator expresses the level of the company assets as a multiple value of the equity and reflects the funding activity of the company.

The equality (7) is known as **the expanded Du Pont equation**. This formula can be extended as follows:

$$ROE = \frac{PN_1}{CA_1} \cdot \frac{CA_1}{ATM} \cdot \left( 1 + \frac{1}{\frac{CPRM}{ATM}} \right) = \frac{PN_1}{CA_1} \cdot \frac{CA_1}{ATM} \cdot \left( 1 + \frac{1}{1 - \frac{DM}{CPRM}} \right) = RMN \times RRAT \times \left( 1 + \frac{1}{1 - GMI} \right) \quad (8),$$

where DM represents the total average debts of the company (not the ones bearing interest, i.e.  $DM = AT - CPR$ ) on the last two accounting years, and GMI is *the overall average indebtedness degree*, calculated as a ratio between the average debts and the average equity.

This last formula is another proof of the apparently surprising fact that the financial profitability of a company can grow with its indebtedness degree. For a rigorous mathematical justification of this statement it is necessary to calculate the partial derivative of the ROE function in relation to GMI:

$$\frac{\partial \text{ROE}}{\partial \text{GMI}} = \text{RMN} \times \text{RRAT} \times \frac{1}{(1 - \text{GMI})^2} > 0,$$

which shows that there is a **direct** relationship between ROE and GMI.

Nevertheless, we should not omit the fact that an increase in the indebtedness degree results not only in an increase in ROE, but also in a corresponding increase in the financial risk associated to the business in question.

The expanded Du Pont equation can be broken down as follows:

$$\text{ROE} = \frac{\text{PN}_1}{\text{CA}_1} \cdot \frac{\text{CA}_1}{\text{AEM}} \cdot \frac{\text{AEM}}{\text{CPRM}} = \frac{\text{EBIT}_1 \cdot (1 - t) + \text{DOB} \cdot t}{\text{CA}_1} \cdot \frac{\text{CA}_1}{\text{AEM}} \cdot \frac{\text{AEM}}{\text{CPRM}} \cdot \frac{\text{PN}_1}{\text{EBIT}_1 \cdot (1 - t) + \text{DOB} \cdot t}$$

$$\text{ROE} = \text{RM} \times \text{RR} \times \text{RSC} \times \text{RSR} \quad (9),$$

where:

RSR is the remuneration structure rate, which is expressed as the share of the net operating result accounted for by the company as net profit.

Taking into account that the return on assets can be written as  $\text{ROA} = \text{RM} \times \text{RR}$ , we will conclude that the return on equity is equal to the product between the return on assets, the capital structure rate and the remuneration structure rate:

$$\text{ROE} = \text{ROA} \times \text{RSC} \times \text{RSR} \quad (10),$$

where the product between RSC and RSR is a measure of the financial leverage.

The Du Pont financial dashboard represents a graphical method of financial analysis developed by the same company in the American chemical industry and which subsequently became very popular in the company finance practice [3]. This analysis method is based on the following breakdown of the return on equity (ROE):

$$\text{ROE} = \text{ROA}^{**} \cdot \frac{\text{ATM}}{\text{CPRM}} \quad (11),$$

where  $\text{ROA}^{**}$  is the return on assets calculated using the formula:

$$\text{ROA}^{**} = \frac{\text{PN}_1}{\text{ATM}} \quad (12)$$

Subsequently,  $\text{ROA}^{**}$  is broken down according to the Du Pont equation:

$$\text{ROA}^{**} = \frac{\text{PN}_1}{\text{CA}_1} \cdot \frac{\text{CA}_1}{\text{ATM}} = \text{RMN} \times \text{RRAT} \quad (13),$$

then the Du Pont dashboard proposes highlighting each (main) category of incomes and expenses incurred by the company separately (which are deducted from the sales volume in order to obtain the net profit), which will allow for the identification of the causes of the possible inappropriate evolution of the margin rate (RMN). The Du Pont dashboard also comprises the categories of assets controlled by the company.

### 3. Conclusions

This paper was prepared in such a way as to highlight the role of the return on assets and the return on equity in the assessment of company performance.

Certainly, the return on assets and the return on equity represent essential indicators for the assessment of the

company performance. However, in order to carry out a pertinent financial analysis, I recommend the cautious interpretation of the indicators, because there are many cases where numbers show a “more beautiful” reality when, for example, the significant stock variation artificially increased the operating incomes of the company.

I also recommend the simultaneous analysis of the two indicators, because they have an informative value only if they are considered together: o a very high return on equity can be accompanied by a low return on assets, is the company manly relies on debts as financing sources.

The optimization of the financial analysis techniques implies, in my opinion, the study of the rates of return together with the analysis of the equity turnover rate, viewed as the qualitative indicators for the assessment of the efficiency of the company activity. The turnover rates should be calculated for the representative items of the current assets and liabilities of the company, more specifically stocks, receivables, debts to suppliers (basically, those items that have a decisive impact on the need for working capital), and also for the operating fixed assets of the company.

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