Planning and Analysis of the Company's Financial Performances by Using a Software Simulation

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ABSTRACT
Information Technology includes a wide range of software solution that helps managers in decision making processes in order to increase the company's business performance. Using software solution in financial analysis is a valuable tool for managers in the financial decision making process. The objective of the study was accomplished by developing Software that easily determines the financial performances of the company through integration of the analysis of financial indicators and DuPont profitability analysis model. Through this software, managers will be able to calculate the current financial state and visually analyze how their actions will affect the financial performance of the company. This will enable them to identify the best ways to improve the financial performance of the company. The software can perform a financial analysis and give a clear, useful overview of the current business performance and can also help in planning the growth of the company. The Software can also be implemented in educational purposes for students and managers in the field of financial management.

KEYWORDS: *Interactive software, financial analysis, financial ratios, DuPont analysis, financial reports.*

JEL CLASSIFICATION: *G32; C63*

1. INTRODUCTION

Tough competition in globalized economy requires that the contemporary manager applies more innovative ways to accomplishing competitive advantage in the market. In this framework is the creating of the long term financial policy that requires huge amount of valuable information and assumptions about the current and future financial statement of the company. Financial analysis and financial data processing create the basis for making financial decisions by the financial managers in order to improve the financial performances of the company. Financial analysis includes using different financial reports the purpose of which is providing financial information about assets, liabilities, capital, loss/profit and movement of the cash flow of the company.

Most commonly used tools and actions in analyzing financial reports are the following ones (Slibar, 2010):

- Following the changes of the operation of the company by comparing financial reports in more accounting periods;

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- Following the changes of the financial performances by calculating certain financial indicators and their comparison with the indicators/ratio of the company in the previous years, with the average in the field, as well as with the average of the competitors;
- Analysis of the threshold of the profitability, prediction of the cash flow, analysis of the gross margins etc.

There is usually a lot of information that need processing and analyzing, and sometimes it is hard for managers to perceive it. The figures in the financial reports cannot, on their own, be a basis for making qualified evaluations about the current financial condition and success of the company. Therefore, it is necessary to calculate the financial indicators which will evaluate the financial condition of the company. Financial indicators analysis is most often used and it can give a good overview about the financial condition of the company (Vukoja, n.d.).

Besides certain financial indicators, managers often use the DuPont method which incorporates a group of financial indicators: profitability, efficiency of assets and debt use. The DuPont method is mainly used for analytical requirements and planning but also for managing and development of the companies. This method unites the information from the balance sheet and income statement so that the manager gets data about the profitability of the assets (ROA) and the equity (ROE) of the company (Sesar, Buntak & Borlinic, 2015).

The focus of this study is to update and at the same time to remove the identified weaknesses from our previously offered software solution for computer simulation and visualization of the financial reports (Panovska, Boshkoska & Prisaganec, 2010). After this software has been used by some managers in Macedonian companies, we identified these weaknesses:

- The software does not offer comparison of the financial indicators with an average value in the suitable business fields of the companies;
- The old version is not easy to use due to the classic option menu with more windows;
- The software does not offer a possibility for visual presentation of the data before and after the simulation and mutual comparison at the same time.

The purpose of this paper is to develop a software for a complete overview of the financial situation of the firms in order to obtain a clearer picture of the financial performance of the company. The Software will calculate the following financial ratios: profitability, liquidity, activity and coverage ratio. The Software will also include a calculation, visual presentation and simulation of the DuPont analysis.

The research methodology consisted of theoretical analysis of various research papers that were dealing with the issue of financial analysis and financial performances. The computer software is used for calculation of the current financial performance of the company as well as computer simulation method for predicting how management decisions will affect the financial performance of the company.

The paper will contribute to the theory and practice of financial analysis and decision making process. According to our knowledge, there is no similar software developed by authors that can be used for analyzing and simulation of the financial performances of Macedonian companies. The advantage of this software is that it allows not only calculating of the financial indicators but also comparison of the average value in the business field. Furthermore, the calculations and simulation will be visually presented.

In the first part of the paper we present the literature review which refers to: understanding of the financial ratios, as well as, understanding the essence of DuPont analysis and its usefulness for managers. The second part of the paper analyzes the research designs and methodology applied. The explanation of the developed software, its visual presentation and its usefulness are presented in the third part of the paper. And the last part offers conclusion and recommendations for future studies.

2. LITERATURE REVIEW

Financial analysis is an important tool that managers use when making business decisions. The financial analysis is a way of selection, evaluation and interpretation of financial data. Managers can acquire financial data from different sources, but the main source is the financial reports of the company. (Drake & Fabozzi, 2012). The financial analysis is often equated to the analysis of the financial indicators which represent a relation between two values represented in a mathematical formula (Knezevic, Stanisic & Mizdrakovic, 2013). Liesz and Maranville (2008) in their study point out that for over 40 years financial analysts, researchers and managers have used the financial indicators to determine the advantages and disadvantages of the company. Financial ratios could be used in managerial analysis, in credit analysis and by investors in any investment analysis (Almansour, 2015). There are many ratios that can be used by the financial analysts, but they all measure the ability of the company to meet its short-term liabilities, how the company is doing in using its assets, generating profits from each dollar of sales, the extent to which the company is financed by borrowing, turning over inventory, etc. (Auerbach, 2000).

Peterson – Drake and Fabozzi use the term "performances" for the accomplished financial results of the companies which in a narrower sense refer to profitability as the most representative indicator expressed by the investment return (ROI). This indicator refers to the return of the total assets and the return rate of the capital of the comapny. The authors Doupnik and Perere explain the financial performances from an accounting point of view where they emphasize the profit which represents all the business functions starting from the sales function via production and supply expenses to the financial function (income and expenses). In the wider sense of the word, financial performances should be based on information contained in financial reports. In that context, many authors for evaluating financial performances, besides profitability, point out the meaning of the following financial indicators: liquidity, solvency and activity. But, whether the financial performances are considered in the narrower or wider sense, it can be concluded that their evaluation is based on the information acquired from the financial reports (Cited by Bogicevic & Stojanovic, 2014).

Using the financial indicators we can make two different but equally important comparisons: internal and external. When the analysis makes comparison of the current indicators with those in the past, and the expected ones in the future, for the same company, it is an internal comparison. With this, it can be determined whether, in the examined period, there has been improvement or worsening of the financial condition of the company. With the external comparison there is a comparison between the indicators of the company with the indexes of similar companies or with the industrial average, in a certain period of time. This analysis shows whether there is a remarkable difference of the values of the financial indicators with 'benchmarks' in the business filed of the company (Horne & Wachowicz, 2005). Boeninger (2011) in his article, highlighted several resources that can be used to find industry and financial ratios of the company. Among them are the following ones: Mergent Online,

Factiva, S&P Net Advantage, OneSource, Yahoo Industry Center, Research Insight, Bizminer etc.
Financial planning is an important function for the financial managers which results in a series of planned financial reports. Based on the financial reports, the profit and conditions for borrowing can be predicted. Furthermore, it helps when comparing current financial performances with the planned ones to enable necessary adjustments.

Financial analysts and planners have developed numerous models which can determine how well a company works. Namely, in order to make effective financial decision and create long term financial policy, managers need a method which connects: the profitability of the company, efficiency of assets and debt use. Of the many models for analyzing the financial condition of the company, the DuPont analysis is the simplest for managers to use (Brigham, Daves 2014). This analysis can be used as a compass which can help the managers to identify weak and strong sides of the financial reports (Sheela & Karthikeyan, 2012). The DuPont analysis is often used by top financial managers for grading the financial condition of the company in the previous period, when making business decisions for the future, but also in the control process (Ruzicic, 2015). With the help of the DuPont model we can estimate the financial work of the companies using data from the balance sheet and income statement. This estimation enables the managers to identify the strategies that can improve the future work of the companies **(**Roucan - Kane et al., 2013).

In the process of financial analysis the usefulness is greater for the managers if they can make comparison not only with the past period or with the competition but also to make computer simulation of the planned financial decisions they want to implement in the future business processes.

3. RESEARCH METHODOLOGY

Computer simulation is among the most widely used engineering and scientific methods (Schruben, 2008). With the help of financial data simulation, managers can see how their decisions reflect the financial performances of the company. The results from the computer simulation can play a significant role in the analysis process, making decisions and planning strategies which would generally improve the work of the company. It would be especially useful if the manager can simultaneously compare the received simulation results with the starting financial condition of the company or the middle value in the business field, as well as planned financial performances for the future.

Interactive software for financial planning enables the managers to test their assumptions that are the basis for the plans, and also to research different possible decision scenarios. In that context, computer simulation can function as planning financial scenario in some companies. Scenario planning is one of many tools managers can use in the process of financial planning. Scenario planning does not mean precise prediction of the future, but understanding how certain decisions can reflect the work of the company. Milisavjlevic and Todorovic (1994) defined scenario as “a hypothetical sequence of events designed to focus attention on the reasons of the decision – making process” The scenario applies to the software which shows correlation regarding different activities and their effects. With the computer scenario it is possible to combine the interaction of many factors on the financial situation of the company, in the future. Thus, managers receive information about financial benefits and risks. (Boshkoska, Prisaganec & Panovska, 2013).

The research attempts to answer the following question: Would the developed software for financial calculation and simulation help managers to analyze the effects from their decision on financial performance of the company?

As we said before, our software, besides calculating the basic financial indicators, enables calculation of the DuPont coefficient. DuPont analysis shows the relation between: profitability, operational efficiency and financial leverage. In the calculation, we use the DuPont analysis where there is a decomposition of ROE in three parts:

$$\text{ROE} = \text{Profit margin} * \text{Total Asset Turnover} * \text{Financial leverage}^{\text{i}} \quad (1)$$

ROE is an indicator for the return of the shareholder's equity and is a measure for the total performances of the company. ROE measures the efficiency with which a company allocates and manages its resources (Brigham & Houston, 2003).
Since these three indicators are calculated in separate formulas, ROE can be calculated in the following way:

$$\text{ROE} = \frac{\text{Net Profit}}{\text{Sales}} * \frac{\text{Sales}}{\text{Total Assets}} * \frac{\text{Total Assets}}{\text{Total Equity}} \quad (2)$$

ROE can be graphically presented in the following way:

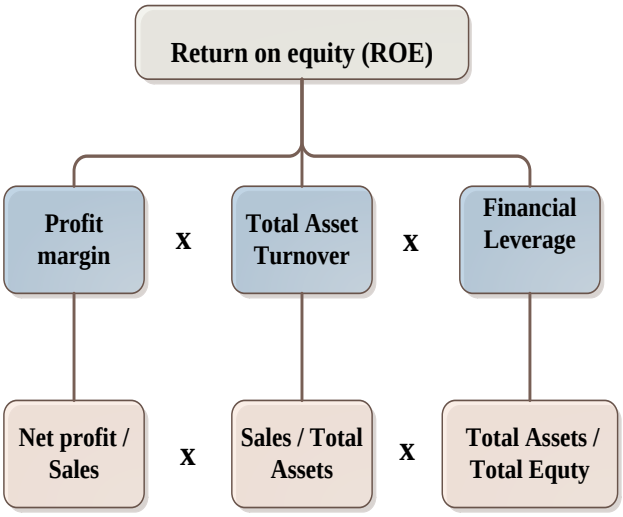

Figure 1. DuPont System
Source: Authors

As Thorpt (2012) emphasizes managers would like to see the company to increase its ROE by increasing its profit margin or its asset turnover.

Later on, we display the interface of the software and the way of using it and we also explain the usefulness of the software to the financial and top management in the process of financial planning and decision making.

4. AN OVERVIEW OF THE DEVELOPED SOFTWARE

One of the most important activities for managers is decision making where they always have more alternatives. The difficulty in decision making is to decide and choose the best alternative. Having suitable information is the basis for making appropriate decisions connected to the work of the companies. As we have previously mentioned, when the financial performances of the company are in question, the main source of information mostly used by managers are the financial reports. However, in order for the managers to choose the best alternative, current information is not enough. They need to see how their decisions will affect future financial performances of the company. Managers usually do this by intuition which can negatively affect the activities of the company. To avoid making unsuitable decisions, it is necessary for the managers to use appropriate tools which will help them to find the real alternative. For this purpose, managers use financial indicators which show, with numbers, the financial condition of the company. By using financial reports, managers can calculate the current financial indicators but it is more useful if they know how their decisions will affect the financial behavior of the company in the future. This is possible only if they use models which will help to simulate the existing alternatives where, with the analysis of the simulated results, they would be able to make a decision which is reliable up to a certain degree.

Computer technology provides opportunities to obtain and process financial analysis data and it can help managers in decision-making related to the financial performance of the companies. Today, with the opportunities and development provided by information technology, tools can be designed to enable the manager simulate alternative decisions, conduct analysis and visual comparison of simulation results and make the right decision.
In this research we offer a software solution for analyzing and simulation of the financial performances of the company. In the latest and improved version the DuPont model is used as a basic indicator for calculating the financial performances of the company. Besides the DuPont model, other financial indicators are represented which can help the manager in the process of decision making.

While making the software, most attention was paid to its interface which provides and easier application of the software. The application has only one window which contains all the necessary financial information (Figure 2). The interface lacks the drop-down menu and the classic windows interface is avoided so that the manager can pay attention to the financial information and results.

As entry information, the application uses standard financial reports of the company: a balance sheet and an income statement. In the upper part of the window, there is information from the balance sheet. On the pink background, the assets of the company are presented, and on the light blue one we see the liabilities of the balance sheet. In the upper right part, on a green background, there are the data from the income statement.

The access to each item of the financial report is enabled by two buttons, one marked with a left arrow and the other one with a right arrow. This marking enables data simulation. If you click the left arrow, the value decreases by 5%, and if you press the right arrow, it goes up by 5%. The manager can mostly use these buttons if he wants to simulate planned financial performances of the company. The application also enables to enter the value of the respectable financial data in the appropriate fields for balance sheet and income statement.

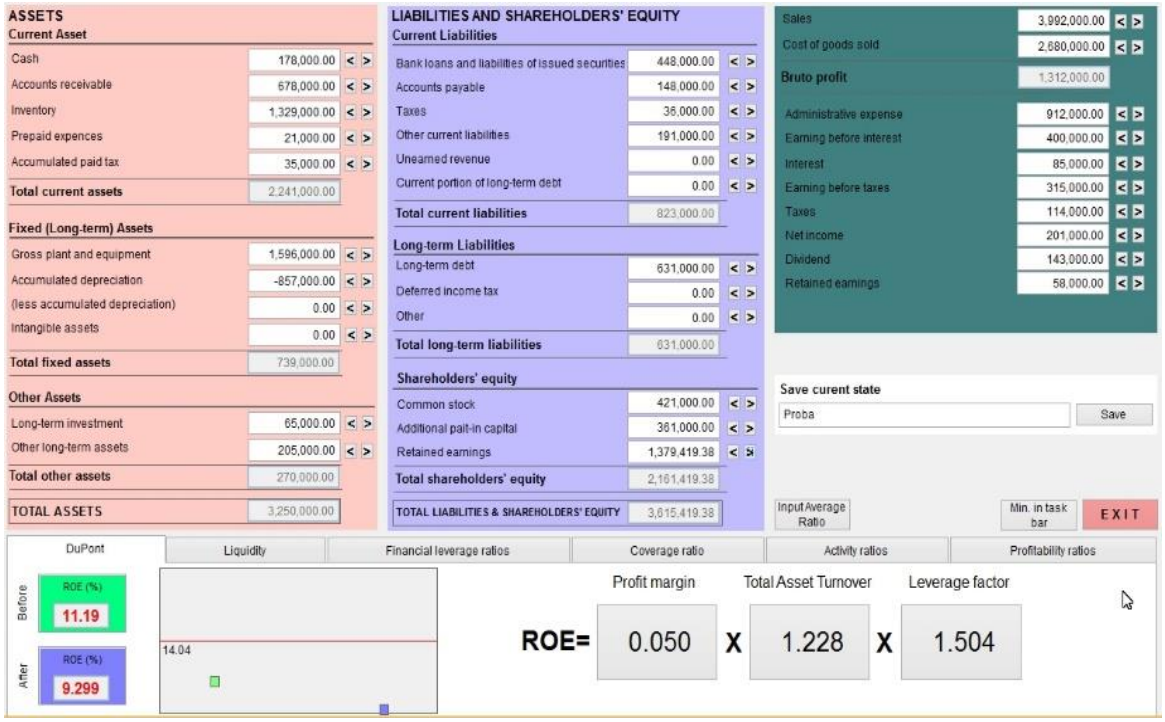

Figure 2. Software interface
Source: Authors

In the lower part of the window, there are six tabs, as shown in Figure 3.

Figure 3. Visual overview of the financial indicators
Source: Authors

In each of the tabs there are financial indicators of a certain financial group. ROE is presented in the first tab – the financial indicator for the calculation of which the DuPont model has been used. Then, the second tab – liquidity follows which has two financial indicators: Current and Quick Ratio, or Acid test ratio. The third tab - Financial leverage ratios, displays the Debt to-equity ratio and Total debt to asset ratio. The Coverage ratio tab shows the Interest coverage ratio. In the Activity ratios tab five financial indicators are displayed: Accounts receivable turnover, Receivable turnover in days, Inventory turnover ratio, Inventory turnover ratio in days, Total assets turnover. The last tab displays the Profitability ratios and it contains the following financial indicators: Gross profit margin, Return on total assets and Return on common equity.

Figure 4 shows the layout of the visual presentation of the current, simulated and average value of the DuPont ratio.

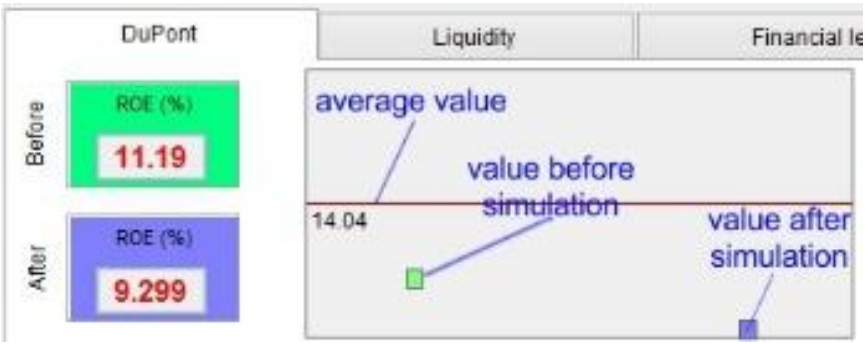

Figure 4. Overview of the DuPont indicator
Source: Authors

The picture shows two values of ROE, 11.19% - on the green background and 9.299 - on the blue one. At the beginning, when the application is started, these two values are equal. The value on the green background is received by using the data from the financial reports whereas the value on the blue background is received by calculating after simulating the new financial performances of the company. To the right of the values, as you can see from picture 4, there is a visual of the DuPont indicator. The red line in the middle represents the average value of the DuPont indicator for the appropriate field of the company. This value is shown in the left part, below the red line.

In the visual presentation there are two little squares, of which is one green and the other one is blue. These squares show the values of the DuPont indicator. At the beginning these squares are at the same distance from the red line and they show whether, according to the existing financial reports, the company has a bigger or a smaller value on the DuPont indicator than the average value in the business field. When the manager starts simulating a new financial condition, the two squares change their position. The manager visually follows whether, with the simulation, the DuPont indicator grows or falls according to the starting value.

In the same manner, the rest of the financial indicators are presented. When simulating, the manager can observe the real value of the indicator, the simulated value and the average value of the indicator in the business field.

The software designed in this way, has the following advantages:

- It is easy to use;
- It allows visual comparison of the simulated results with the starting values;
- Comparison of the starting and simulated value with the average value of the business field of the company.

The interface of the software solution is easy to be used because it consists of only one window. It contains an income statement, a balance sheet and financial indicators. In the software solution, the manager can simultaneously observe both the starting and the simulated value of the financial indicators, with figures and visually. In the software application, the manager can update the average values of the financial indicators for the business field that the company belongs to. This enables the manager to get visual idea of the starting and simulated value compared to the average value of the business field.

5. CONCLUSION

Financial statement analysis is an integral part of the management process for any organization. (Isberg, 1998). The management needs to know how to use the information from the financial analysis in order to accomplish the goals of the company (Slibar, 2010). Excellent tools for this purpose are the analysis of financial indicators and the DuPont analysis. The advantage of DuPont analysis for managers is that it takes into account the major financial ratios – efficiency, asset use, and debt leverage. (Bernhardt, n.d.).

The advantage of information technology is that it can provide more efficient and better understanding of the financial decisions making by the financial managers. An appropriate financial software solution can help financial managers to make decisions which will balance the risk and profitability.

The contribution of our research is that enables managers a software for calculating, simulating of the financial indicators, as well of the DuPont indicator. The graphical presentation allows identifying potential financial problems and taking effective measures to avoid them. The software is a useful tool from which business owners, managers, and analysts can benefit in evaluating the firm and making recommendations for its improvement.
In our future research we intend to focus on implementation of the developed software in all sized company in order to test it and to detect the pros and cons of the software. Also we planned to conduct a comparative analysis of financial indicators of selected Macedonian companies in order to identify their strengths and weaknesses. Such a comparative analysis can be helpful for managers and owners in the decision making process towards improvement of the business performance of the company and its competitive positions.

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[i] Financial leverage reflects the amount of debt used in the capital structure of the firm (Block, Hirt and Danielsen, (2014, p.133)