

ADVANTAGES AND LIMITATIONS OF THE FINANCIAL RATIOS USED IN THE FINANCIAL DIAGNOSIS OF THE ENTERPRISE

Mihaela GÂDOIU¹

Faculty of Economics, University of Pitești, mihaela_gadoiu@yahoo.com

Abstract: *This paper points out the importance of the financial ratios used in financial diagnosis. Starting from the idea that the financial theory and practice use too many indicators to achieve the financial diagnosis of a company, and that most of the instruments used are relevant only under specific and limited conditions, we examined the advantages and limitations of the financial ratios. The research method used in this paper involves on the one hand, the theoretical substantiation of the specific notions used in financial diagnosis of an enterprise, and on the other hand their transposition by appealing to an example of the use of a company.*

Keywords: *financial diagnosis, financial ratios, performance*

JEL Classification Codes: G11, G12, L21

1. INTRODUCTION

The profitability rates show the efficiency of a company as a ratio between the resulted effects (benefits) and the efforts to achieve them. The corporate finance theory established two relative measures of profitability, the *return on assets* and the *return on equity*, whose actual size and influence are used in diagnosing the profitability of a company (Stancu, 2007, p. 705).

Considering the present computing technology, many analysts are tempted to calculate a larger number of indicators than necessary. In general, only a small part of them are really useful in the financial diagnosis of a company (Bondoc D., Țăicu M., 2013, p. 9-10).

Also, the profitability rates of a company are not absolute criteria of evaluation, they only provide valuable information in combination with other indicators that highlight the changes in operation and financing over several periods and compared with other companies on the respective market (Helfert, 2001, p.96).

2. THE RATIOS OF RETURN ON ASSETS

The *return on assets (ROA)* is a measure frequently used to evaluate the performance of an enterprise and results by reporting the net profit (various forms) of a company to the value of assets used to generate that profit. It is interesting to note that there is no consensus among experts on calculating ROA, their views being divided. We are presenting the most common means of evaluating the return on assets of a company.

Some authors suggest to calculate the return on assets as the ratio between the net profit (NP) of a company and the average total assets of the last two accounting years (Helfert, 2001, p.112-p.113):

$$ROA = \frac{NP}{ATA} \quad (1),$$

The average total assets (ATA) is calculated by the following formula:

¹ Lecturer PhD.

$$ATA = \frac{TA_1 + TA_0}{2} \quad (2),$$

where TA_1 represents the total assets at the end of the current financial year (for which ROA is calculated) and TA_0 is the value of assets at the end of the previous year.

The author states that in determining the return on assets of a company, one may use the *economic assets* instead of the total assets (the right denominator of ratio (1)). The *economic assets*, also known as the *economic capital*, represents the capital invested in the company and it is the part of total assets not financed by operation debts (mainly the debts to suppliers). Therefore, the economic capital of the enterprise groups those asset items funded from sources that the company has to remunerate (equity assigned by shareholders and short-term, medium and long term loans, contracted from various creditors):

$$EA = TA - CDWI \quad (3),$$

where: EA = the economic assets of a company and

CDWI represents its *current debts without interests*.

Using the economic assets instead of total assets is justified by the fact that the operational debts of the company represent available free funding sources to support a part of the current assets of the company. Therefore, the return on assets may be interpreted as the net asset profitability (of the invested capital) and is calculated using the following formula:

$$RONA = \frac{PN}{AEA} \quad (4),$$

where:

- RONA = return on net assets;
- AEA = average economic assets.

Certainly, the methodology for calculating this indicator is formally identical to that given by (2):

$$AEA = \frac{AEA_1 + AEA_0}{2} \quad (5),$$

in which:

- AEA1 = economic assets (net assets) of the company at the end of the current year;
- AEA0 = economic assets (net assets) of the company at the end of the previous year.

The average total assets or the average economic assets are recommended because the results achieved by a company during a financial year are determined by the capitals it has at the end of the previous year, and the additional capital invested in the current year (Brealey and Myers, 2003, p. 828). Despite this evidence, the experts have not reached an agreement on the exact moment the assets of the company should be considered; some support the (total or net) assets from the beginning of the year, while others, surprisingly, recommend the values at the end of the current year (Stancu, 2007, p.757). As for me, I find entitled the compromise solution of considering the average values.

Other authors consider that the return on assets should be calculated in two forms (Ross-Westerfield-Jaffe, 2002, p.37):

- *the gross return on assets* (GROA) is determined as the ratio between the earnings before income tax (EBIT) and the average total assets (ATA) of the company for the last two financial years:

$$GROA = \frac{EBIT}{ATA} \quad (6)$$

- *the net return on assets* (NROA) is calculated by reporting the net profit of the financial year to the average total assets. In this case, the calculation of ROA is the same as the equation (1) proposed by Helfert (2001).

The return on assets is an indicator that measures the ability of the company to ensure through its results (earnings before income tax EBIT or net profit, according to the method of calculation of ROA considered), renewal and payment of its assets (or economic assets). The return on assets may be considered an internal rate of return (regarded as a set of old and new investments) that if higher than the cost of capital indicates a higher value of the company (Stancu, 2007, p. 759).

The return on assets may be defined by the ratio between the net operating profit and the value of the economic assets at the beginning of the current financial year:

$$ROA = \frac{EBIT \cdot (1-t)}{EA_0} \quad (7)$$

Another interesting opinion considers appropriate to calculate the return on assets in both gross and net ways, similar to that proposed by Ross-Westerfield-Jaffe (Vintilă, 2005, p.193-p.194). The calculation formulas are as follows:

$$GROA = \frac{EBE}{GEA_0} \quad (8)$$

$$NROA = \frac{EBIT}{NEA_0} \quad (9),$$

where:

- GROA = gross return on assets;
- NROA= net return on assets;
- GEA_0 = gross economic assets (including depreciation) at the beginning of the financial year;
- NEA_0 = net economic assets at the beginning of the financial year.

The difference between gross and net return on assets is important because the first one is not affected by the depreciation policy of the company and it is therefore useful in comparing different companies that belong (or not) to the same sector. The gross return on assets may also be regarded as a measure of efficiency in which the company uses its economic capital, an efficiency resulting in proper remuneration and quick renewal.

The return on assets has to be higher than inflation so that the company keeps the value of its economic assets. We may introduce the concept of *rate of real return on assets*, which is calculated by removing the impact of inflation on the nominal rate ROA. The calculation formula is given by the well-known Fisher's formula:

$$1 + ROAR = \frac{1 + ROA}{1 + i} \quad (10),$$

where ROAR represents the real return on assets, and i is the inflation rate. Processing the previous relation, we get the following expression of the ROAR:

$$ROAR = \frac{ROA - i}{1 + i} \quad (11)$$

If inflation values are below 10%, one may use the following approximation in calculating the real rate of return on assets of the company:

$$ROAR \approx ROA - i \quad (12)$$

Finally, other authors suggest that return on assets should be calculated by reporting the net operating profit to the average economic asset, according to the following formula (Brealey and Myers, 2003, p.828):

$$ROA = \frac{EBIT \cdot (1-t)}{AEA} \quad (13)$$

Note that the return on assets of an enterprise must be calculated differently depending on its capital structure. Equation (13) is valid for companies financed entirely from equity (leveraged zero). For other companies, the calculation of return on assets must take into account the tax savings resulting from interest tax shields:

$$ROA = \frac{EBIT \cdot (1-t) + ITS \cdot t}{AEA} \quad (14),$$

where ITS represents the interest tax shields.

An indisputable advantage of the relation (14) is that it gives the possibility to make comparisons between companies with different financing policies, because it eliminates the impact cost of borrowed capital. Also, equation (14) shows that among two companies that obtain the same earnings before income tax (EBIT) and the same average economic assets, the heavily indebted one will have a higher ROA (Brealey and Myers, 2003, p.828):

$$\frac{EBIT \cdot (1-t) + ITS \cdot t}{AEA} > \frac{EBIT \cdot (1-t)}{AEA}$$

I consider appropriate the use of relation (13) to calculate the return on assets (and, respectively, its variant (14) for indebted companies), because it shows the company's ability to use profitably assets in its operation, in order to reward and renew its economic assets. I also recommend to use the average economic assets instead of the average total assets, because the first one shows how management directs the funds to be paid (long-term debts, current bank loans, etc.).

My option for the calculation formulas mentioned above is also based on the fact that they emphasize the operating performance of the company which, as I argued above, should be the basis for profit. When using the relation (1), whose reference is the company's net profit, one may be misleading: a serious operation deficit may be "dressed up" artificially by a very good financial result, and the return on assets may suggest a better return than it really is.

Now I would like to move on and calculate the return on assets (ROA) for a company, according to the equation (14), as this company is indebted. Before that, I am going to evaluate the economic assets of the company, using the following table:

Table 1. Determining the economic assets for the company in the period 2010 – 2013

YEAR	2010	2011	2012	2013
Total assets (TA)	496,842,468	476,098,503	523,653,396	610,697,694
Current debts without interest ² (CDWI)	63,558,299	77,825,392	72,129,980	45,494,830
Economic assets (EA)	433,284,169	398,273,111	451,523,416	565,202,864
Average economic assets ³ (AEA)	451,931,365	415,778,640	424,898,264	508,363,140

Source: the balance sheets of the company, own calculations. The amounts are expressed in RON.

² Calculated as the difference between total liabilities with maturity less than one year and short-term bank loans.

³ Determined using formula (5).

The necessary information to determine ROA are shown below:

Table 2. Determining the return on assets (ROA) for the company in the period 2010 – 2013

YEAR	2010	2011	2012	2013
Net earnings before income tax (net EBIT)	27,137,713	-11,708,507	13,929,645	80,045,868
Interest tax savings (ITS x t)	1,562,526	1,808,992	1,612,689	513,763
Average economic assets (AEA)	451,931,365	415,778,640	424,898,264	508,363,140
Return on assets (ROA)	6.35%	-2.38%	3.66%	15.85%

Source: own calculations. The amounts are expressed in RON.

The return on assets at company fluctuated considerably over the period of analysis, reducing from 6.35% in 2010 to -2.38% in 2011, and increasing to 3.66% in 2012 and 15.85% in 2013. This means that if in 2010 the operating profit of the company provided the renewal of the economic assets in approx. 16 years, in 2012 this period increased to 27 years and in 2013 dropped to approx. 6 years, while the operating loss recorded in 2011 consumed a part of the economic capital of the company. In 2013, the leap made by the return of assets was due to a better overall operating performance, making a profit that balanced the supplementary financing need, generated by increasing stocks. The values of ROA in 2010 and 2012 may be considered normal for the Romanian economy, since the renewal of assets is slower compared to the mature Western economies (Vintilă, 2005 p.194).

3. THE RATIOS OF RETURN ON EQUITY

The rate of return on equity (ROE) is a quantification in relative terms of the return on equity of the company, meaning the shareholders' placement who entrusted the respective capitals. As in case of return on assets, the authors' views are also divided in defining this indicator.

Brigham and Ehrhardt (2002, p.381), Friedlob and Schleifer (2003, p.2003), Stancu (2007, p.760) and Vintilă (2005, p.199) propose to determine the return on equity as the ratio between the net result for the financial year and equities of the company at the end of the previous year:

$$ROE = \frac{NP_1}{E_0} \quad (18)$$

On the other hand, as I argued in the analysis of the return on assets, in case of the return on equity we should consider that the net result of the current financial year is achieved by using both the available equity at the end of the previous year and the additional ones invested during the current year. Therefore, Helfert (2001), Brealey and Myers (2003), and Ross-Westerfield-Jaffe (2002) recommend to calculate the return on assets by dividing the net result by the average equity of the company:

$$ROE = \frac{NP}{AE} \quad (19),$$

where AE is the simple arithmetic average of the equity of the company for the last two financial years, respectively

$$AE = \frac{E_1 + E_0}{2} \quad (20)$$

Regardless of the method of calculating the return on equity, we have to state that this indicator is a relevant measure of management efficiency in dealing with shareholders' capital.

This efficiency refers to the company's ability to remunerate equity (by dividends paid to shareholders) and to increase their value over time by making a profit that would reduce the company's debts, but rather making investments from its own resources to produce economic value added.

I mention that as far as I am concerned, I consider the relation (19) to be appropriate in calculating the return on assets, as it shows company's return on equity according to the management vision on using such capital and the changes occurring in their structure and volume.

ROE calculation for the company is shown below:

Table 3. Determining ROE for the company in the period 2010 – 2013

YEAR	2010	2011	2012	2013
Net result of the current financial year (NP)	17,173,683	-1,036,756	55,614,476	50,540,752
Average equity (AE)	257,455,645	265,524,108	302,820,913	365,906,472
Return on equity (ROE)	6.67%	-0.39%	18.37%	13.81%

Source: the balance sheets and profit and loss accounts of the company in the period 2010 - 2013, own calculations. The amounts are expressed in RON.

The results in the table shows a modest net profit of the company compared to the equity value in 2010, leading to a financial rate of return on equity of only 6.67%. In 2011, the massive operating deficit, though covered mostly by good financial performance, could not prevent the company to record a loss, generating a negative return on equity of -0.39%, which means that the overall activity of the company used a part of its equity. The year 2012 was the most profitable in terms of both operation and financial activity, while the net profit of over 55 million RON resulted in 18.37% return on equity. In 2013, the net profit was lower (yet very good, 50.54 million RON). These last two values indicate a good potential of the company to distribute dividends and increase its reserves for further profit reinvestment. As the company reduced its dependence on external capital, it managed to improve its profitability, even if the net profit did not keep up with the equity variations in 2012 and 2013.

The financial rates provide undoubtedly valuable information on the activity of a company and its financial position. However, the analysis on financial ratios should be performed carefully and rationally, giving the following reasons (Brigham and Houston, 2008, p.113 -p. 114):

- many large companies have divisions operating on different markets; it is difficult to develop a relevant system of ratios for such companies. Therefore, we recommend to use financial ratios for highly specialized companies;
- the fact that a company achieves "good" performances is not enough. The ratio values should always be compared with the values reported by the market leaders, to see exactly where the company stands⁴;
- inflation may induce major distortions in the analysis; therefore, when performing multiannual financial analyses, it is important that the results be interpreted considering inflation;
- the seasonal factors may also influence the analysis of the financial ratios. Therefore, it is necessary to make adjustments that minimize the impact of seasonality;
- as the financial practice demonstrates, many companies resort to subterfuges that allow them to veil artificially their situation, making the ratios look better than they really are⁵.

⁴ In practice, this process is called benchmarking.

Let us consider the following simple example: at the end of a financial year, just before the end of the reporting period, a company takes a short-term loan, keeps the money as available funds, and at the beginning of the next year, the company repay the loan. This stratagem is designed to improve apparently the company's liquidity situation, although there is no real change in this respect;

- the various accounting methods and techniques (such as those used in inventory management and calculation of depreciation of fixed assets) may complicate comparisons between the companies' financial ratios. Another problem arises from the fact that many companies prefer to use leased equipment, which has two consequences: first, often these assets do not appear on the balance sheet, and the amount of assets may be low compared to the turnover (and therefore the rotation of fixed assets accelerates) and secondly, the lease obligations may not be recorded in the balance sheet as debt, which "improves" the capital structure of the company;
- It is often difficult to say whether the values of the financial ratios are "good" or "bad". For example, a high rate of current liquidity may show a good capacity of the company to meet short-term obligations; but it also may be the consequence of holding too much cash in the house and / or current bank accounts, which is not recommended, since excessive cash means unproductive assets. Similarly, a rapid rotation of operation assets through turnover may have a positive connotation (the company uses its fixed assets efficiently) or, on the contrary, a negative one (the company is undercapitalized and cannot afford to purchase other assets);
- a company may have some financial ratios that look "good" and others that look "bad", which considerably hampers the evaluation of the overall situation of the company. Therefore, it is recommended to use statistical procedures in determining the importance of indicators and the accurate classification of companies.

The quantitative analysis on financial ratios to be accompanied by a qualitative analysis, factors that may have a strong influence on the company. These qualitative factors were synthesized by the American Association of Individual Investors⁶ and include:

- *customers*. Since the company's revenues depend on a small number of customers, then the company may face serious problems if these customers are turning to competition. On the other hand, if there is a tradition in business relations between the two parties, this factor can stabilize the company's sales;
- *offer diversity*. Although the companies with specialized offers, consisting of a small number of products, may be more effective as a result of specialization, they are exposed to greater risks than firms whose offer is diverse;
- *suppliers*. If the company depends on several suppliers, then it is likely to get into problems when such providers have difficulties;
- *geographical extent of business activity*. As the financial practice shows, the multinational companies often report higher growth rates and profit margins. However, there is the reverse: a significant volume of transactions carried out across national borders means that the company is exposed to significant currency risk. In addition, there is the country risk to be taken into account;
- *competition*. In evaluating opportunities for growth and future performance, the company must take into account both the current competition and the possibility of new competitors in the future;

⁵ In the literature, these procedures are called "window dressing".

⁶ The American Association of Individual Investors (AAII), <http://www.aaii.org>.

- *future prospects of the company*. For example, if a company invests heavily in research and development, its future performance depends directly on the success of the products in the research phase;
- *legislative framework*. It is obvious that the legislative changes may have significant implications for both business environment and company.

4. CONCLUSIONS

An important issue of the analysis based on financial ratios is the overvaluation the rate of return on equity as an indicator of company performance. The fundamental objective of financial management is to maximize the value of the company. Although the return on equity (ROE) and the value of shareholders' property are often highly correlated, there are some problems that occur when ROE is used as the sole measure of performance of a company (Brigham and Ehrhardt, 2002, p. 393 – p.394).

First, ROE does not consider the risk of a company, and the shareholders are interested in the risk associated with investment, more than in its potential benefits.

In order to demonstrate this, let us consider the case of a company which has two subunits, namely A and B. Division A is characterized by an expected return on equity of 15%, but its cash flows are highly volatile, while unit B has an expected ROE of only 12%, but stable cash flows. In this context, the 15% expected variability in cash flows of division A may not materialize, and the real ROE value may be lower than the 12% recorded by division B; this unit may create more value for the shareholders as a result of a lower exposure to risk.

Second, the return on assets is a relative measure of a company's performance, which does not account for the size of the invested capital⁷.

Let us consider a company that has two investment projects under operation: project X of EUR 5,000 and an estimated ROE of 50%, and project Y of EUR 10 million with an expected rate of return on equity of 30%. To simplify, let us assume that both projects have the same degree of risk. It is clear that project X has a higher profitability, but because its value is very small, it creates less value for the shareholders than the latter.

Third, using ROE as a measure of performance and as a reference in determining managers' remuneration, may encourage them to invest in projects with a higher expected return on equity, though they can be very risky. Let us take the example of a company that had a very good year, reporting a value of ROE of 40%, and now it has the opportunity to invest significant capital in a low-risk project with the expected ROE of 28%. The company managers will be reluctant to accept this project, as it would reduce the company's overall financial return on equity, and that would lower their bonuses – despite the fact that the project is very profitable (and, furthermore, its efficiency is significantly higher than the cost of capital), the risk is low, and would make a significant contribution to the value of investments made by the owners of the company.

These examples demonstrate that the decision to use ROE as the sole measure of profitability may be a fundamental error.

In order to optimize the financial analysis, it is recommended to perform ROE analysis in parallel with a study of risks regarding the return of assets, an indicator showing the company's relative profitability to its size. Also, a viable alternative is the use of other performance indicators such as the added economic value.

⁷ Brigham and Houston (2008), p. 116.

REFERENCES

1. Brealey R., Myers S., *Principles of corporate finance*, The McGraw-Hill Companies, 2003
2. Brealey R., Myers S., *Financing and risk management*, The McGraw-Hill Companies, 2002
3. Bondoc M. D., Taicu M., *Expenses analysis based on information provided by the profit and loss account – company performance diagnosis stage*, Annals of the University of Petroșani, Economics, 13(1), 2013, p.5-p.14
4. Brigham E., Ehrhardt M., *Financial management: theory and practice*, South-Western College Pub, 2002
5. Brigham E., Houston J., *Fundamentals of financial management*, South-Western College Pub, 2008
6. Dragotă V. (coord.), *Financial management, Volume II: corporate financial policies*, Economic Publishing House, Bucharest, 2002
7. Friedlob G., Schleifer L., *Essentials of financial analysis*, Wiley, 2003
8. Helfert E., *Financial analysis tools and techniques – a guide for managers*, The McGraw-Hill Companies, 2001
9. Ross, S., Westerfield R., Jaffe, J., *Corporate finance*, McGraw-Hill/Irwin, 2002
10. Petrescu S., *Financial and accounting analysis and diagnosis – Theoretical and Practical Guide -*, CECCAR Publishing House, Bucharest, 2006
11. Stancu I., *Finances*, 4th Edition, Economic Publishing House, Bucharest, 2007
12. Stroe R., Armeanu D., *Finances*, AES Publishing House, 2004
13. Vasile I., *Financial management of the enterprise*, Meteor Press Publishing House, Bucharest, 2006
14. Vasile I., Ghinea M., *The financial situation of the enterprise*, Economic Tribune Magazine, V.19, No.8/ 2008
15. Vintilă G., *Financial management of the enterprise*, Didactic and Pedagogic Publishing House, Bucharest, 2005