THE WAY TO INCREASE INFORMATION CAPACITY OF FINANCIAL STATEMENTS

Andrey Tonkikh, PhD
Mariya Makarova
Anton Ostaltsev
Izhevsk State Technical University named after M.T. Kalashnikov, Russia

Abstract
     The article suggests an approach designed to increase the effectiveness of financial statement analysis, as one of the main tools of corporate management. The authors define the disadvantages of existing methods and propose characteristics necessary for an effective decision supporting tool. The method of reference trends is shown to meet the preset requirements, which is proved by a supporting example.

Keywords: Standard dynamics of indices

Introduction

     The efficiency of managerial decisions is based on analysis of available information. Thus, the quality of information defines the quality of decision-making.

     The most common source of information is official financial statements, which can be explained in many ways. First, they are a concise way of displaying information about assets, possible risks and operating results of a company. Second, financial statements are in general freely available. Third, the methods of their analyses are relatively well elaborated. Fourth, the credibility of financial reporting is provided by authorized organizations, such as auditing firms (which however can be argued and suggests an area for further investigation). Yet, financial statements are mostly considered as a reliable source of information. Fifth, they represent an overall performance of a company in terms of the types of its activities, from innovations to human resources management. The financial results of a company sooner or later reflect the success of its management in different spheres (e.g. marketing, production, human resources and innovations) by increasing profits, sales growth and cost reduction.

     Thus, financial statement analysis is one of the main tools of corporate management. The financial indicators used in analysis may vary

depending on the specific needs of a company. Managerial decisions made according to the indicators allow a company to significantly reduce the level of uncertainty in terms of their possible consequences, whereas decisions based on subjective judgment increase the level of risk. The higher the level of uncertainty, the less manageability there is. Generally, management is reasonable only if its results can be described by appointed indicators (increased profits, increased sales, etc.).

The judgment of a company's performance is based on evaluation of accomplished results in relation to normative indicators (which can be set in different ways). The results are usually compared with those of main competitors, absolute standards or an industry average. Having detected any differences, a manager seeks to discover the reasons and takes measures to eliminate weak points.

Main Text:

There are several methods which are commonly used in financial statement analysis and outgoing indicators.

1. Horizontal analysis. It examines the dynamics of particular indicators, based on the calculation of their growth rates. The indicators of the current period are compared either to those of the previous period or with those of several periods in the past.

The main advantage of the method is that it allows one to identify the trend for indicators that describe particular spheres of a company's activity. It gives the possibility both for retrospective analysis and extrapolation of the trend, reducing the level of uncertainty in the future. However, the traditional method has a significant disadvantage. The set of indicators used in the analysis does not take into account the interconnectivity of their trends.

Here is an example that represents the growth rates of sales, assets and profits of a company for the three previous years (Table 1).

Table 1. Growth Rates of Particular Indicators Measuring a Company's Performance

Indicator	Rates of growth, %		
	Year 1	Year 2	Year 3
Sales	105	106	117
Total Assets	102	108	120
Net Profit	110	112	115

At first glance the results displayed this way are likely to create positive image of a company's recent performance and moreover, can be interpreted as a rising trend. The growth rates cannot help but confirm this interpretation, since they increase from one year to the next.

However, the table can be simply modified by transforming the growth rates into their ranks in descending order. This ranking shows which indicator grows faster and which of them grows more slowly (Table 2).

Table 2. Growth Rates Ranking

Indicator	Growth rates ranking		
	Year 1	Year 2	Year 3
Sales	2	3	2
Total Assets	3	2	1
Net Profit	1	1	3

There is a widely accepted "rule" in financial analysis suggesting that growth rates of profits should be higher than those of sales, which, in their turn, should be higher than those of total assets. Let us call it "the rule of trends." Taking this into account, it is obvious without any additional calculations, that despite constantly accelerating annual growth of the indicators, the company's performance in Year two went down and became even worse in Year three.

The example is simplified, but it highlights the core of the problem, not to mention the fact that in practice the analysis takes into account a lot more indicators, the dynamics of which is often different from the recommended one.

  2.   Vertical analysis. It examines the relative weights of aggregated financial indicators (e.g. assets, capital, cash flows). This analysis allows a manager to evaluate the quality of a company's balance structure and to determine the origin of generated cash flows. Yet one should remember that there are no common requirements for the structure of the indicators mentioned above. What is good for one company is not necessarily enough for another. For instance, a highly indebted company might generate significant profits thanks to efficient usage of external resources, while another company may not bear the same level of gearing. So, vertical analysis doesn't give a decisive judgment about a company's performance, which reduces its information capacity.

  3.   Comparative analysis. It measures a company's results in relation to those of its main competitors, absolute standards or an industry average.

This type of analysis provides data   about a company's competitiveness, provides benchmarks and gives the opportunity to compare several companies. However, one cannot avoid certain pitfalls even here.

First, the appropriateness of the chosen benchmarks might be questioned. It is impossible to know for sure how efficient the competitors were. The decisions are not likely to bring forth fruits if they are based on a wrong perception of a competitor's success. Therefore, these benchmarks should not be taken as unquestionable targets. For instance, if during one year the results of company A surpassed those of company B, one might decide that company A was successful. However, this "success" could mean that it is not company A, the results of which have improved, but it is

company B, whose indicators have worsened. So, company   B was so inefficient, that company A could leave it behind. Thus, the analysis based on comparison with either the competitors or an industry average cannot produce relevant information about a company's performance, which does not provide high-quality decision-making.

Second, this approach does not take into account interconnectivity of the trends as "the rule of trends" does. Here is a supporting example. Table 3 compares the results of two particular companies and the industry average.

Table 3. Financial Results of Companies A, B and the Industry Average (Growth Rates, %)

Indicators	Company A	Company B	Industry	Best Value
Profit	105,0	105,3	105,1	105,3
Sales	104,8	105,0	105,7	105,7
Total Assets	106,2	103,7	103,1	106,2

The column "Best Value" provides benchmarks for company A and gives a reference in terms of comparative analysis. However, it's obvious that the results of this reference company do not follow "the rule of trends" stated above – growth rate of its total assets is higher than that of sales which, in its turn, is higher than that of profit. This situation goes against the rule and indicates that a company which is going to achieve the set indicators will show a bad financial condition. Consequently, these indicators cannot be taken as a reference, even though they are supposed to be used according to this method. This example shows once again how financial reporting interpretation may change if one takes into account interconnectivity of the trends.

Third, the results could be rather contradictory. For example, comparative analysis shows the following results (Table 4).

Table 4. The Results of Comparative Analysis for Company A

Indicator	Company A	Absolute Standard	Industry Average	Competitor
Net Profit Margin	10%	-	9%	9,5%
Debt to Equity	60%	50%	70%	55%
Asset Turnover	2	-	3	3
Current Ratio	2,05	2,00	2,20	2,50

As it can be seen, the results accomplished by Company A are difficult to interpret. They may meet the absolute standards and at the same time be worse than those of the competitors or the industry average (the case of Current ratio in the table). Otherwise, they are better than those of the

competitor, but should be improved according to the absolute standards and the industry average.

As well, there is another point: some indicators meet the requirements, and others do not. Therefore, several questions might arise.

What is the final assessment of a company's performance (taking into account the set of indicators)?

Good? Bad? Average? Mediocre?

Could this assessment be measured quantitatively?

Applying more indicators brings up even more questions, as it usually does in real life.

Consequently, comparative analysis cannot answer many questions, which puts a limit to its application as a method of financial reporting assessment and a decision supporting tool.

4. Financial ratios analysis. It represents a relative magnitude of selected financial indicators. There are a lot and can be combined in groups to interpret different spheres of a company's activity, e.g. liquidity, solvency, profitability and return. Given the fact that the main criterion of this method is the trends of different indicators over time, their growth or decline, this analysis has the same disadvantages as horizontal analysis. As an example, here are the ratios calculated for company A (Table 5).

Table 5. Financial Ratios of Company A

Ratio	Period			Real Dynamics	Recommended Dynamics	Match
	T-2	T-1	T			
Current Ratio	2,088	2,360	2,071	Differently directed	Increase	**No**
Quick Ratio	0,717	0,630	0,938	Differently directed	Increase	**No**
Collection Period	33,616	31,575	27,202	Decrease	Decrease	Yes
Sales to Total Assets	1,510	1,609	1,693	Increase	Increase	Yes
Net Profit Margin	0,042	0,054	0,056	Increase	Increase	Yes
ROA	0,087	0,063	0,050	Decrease	Increase	**No**
EPS to Market Price	0,175	0,181	0,222	Increase	Increase	Yes
Dividend Yield	0,061	0,071	0,081	Increase	Increase	Yes

Without going deeply into details, one could notice that financial ratios dynamics can be rather unclear. The ratios with the dynamics that do not match the recommended ones are highlighted in the last column, which still brings up the following questions.

How does one give the final evaluation of a company's performance if some indicators meet the requirements and others do not?

Are the conclusions going to change taking into account interconnectivity of the trends (Tables 1, 2)?

5. Integrated financial analysis. It includes different methods to effectuate consolidated assessment of a company's performance. Why is it so important that the results of a company's activity could be evaluated by a single indicator? For the following reasons.

- Complex evaluation unites the results of different activities.
- It might be regarded as a specific indicator for a company's management quality, resuming efficiency of the actions.
- It allows comparison of companies operating in different industries, the ones of different size and business structures, with the possibility of ranking them in order to evaluate the level of competitiveness and investment attractiveness.
- It provides simple interpretation of a company's performance even in cases where some indicators meet the preset criteria and others do not.
- It detects the trends in a company's development as a complex system.

As mentioned before, there are various methods of integrated assessment modeling. Without going into details it is necessary to add that many of them have the same disadvantages as the methods shown above. The most significant one is that they similarly ignore interconnectivity of the trends.

Having studied the main methods of financial analysis, one can define the characteristics which should be attributed to an analytical tool that could generate explicit and qualitative information:

- To take into account interconnectivity of the trends
- Apply integrated assessment
- Use either common standards or reference values
- Detect imperfections
- Provide recommendations

In our opinion, the tool which fully meets the set requirements is based on modeling the reference trends. It is also known as Method of dynamic standard (Syroezhin, 1980). For instance, as proved by Tonkikh, A. (Tonkikh, 2005), the main condition of a company's success in financial activity is not a simple meeting the required recommendations in terms of increase or decrease of particular indicators. The most important is to follow particular dynamic co-subordination of integrated indicators, set by a rule shown in Picture 1. In this graph, each arrow direction relates to a non-equality sign that links values of indicators growth rates (in some literature – indices). So, a → b means that Growth Rate a > Growth Rate b, and vice versa, c ← d means that Growth rate c < Growth rate d. Growth rate is a value of an indicator in the current period over its value in previous period.

Picture 1. Graph of Reference Trends of a Company.
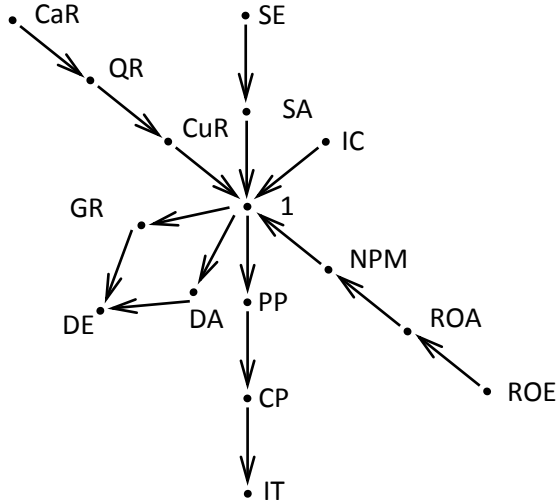
The abbreviations and the formulas are represented in Table 6.

Table 6. Table of Standard Ratios

Ratio	Abbreviation	Formula	Recommended Dynamics
Liquidity			
Current Ratio	CuR	Current Assets/Current Liabilities	Increase
Quick Ratio	QR	(Current Assets – Inventory)/Current Liabilities	Increase
Cash Ratio	CaR	(Cash + Short-term Securities)/Current Liabilities	Increase
Inventory Turnover	IT	(Inventory/Costs of Sales)*360	Decrease
Collection Period	CP	(Receivables/Annual sales)*360	Decrease
Payable Period	PP	(Payables/Costs of Sales)*360	Decrease
Sales to Total Assets	SA	Annual Sales/Total Assets	Increase
Sales to Equity	SE	Annual Sales/Equity	Increase
Solvency			
Gearing Ratio	GR	Long-term Debt/Equity	Decrease
Debt to Equity	DE	Total Liabilities/Equity	Decrease
Debt to Total Assets	DA	Total Liabilities/Total assets	Decrease
Interest Coverage	IC	EBITDA/Interest	Increase
Profitability & Return			
Net Profit Margin	NPM	(Net Profit/Annual Sales)*100%	Increase
Return on Assets	ROA	(Earnings available for common stockholders/Assets)*100%	Increase
Return on Equity	ROE	(Earnings available for common stockholders/Equity)*100%	Increase

This graph indicates the recommended relations between the trends that should define a successful business. That is why we call this tool a

reference one. If a company does not measure up to the reference tool, it reveals inefficiencies in its performance. The fewer requirements the company meets, the more inefficient it is. The set of indicators and their characteristics may vary according to the specific needs of a company. The main requirement for these indicators is to be able to describe its core activities, to be informative and easily interpreted. They should be put in order and be dynamically subordinated relatively one to another.

So the first requirement for an analytical tool is met – it takes into account the *interconnectivity of the trends*.

The final integrated assessment of a company's financial activity is calculated according to the criterion of match-mismatch with reference trends. It is evident that real dynamics are not always likely to match with the reference one. That is why it is necessary to evaluate the standard distance between real growth rates (indices) ordering matrix and a reference one (explained in details by Tonkikh, 2005). The accuracy of calculations can be provided by a special software program on the Internet site "New Technologies of Financial Analysis and Corporate Governance."

Here is an example of an almost perfect company, where the trends of particular indicators meet the set requirements (Table 7).

**Table 7.** Comparison of a Company's Real Growth Rates with Standard Ones

Ratio	Abbreviation	Real Rates	Standard Rates
Liquidity			
Current Ratio	CuR	1,451	>1
Quick Ratio	QR	1,127	>1
Cash Ratio	CaR	1,085	>1
Inventory Turnover	IT	0,997	<1
Collection Period	CP	0,985	<1
Payable Period	PP	0,555	<1
Sales to Total Assets	SA	1,927	>1
Sales to Equity	SE	1,551	>1
Solvency			
Gearing Ratio	GR	0,166	<1
Debt to Equity	DE	0,768	<1
Debt to Total Assets	DA	0,725	<1
Interest Coverage	IC	1,138	>1
Profitability & Return			
Net Profit Margin	NPM	1,194	>1
Return on Assets	ROA	1,065	>1
Return on Equity	ROE	1,043	>1

As one can see, the real growth rates meet all the standard requirements. Where an increase is required, a company's indicator increases

and when it should be a decrease, a company's indicator decreases. Based on these criteria, one might say that a company's financial activity is perfect. Is this judgment going to change after the integrated indicator calculation? Let us check if the results meet the requirements set by reference trends. In this case the degree of matching is 85%. It is relatively close to a perfect result; however, there is room for improvement (because the degree of matching is less than 100%). But it is necessary to remember that this case is rare and normally the indicators very seldom increase or decrease in the required direction. If even only one of indicators did not correspond with the standard dynamics, the integrated indicator would be much worse. In this case, two other requirements of analytical tools are met – *integrated assessment is used* and *common standards or reference values are applied*. It allowed us to significantly categorize the information retrieved from financial statements.

The method of reference trends can be used as well to determine inefficiencies of a company's financial activity. It is done by comparing a growth rates ranking in real and in reference order. Obviously, the real rank is different from a reference one, the more problematic the indicator is (a more detailed analysis of the detection of inefficiencies is provided by Tonkikh, 2005, 2007). For a more accurate visual interpretation of inefficiencies a reference graph can be drawn, where the indicators are put in descending order according to level of real ranks deviation from reference ones (Picture 2).
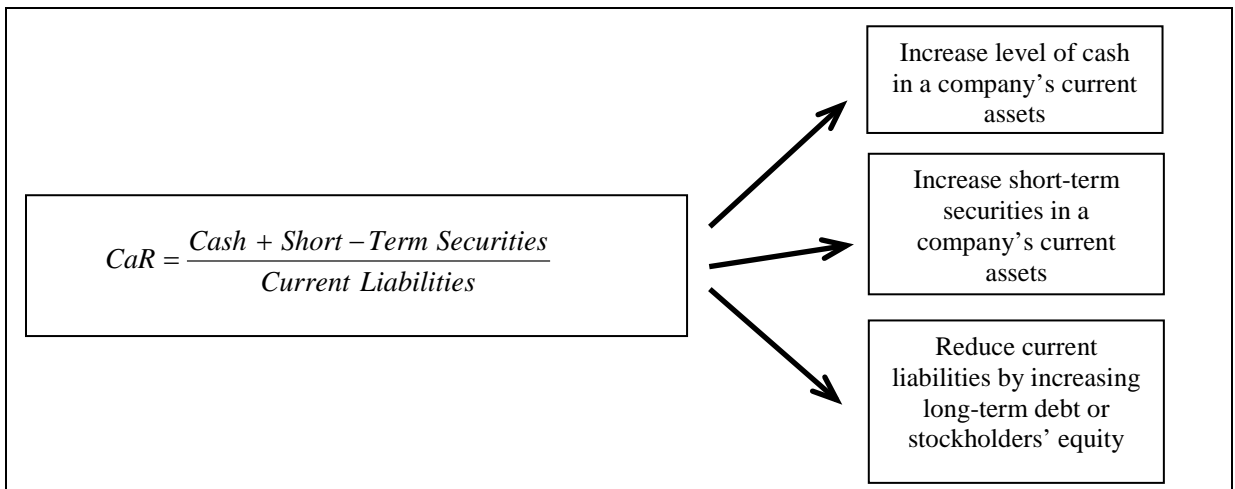
Picture 2. Reference Graph for Eliminating of Inefficiencies in a Company's Financial Activity
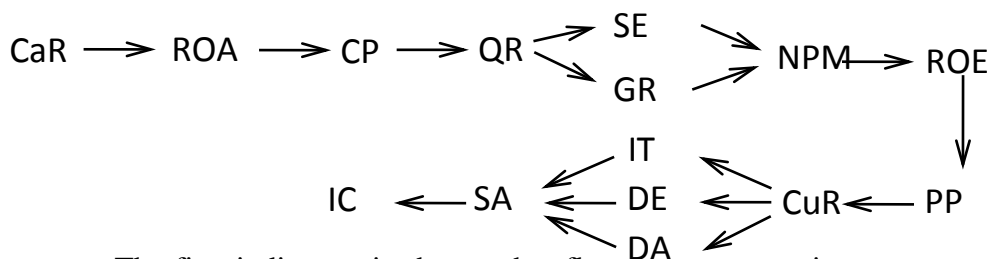
The first indicators in the graph reflect those aspects in a company's performance on which a greater emphasis should be put. Their ranks have the most significant deviation from the reference ones. So, it is essential to pay more attention to these indicators. Through the graph the indicators appear less problematic and they do not require any drastic measures in terms of the activity that they represent. Therefore this analytical tool gives the opportunity *to detect inefficiencies in a company's financial activity*. More importantly, this assessment is simple, standardized and based on objective calculations rather than subjective judgment.

Depending on the level of deviation of real indicators from reference ones, the direction for necessary actions is set, which means that measures can be taken in order to increase or decrease the "weakest" indicators. For each indicator there are specific measures to undertake. Let's take a simple example of Cash Ratio (CaR). It is equal to the sum of the most liquid assets (cash and short-term securities) over current assets. Thus, this indicator may be improved either by increasing cash and short-term securities or decreasing current liabilities (Picture 3).

Picture 3. Ways to improve Cash Ratio.

$$CaR = \frac{Cash + Short-Term\ Securities}{Current\ Liabilities}$$

Increase level of cash in a company's current assets

Increase short-term securities in a company's current assets

Reduce current liabilities by increasing long-term debt or stockholders' equity

Here is a way to design measures in order to eliminate inefficiencies of a company's performance, based on our methodology.

Conclusion:

Thus, we suggest an analytical tool for financial statements analysis, based on reference trends modeling. It allows one to standardize the information about a company's performance and, therefore, to increase the efficiency of decision-making. Moreover, the sequence of the actions is suggested by a method other than by a manager's intuition. It reduces the influence of the human factor in decision-making.

References:
Syroezhin, I. 1980. Optimization of efficiency and quality measurement system. Economy. Moscow.
Tonkikh, A.S. 2005. Financial aspects of corporate resources management. Economics Institute of UrB, Russian Academy of Sciences. Ekaterinburg-Izhevsk.

Tonkih, A.S., and S.A. Tonkih. 2007. Coordination of interests in Russian corporations. Economics Institute of UrB, Russian Academy of Sciences. Ekaterinburg-Izhevsk.

Web site «New technologies of financial analysis and corporate governance». http://www.freean.ru/