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COMPUTER SIMULATION AND PLANNING OF THE COMPANY PROFITABILITY

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ABSTRACT

To achieve high job performance, the managers need to have information about the key activities of all sectors. If the flow of information is greater, the greater will be the knowledge and expertise in the company that are a source of competitive advantage and profitability. Using technology for creation of software packages allow sectors managers to monitor and plan all activities and operations associated with production, sales and financing. Today, choosing and designing a software package for planning the profitability is a major challenge for managers in companies. The aim of this paper is to show how managers can make efficient planning of the company profitability with computer simulation technique.

Keywords: Financial reports, visualization, financial ratios, profitability, break – even point, software, financial planning

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INTRODUCTION

In accordance with the legal regulations, the enterprise writes financial reports at the end of each year. The preparation of financial reports derives from the need for gaining insights into the financial situation not only once a year, but continuously in the course of the year. The value of the financial reports on its own cannot serve as a basis for reaching qualified evaluation of the current status and success of the company. That is why it is necessary to calculate the financial ratios, through which the financial situation of a company will be evaluated.

One of the major problems faced by managers refers to the quality of the planning and control of the behavior of profits in different situations. In solving this problem can help computer simulation, or software that will allow analysis of alternative profitable situations. Therefore, the main objective of the paper is improvement variant financial planning using IT support in making financial decisions. The software, developed for the purposes of this paper, by using the information from the financial statements, presents financial indicators and the level of the company's profitability in a variety of situations. This software allows users to obtain a realistic idea of how through a change in the financial statements can change the profitability and financial indicators.

The research is based on the hypothesis that if managers analyze the relationship between total costs and profits by using application software, then there will be a positive impact on managerial planning and controlling of the company profitability. In the first part of this paper will be analyzing the significance of the understanding the contest and the meaning of the financial reports and the financial ratios. Their right interpretation is important for the managers for successful managing of the company. The explanation of the software is in the focus of the research in the second part of the paper where we explained its usefulness as well as the software interface. The scope of the research in the paper will cover the explanation of the mentioned objective and will depend on the knowledge and information that exists in the literature that examines the managerial practice, knowledge and skills.The paper will contribute to the theory and practice of financial planning. Also, the benefits of this software will have managers who will be able to use it for more efficient planning of the company's profitability. Software can be implemented in the educational purposes for students and managers in the field of financial management.

Financial Reports and Financial Ratios as a Basis for Computer Simulations

The key to each business success can be found in the answer to the question: "How to handle finances?" Inappropriate managing of the financial flows of a firm can ruin a successful business. In order to avoid that, managers should continuously have at their disposal information on the financial operations which refer to the following indicators: the amount of profit, the extent of work expansion to keep up the growth, consequences of the credit policy, the amount of the expenditures etc. For that purpose, it is essential to provide mechanisms for monitoring and planning the development of a business. In order for the business to avoid facing a financial crisis, good financial procedures should be set which will be applied to the demand' payment, to the credit policy, the financial flow etc. The efficient financial management is based on well structured financial reports which are comprehensible for the managers. Managers can take better decisions much more easily if the finances are well controlled and understood. In fact, adequately structured and presented financial reports with the interface of the information technology are quite helpful in discovering concessions to the plan or other indications of upcoming problems in the financial

flow. Financial reports present overviews of the operative, financial and investment activities of a business and they provide information which will be beneficial to managers, investors and creditors in approving of credit loans, in the course of investing as well as in the course of taking other business decisions.

For a successful functioning of a business, it is essential that accountants prepare adequate financial report in order to help those who are in charge and manage the company to understand and interpret them. If the reports do not correspond with the need of the financial managers, problems in relation with the reality of the company's sales and benefit analysis will arise. In addition, we will provide some insights into the basic features of the balance sheet and the income statement which will be a basis of the software and computer simulation.

The Balance Sheet

Balance sheet depicts the assets, the obligations and the shareholders' capital, in a precisely determined moment of time, most frequently at the end of the fiscal year of the company's operations. The first category in the balance sheet – the assets, represents the resources of the company such as buildings and equipment which are used in the production of goods or services. The total assets are being financed either through liabilities or through the owner's equity. Liabilities present the firm financially and can be of two types: short-term and long-term liabilities. (Block and Hirt, 2008).

Owner's equity represents the part of the company's value which is owned by the shareholders. More precisely, the owner's equity can be calculated as the difference between the total assets and the total liabilities of the company. Managers are looking for ways of financing the assets which are engaged in the business. One could seek this answer in the capital structure which comprises the total amount of debts of a company and the owners' equity. In case an increase in the business activities is being planned, managers will need to provide an additional amount of working capital and depending on the type and the size of the investments, a need for procurement of the basic assets may arise. In those cases, managers ask themselves how to finance the investment. The answer to this question depends on the type of decision the managerial staff will decide to do. In case they want to refrain from incurring new debts, they will decide for taking back a certain percentage out of the engaged assets. Another way of financing the business growth may be combined with a new indebtedness and sale of shares. This combination is a dexterous and wise decision and it is known as financial ratio under the term financial leverage. This ratio displays the limit of over- indebtedness which incurs a risk, i.e. not being able to return the debt out of the disposable cash, which could force the enterprise into a bankruptcy. The balance sheet, that displayed the basic assets and the capital structure, presents a very useful concept for financial analysis and financial planning.

The Income Statement

Another financial report is the income statement with which the benefits and the costs of the company are being monitored over a certain period of time. At the beginning of the income statement the sale's benefits are being depicted out of which various other expenditures (operating expenditures, interest expenditures and taxes) are being extracted, in order to eventually obtain the net income which is disposable to the owners of the company. In case the company has not issued priority shares, the net income is equivalent to the profit which is at the common shareholders' disposal. The managers who understand the relationships and relations in the financial reports can understand the functioning of the business more easily. At the same time, by using the requisite financial ratios, they can take good decisions in the context of the entire business. To this end, applicative software whose benefits will be depicted in the following text was created.

Financial Ratios

The basic idea about the financial operations of a company can be obtained via financial reports whose evolutionary observation present the (none) liquidity of a company. That is why the management team uses the information contained in these reports. As we have already mentioned, the managers find the traditional form of the reports, represented by numbers, difficult to understand. Namely, although the figures give answers to certain questions in relation to the company's operations, yet more often than not, the managers are not in a position to use them purposefully.

Financial ratios are used for evaluation of the financial reports and also for measuring the financial performances. These ratios present the relationship between two financial balances or financial calculations. The ratios have been grouped in six groups in this application: Liquidity ratios, Debt ratios, Coverage ratios, Activity ratios and Profitability ratios.

- *Liquidity ratios* are used to determine whether the firm can pay off its short-term liabilities (Ross, 2008). Within the frameworks of the liquidity ratios there is an elaboration on: current ratio and quick, or acid test, ratio. Current ratio is being calculated as a relation between the current assets and current liabilities. Current assets include marketable securities, cash, accounts receivable, inventories and prepaid items. Current liabilities include: short-term notes payable, accounts payable, salaries payable, taxes payable, current maturities of long-term debt and other accrued expenses. Quick ratio is being calculated when the inventories are extracted from the current assets and the obtained sum is divided by the current liabilities. This ratio measures the ability of the firm to pay off the current liabilities with the most liquid assets. The quick ratio includes marketable securities, cash and accounts receivable.
- *The debt ratio* is used to estimate the firm' financial risk, namely whether the firm is capable of dealing with its debt liabilities. In this ratio group we have analyzed the following two ratios: debt to-equity ratio, total debt to-assets. Debt to-equity ratio shows how the

company finances its operation with debt relative to the book value of its shareholders' equity. Total debt to-assets ratio indicates the proportion of assets financed with debt (Fabozzi and Peterson, 2003).

- *Coverage ratios* presents how well the firm can cover or meet the interest payments associated with debt. The ratio compares the funds available to pay interest (that is, earnings before interest and taxes) with the interest expense (Fabozzi and Peterson, 2003).
- *Activity ratios* - this group of ratios measures the effectiveness of the firm in managing its assets. Ratios that analyze the different types of assets are:
- Accounts receivable turnover measures the number of times that the firm was able to convert its receivables over into cash;
- Receivables turnover in days (days in accounts receivable) – the number of days in accounts receivable is the average length of time required to collect the firm's receivables;
- Inventory turnover ratio indicates how quickly a firm has used inventory to generate the goods and services that are sold (Fabozzi and Peterson, 2003).
- Inventory turnover ratio in days – this ratio indicates the average number of days the firm kept the stock before it was sold;
- Total asset turnover measures the turnover of total assets of the firm.
- *Profitability ratios* show the combined effects of liquidity, asset management, and debt on operating results (Brigham and Houston, 2003). The ratios in this group are:
- Gross profit margin compare gross profit with sales
- Return on total assets (ROA) is a basic measure of the efficiency with which a company allocates and manages its resources (Higins, 2004).
- Return on common equity (ROE) measure the efficiency with which a company employs owner' capital results (Brigham and Houston, 2003).

This software automatically performs calculations of the previously mentioned financial ratios and together with the financial reports present them on the main screen (Picture 1). This combined way of presenting the financial reports and financial ratios provides a complete overview of the financial situation of the firm.

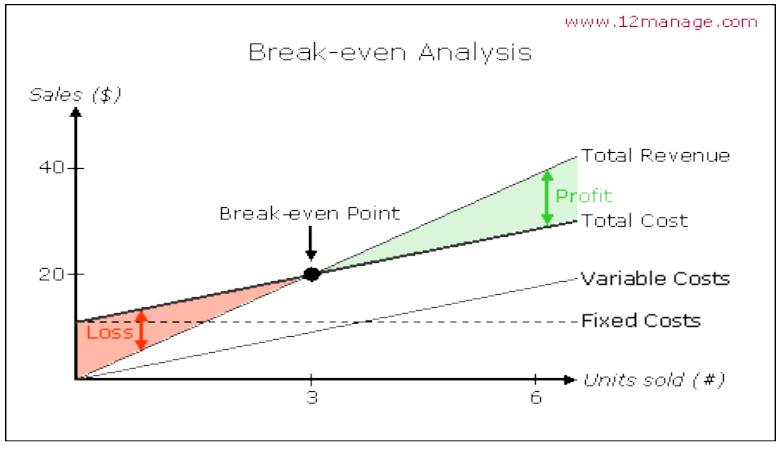
Analysis of The Break – Even Point

When the manager is planning to start a new production process or planning to make some changes in the structure of the costs of existing production, the financial indicators do not give enough information on the cost impact of change on the profitability of the company. These kind of information can be obtained from the break-even point of the enterprise whose analysis is in the text that follows.

Figure 1 represents a graphical display of relations between the total revenues and total costs for different levels of production and sales. (Van Horne and Wachowicz, 2007)

By using profitability analysis can be noticed the effects of different decisions that influence sales and costs of which depends the accomplished profit. The profitability point can be presented after determination of the variable costs, fixed costs and income. That is the activity level where the overall costs and incomes are equal. In other words, that is an output point in which the enterprise does not make any income or expenditures. .

Figure-1. Diagram of profitability[1]



$$Pr = P*Q - FC - VC \qquad (1)$$

Pr – profit

P – Price per unit

Q – Quantity of product sold

FC – fixed costs

VC – variable costs

When profit is zero, production is in its break – even point, , i.e. total income from sold products cover the full costs of operation.

When Pr = 0 then

$$P*Q = FC + VC \qquad (2)$$

The manager's ability to appropriately control the costs can be higher if previously can be assumed the influence of the profitability point. In that sense, it is necessary for the account management to permanently analyze the cost behavior and to compare it with the profitability points, in order for the managers to get useful information about the influence of the higher and smaller changes of the costs during the decision-making process. The profitability diagrams give the managers very useful information to quickly resemble the potential profits in the enterprise. The application of preliminary, non-official budget numbers as a base of the profitability diagram can create a

[1] http://www.12manage.com/methods_break-even_point.html

possibility for the managers to impose variant changes in the budget if the assuming projection does not satisfy. The relationships between costs and profit can be illustrated by using applicative software that gives valuable information about the profitability threshold. In other words, it provides information about the level of fixed and variable costs and the ratio of contribution or the meaning of the high and low-level contribution. This information can facilitate the decision-making process in the company that is of valuable importance for planning and controlling the company profitability. In that way, managers have information that helps them to predict costs and profit trends. All that will help the managers to derive decisions that are characterized with low level risk and increased security level. In the following text below, will be depicted an application software by which the manager can perform simulations of the indicators of which depends the financial stability of the enterprise.

Software for Simulation and Planning of the Company Profitability

The word “scenario” was first used by Kahnn and Wiener in the 60 years, in their book "2000". The scenario is defined as "a hypothetical sequence of events designed to focus attention on the reasons of the decision-making process (Milisavljevic and Todorovic., 1994). This scenario applies in the software method which is shown 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 for financial benefits and risks. The managers can benefit from this kind of information of which can be seen profits and risk in taking alternative actions in the future. A changing business environment in which enterprises operate in big part influences the level of efficiency of the decisions that managers are adopting in relation to planning the business profitability. It will be very useful for the managers if they possess available applicative software that will enable them to be more efficient in planning the activities connected with the financial work of the enterprise. The managers by using the application described in this paper can plan the enterprise profitability by simulating the data numbers presented in the enterprise balance of accounts and to visually control the income profit. The application presented in this paper uses the balance sheet and the income statement input parameters. This structure of financial reports comprises the basic factors which determine the success or the failure of the business. These factors are the foundations for obtaining the ratios for monitoring and evaluation of the financial success of the firm. Within the application software, these indicators are computer-calculated with an option for visualization and simulation of the needs of the business development. The application software comprises options for short-term and long-term planning of finances and financial resources, but it also comprises a visual overview of the expected business performances. Furthermore, the software also comprises simulation options of the elements contained in the financial reports. For instance, alternation in the sum of any of the points in the financial reports has direct implications on the sum of the financial

ratios and it represents them visually. Thus, the managers have a solid basis for variable decision making and choosing the best option.

The general usefulness of the software is due to the following:

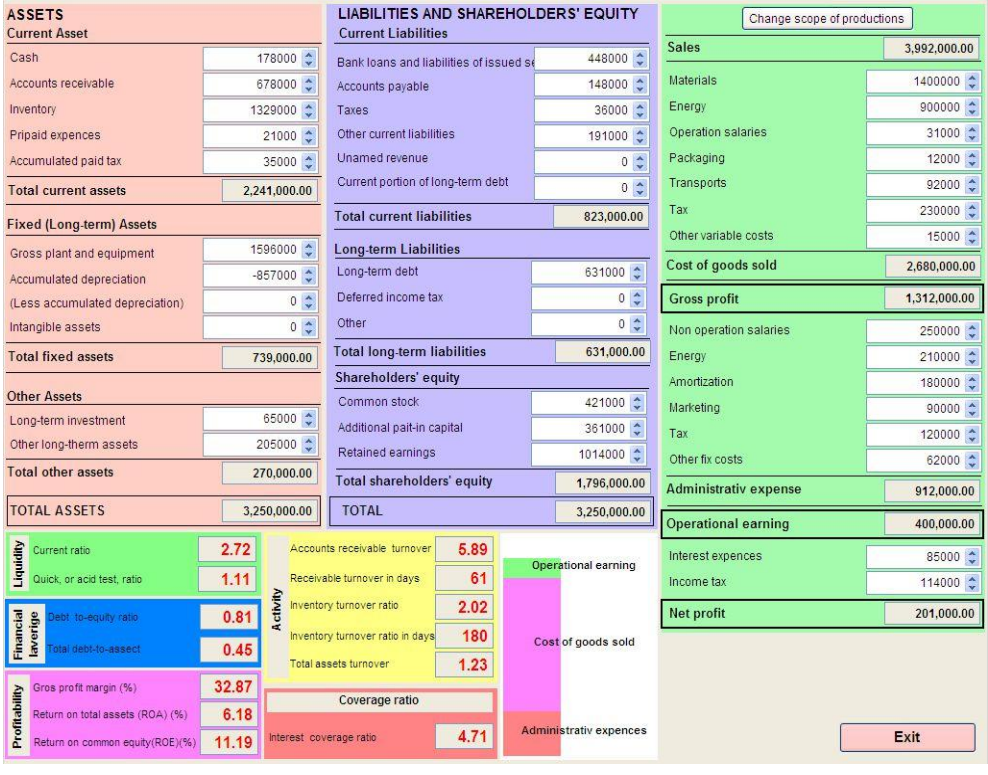
- Firstly, the accounting financial reports are directly modified and it makes them more comprehensible for the process of managerial decision making;
- Secondly, calculations and visual presentations of financial ratios, which are helpful in obtaining a clearer picture of the financial situation of the company;
- Thirdly, the application software provides options for modeling of the sustainable growth of the business.

  Finally, the software gives a visual idea how the change of the fixed and variable costs can affect the level of realizing profitability, i.e., on the realized break-even point.

Software Interface

Within this section we will explain the data displayed on the screen of the program. In the upper part of the screen are shown the balance sheet and income statement. The third column gives a detailed overview of fixed and variable costs. This kind of friendly interface will help the manager to specify the cost of production and to determine their impact on the profit and the company's liquidity.

Picture-1. Main interface



In the bottom left corner, in two columns, are shown the calculated financial indicators. The software automatically updates the indicators depending on the changed data in the financial statements. In the same section of the application the manager can virtually change the data of the financial reports and to increase or decrease them for a certain percentage and to monitor their impact on the financial ratios. Thus, the manager performs a simulation of a future financial state of the firm which is of a paramount importance in the process of reaching the optimum decision which is crucial for the future development of the firm.

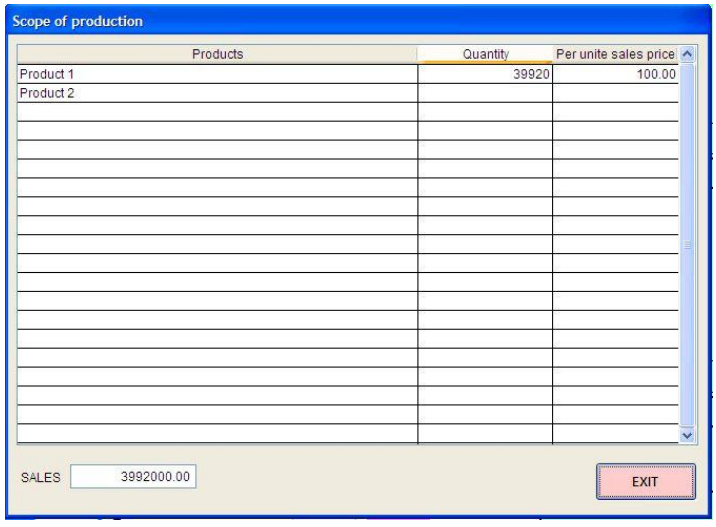
At the bottom of the screen, right of the financial indicators, graphic displays the profitability of the enterprise. This graphic used the break-even point calculated according to the formula 1. (Picture 2)

Picture-2. Profitability indicators of the company

When the amount of the fixed and variable costs are changed it comes to modification in the graphic on the company's profitability. The three different colors represented administrative expenses as a percentage: (red), cost of goods sold (pink) and operational earning (green) which provides a visual representation of the incomes for a given production.

On the interface can be seen that at the upper right corner there is a button that activates an additional window (Picture 3), i.e., a table where we can enter the sales price and the amount of production for 20 different products. This allows the manager to cover the total production process in the company. Changes in this table will directly change the value of the total income of the company that will bring a modification in the financial indicators and visual representation of the break-even point. This change manager will immediately notice at the software interface. (Picture 1). The changes in the financial indicators and the break – even point displayed the profitability of the company in simulated conditions.

Picture-3. Scope of production of the company



The application is a valuable tool that can be used by the manager in bringing his decisions for the next directions of the financial work of the enterprise. That enables the user (manager/s) to prepare and adopt many strategic alternatives for realizing a higher profit. A visual presentation of the realized or planned profit in the working process represents a very powerful base in deriving important business decisions. Besides that, the visual presentation is used as a control mechanism about the share of the costs and profits in the fixed sales price which means a great decision support during the process of modeling the planned balance of accounts.

CONCLUSIONS

The successful financial manager is one who knows how to read, understand and properly transform data from financial statements into information that can be used in the decision process. For the purpose of the computer simulation, the Balance Sheet contains information for: Total Assets, Liabilities and Shareholders' Equity and in the Income statement are presented in detail fixed and variable costs and profits. Besides the financial statements to evaluate the financial situation of the company financial manager must take into account and analyze the financial indicators (Liquidity, Debt, Coverage, Activity and Profitability ratios) that can be calculated from the financial statements. Because of their importance, the financial statements and financial indicators, along with the total cost and the break-even point are visually represented in the this software. The applicative software presented in this paper enables managers to obtain a visual overview of the financial operations of the company, as well as, to simulate the company profitability. Through the analyze of different scenarios this kind of software is a powerful tool for efficient decisions making based not only on the analysis of the current, but also in a simulated financial situation.

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