

Application of BSC to Management of Production Processes in the Analyzed Company

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Abstract. Financial analysis provides information for achieving quality results in assessing the efficiency of businesses. Business performance is analyzed from a few perspectives. When analyzing the retrospective view (ex-post), financial ratios such as ROA, ROE, liquidity ratios (stage I, II and III) are used... Ex-ante produces a prediction of the future performance of the business. In terms of the availability of information sources, we divide performance evaluation approaches into traditional and modern. The interconnection of the given approaches brings about an increase in the efficiency of business management. The aim of this paper is to show the practical implementation of the modern BSC method in the management of the enterprise.

Keywords: BSC, business performance, business management

JEL classification: B41, G2, M2

1 Literary researcher

Performance measurement is currently symptomatic. Measurement itself brings the possibility of finding a way to solve the problems of the enterprise. During the COVID-19 pandemic that has prevailed in the world, it is necessary to collect as much information as possible about the problem areas in the enterprise. The crisis has affected all departments, so the question of solving the problem of profitability is to guarantee sales in the future. The solution to guaranteeing economic profit is to pinpoint the optimal management decision. In a time of crisis in the world, it is necessary for managers to focus on collecting up-to-date data about the enterprise. Coping with crisis decision-making guarantees not only profit but also the preservation of employees' jobs.

In practice, this means that by looking for bottlenecks and how to solve them, the crisis manager can keep the business running. Accounting has up-to-date data on costs incurred, from which business management can deduce problems.

The financial analysis provides a summary overview of all business activities. In terms of time interval, it tracks the movement of costs incurred and income received. The flow of finance is analyzed from a retrospective (ex-post) and a prospective (ex-ante) perspective. The ex-post, a look into the past of the financing of the enterprise, defines the indicators that have acted positively or negatively on the enterprise. The nature of the factors is also assessed in terms of time, i.e., the duration of their impact. Certain principles must be observed in any analysis, and this is also true for ex ante and ex post financial analysis. Krařtová (2002) talk about the principles of efficiency, objectivity, comprehensiveness, applicability, correctness, and others. The common goal of all the principles is the realization of quality analysis. When the principles are followed, the analyst will exclude all unfavorable attributes of the analysis and can evaluate a realistic view of the financial side of the enterprise. Ex-post analysis is characterized using economic indicators of profitability, liquidity, indebtedness of the enterprise... Ex-ante analysis is referred to as a prediction of future development. By using economic indicators and methods it is possible to anticipate opportunities, threats that may arise in the future. [6] Bhavana (2021) confirms this and adds to it the idea that the future event of ex ante prediction is the returns that the enterprise can achieve. Ex ante uses data from financial statements (balance sheet, income statement, notes) that talk about the financial condition of the firm over the period under review. [1] Lesáková et al. (2007) supplement the standard methods, i.e., scoring methods, mathematical-statistical methods, evaluation of financial analysis prediction with multicriteria evaluation methods and neural network method. In his study, he presents a division of mathematical-statistical methods based on the number of indicators used into univariate and multivariate discriminant analysis. From the above findings, we conclude that the financial situation of a company and its prediction for the future depends on the key attribute of ex ante analysis, i.e., verbal and evidence-based results in the current period under study. The future depends on a well-conducted financial analysis of the enterprise. [7]

In the crisis of the outbreak of Covid-19, which was first reported in the world in March 2019, businesses cannot rely with certainty on ex post analyses. Table 1 summarizes approaches to assessing a company's financial analysis in terms of the availability of information sources.

Table 1: Methods of measuring business performance

Traditional	Modern
Liquidity ratios	BSC
Labor productivity indicators	EMA
Profit indicators (EAT, EBT, EBIT)	EVA
Profitability indicators (ROA, ROE, ROS)	MVA
Debt ratios	CFROI
Activity indicators	CAPM
	CROGA

Source: own processing according to Zalai et al. (2016) [12], Vřrostová (2014) [11]

The basic idea of traditional approaches is to focus on increasing the efficiency, the cost-effectiveness of enterprises. Modern methods bring a new perspective to the solution of the issue of minimizing or optimizing the performance of the enterprise. These are methods that can be approached from a few perspectives, e.g., technical, and technological equipment of the enterprise, personnel, ecological, social, or material aspects of the production process of the enterprise.

1.1 Balanced Scorecard (BSC)

The BSC method is a balanced scorecard system of evaluating the performance of a company based on the company's strategy. Durkáčová - Kalafusová (2012, p. 7) define BSC as: "a strategic and managerial system of evaluation and management of an enterprise, creating a link between strategies and operational activities, with an emphasis on performance measurability." [2] Németh (2017) refers to it as one of the most well-known conceptual frameworks for measuring business performance. [10] The method was developed and popularized by Kaplan and Norton in 1992. They consider the main purpose as striking a balance between financial and non-financial indicators in measuring business performance. The contribution of the BSC method is the extension of the financial indicators to other perspectives of the company's activities, namely the customer perspective, the internal business process perspective, the learning, and growth perspective as well as their interconnection, which are shown in Figure 1.

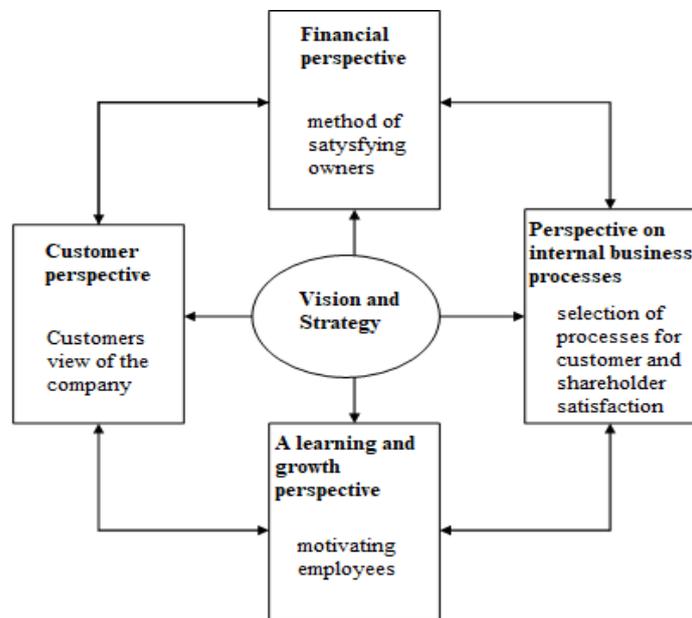


Figure 1: Evolution of the profitability of the undertaking concerned

Source: own processing according to Hudymačová -Hila (2011) [4]

Striking a balance requires that each perspective is given equal attention, only then can a balanced system of business performance indicators emerge. The balance between the indicators is also expressed by the direction of the arrows on the above Figure 1.

Table 2 groups together the most used indicators that are monitored when assessing the performance of an enterprise according to each perspective.

Table 2: Perspective indicators of the BSC method

Perspective BSC	Indicators
Financial perspective	value of revenues, cost of eating, profit growth, amount of inventories, time to achieve profitability, financing...
Perspective of internal business processes	machine failure rate, scrappiness, volume of deliveries, cycle time, quality of suppliers...
Prospects for learning and growth	employee qualifications, staff training, education efficiency, efficiency of job interviews, accident rate, stability of employees, staff turnover
Customer perspective	customer loyalty, acquiring a new customer, customer loyalty...

Source: own processing by Mišún et al. (2018) [9], Forman (2012) [3]

The qualitative BSC method takes an integrated approach. The method can be suitably combined with other qualitative and quantitative methods. The right combination, linking financial and non-financial indicators, contributes to the successful measurement and evaluation of business performance. Statistical methods, correlation, regression is used in practice to express this dependence of indicators (Jurkovič - Sosedová, 2011). [5]

The practical implementation of the BSC methodology in a company requires the creation of a preparatory team that has information about the company's production strategy. The team is familiar with the customer requirements and other key parties involved in the process. It is aware of the methodologies used in the management of the business to achieve quality and performance. The enterprise team further applies benchmarking to compare itself with competitors. Knows the structure, documentation and management system built. Finally, he/she knows the goals set by the business, whether directed towards the end customer or the business itself. The objectives of the enterprise must meet the SMART condition, i.e., the set objectives must be specified (S), measurable (M), achievable (A), realistic (R) and time-bound within a realistic view (T). Mihalčová - Faltus (2005) complements the basic structure of the BSC concept with the following four operations - formulation of strategic objectives with their specification, causal linking of objectives, determination of measurement tools and setting of target values, development of action plans. [8]

2 Results

The paper focuses on analyzing a manufacturing company involved in the production of modular systems. For this enterprise we have created a practical demonstration of the application of the BSC method, which highlights the essential elements and relationships that exist between the different perspectives. The main objective is to ensure that the mission of the enterprise is fulfilled with effective use of the strengths and opportunities, with an emphasis on minimizing the threats and weaknesses of the enterprise. We consider the vision to be to build a significantly improved market position in the production of module systems and to make efficient use of the technological capabilities of the enterprise.

2.1 Customer perspective

The company operates in Slovakia and abroad, namely in the countries of Germany, Belgium, the Netherlands, France, and the Czech Republic. The group of customers represents a wide range of. These are families interested in the production of modular systems for the construction of house buildings. Customers also include investors, entrepreneurs who perceive the modular system as a lower cost option for building their business branches. The company sees improving awareness (goodwill), business value and increasing customer satisfaction as its vision for the future from a customer perspective.

2.2 Financial perspective

The business maintains its profitability trend at a good level. Profits cover costs in full, except for small deviations. The profitability trend for the period 2010 to 2020 is shown in Figure 1.

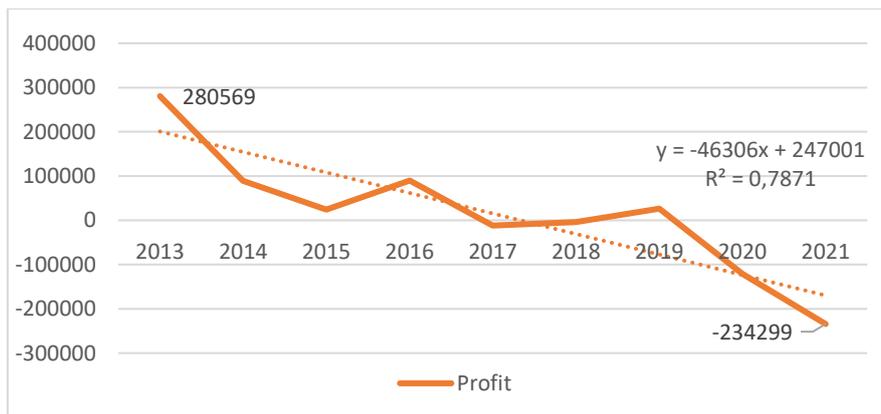


Figure 1: Evolution of the profitability of the undertaking concerned

Source: own processing.

For the period 2013 to 2021, 2013 was the best year for the company in terms of profitability. In that year, it made a profit of € 280 569. The evolution of profitability also shows the most significant decline in profitability, which is recorded during the pandemic period. Since the outbreak of COVID-19, the company has had a negative economic result. The situation has been addressed by using its reserves and contributions from the State to keep the company in the construction industry. The year 2021 is marked by the highest negative profitability, with a loss of € -234 299. This is the most significant decline in the company's history. The enterprise used financing of the type of short-term liabilities, namely short-term trade payables and short-term bank loans. The total indebtedness in 2021 reached 114.6 %. To maintain its position in the competitive market, the enterprise under review must look for solutions to improve its bottlenecks. Otherwise, it faces extinction.

Due to the critical situation of the company and its position on the market, we have used the prediction of the development of the return on assets ratio soon. For the analysis we have based on the calculated ROA values for the period of 2013-2021. The values of the prediction of the ROA indicator with UCL (Upper Control Limit) and LCL (Lower Control Limit) for the next period of 3 years are grouped in Table 3.

Table 3: ROA prediction values for the following period 2022-2024

Model		2022	2023	2024
ROA-Model_1	Forecast	-22,58	-28,39	-34,21
	UCL	5,61	-,07	-5,75
	LCL	-50,76	-56,71	-62,67

Source: own processing.

The prediction of ROA values is visually processed in Figure 2.

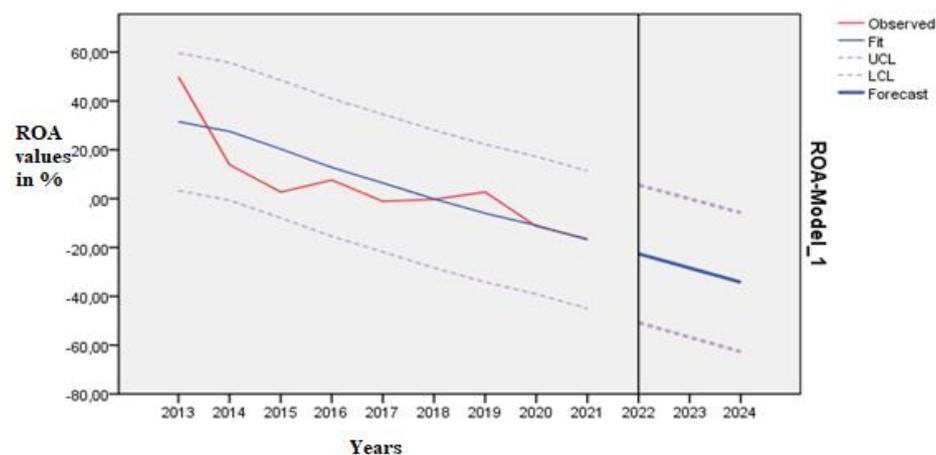


Figure 2: Forecast ROA in %

Source: own processing.

The reliability of the prediction of the development of ROA as a function of time is 65.8%, i.e., with a probability of almost 70% we can expect an inertial downward trend in the development of ROA for the next period from 2022 to 2024.

The downward trend in return on assets confirms our observation that the company does not have effective and efficient management. Consequently, we analyzed the inventories from which the company currently operates. The evolution of inventories over the period under review is visually processed in Figure 3.

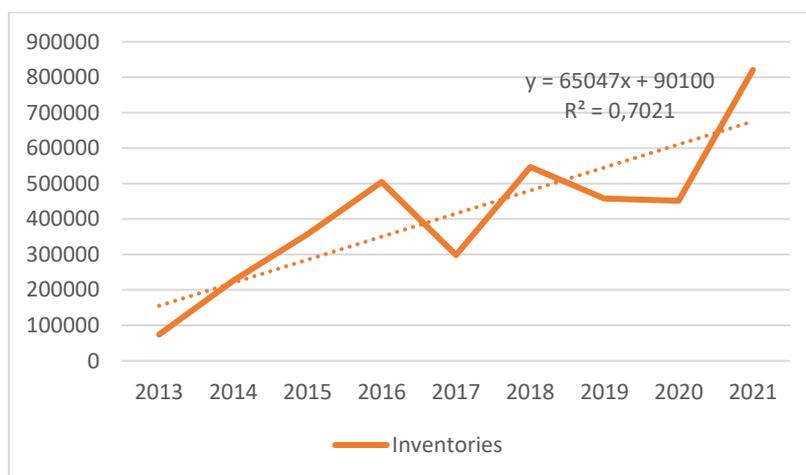


Figure 3: Inventory development

Source: own processing.

The value of the company's inventories in the period 2013 - 2021 has an increasing trend. The year 2017 brought a decrease compared to the previous year 2016. Since 2017, the stock has been rising again. It was only a short-term decline. In times of crisis, the company draws down its inventories, there is a risk that the inventories will not be sufficient in the future.

However, business management must recognize that drawing down inventories is not a sufficient solution to a crisis.

2.3 A learning and growth perspective

From a growth perspective, the company strives to regularly obtain quality certificates or certificates of authorization to operate. The most recent certificate acquired in 2019 is the certificate of conformity of products with the declared characteristics assessed according to the relevant ISO standards. It regularly trains its employees as the production process is innovated in terms of technological equipment. In addition to the employees involved in production, the company also provides training to the administrative and marketing departments. The growth in the skills of the workers will ultimately be reflected in the growth in the value of the enterprise.

2.4 Perspective on internal business processes

The perspectives of internal business processes can include the equipment of individual workshops, offices, the creation of an effective production plan and an incentive plan for employee evaluation. The technological aspect influences the overall production process of the module system, i.e., the overall lifetime value of the product. e.g., the equipment of the paint shop influences on the one hand the spraying of the individual module structures and on the other hand the health of the employees as well. The knowledge of the shortcomings guides the company to increase its attention to production control and to the development of a motivation plan for the employees.

2.5 Strategic Map

Having identified the essential elements of the individual perspectives, we can proceed to the actual creation of the strategic map. Figure 4 shows the strategic map we have created.

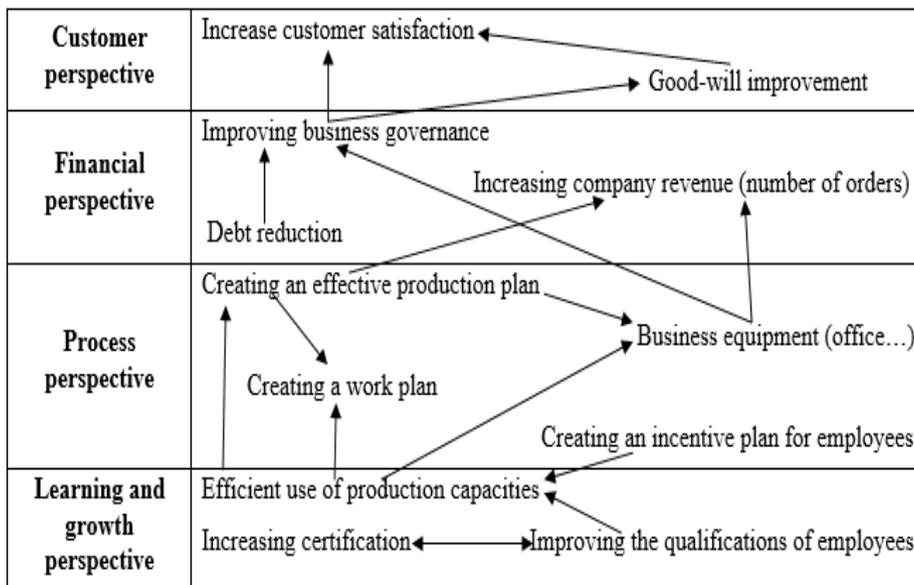


Figure 4: BSC model

Source: own processing.

The created BSC methodology strategic plan is the initial model that the enterprise can practically implement. Based on the correct creation of the BSC strategic map, the enterprise can better explain the causal relationships of the bottlenecks and at the same time improve its management.

In the crisis in which the enterprise finds itself, it is necessary for it to focus its attention on reducing its indebtedness and increasing the number of contracts that will guarantee it a profit.

3 Conclusion

Performance measurement is effective if we know the existing relationships between processes in the enterprise. Financial analysis is one of the methods that point out bottlenecks. Traditional methodologies are an effective tool for determining the origin of cost items. By supplementing traditional methods with modern ones, an enterprise gets a picture of the bottleneck location and can clarify its cause. Consistency between traditional and modern analyses is an opportunity for an enterprise to maintain its position in the construction market, gaining a competitive advantage. In this paper, we have pointed out the incorporation of modern BSC method into enterprise management. The proposed strategy map explains the connections between the elements of each perspective of the analyzed enterprise. We recommend the enterprise to pay more attention to the interconnectedness of traditional and modern methods of cost analysis in times of crisis. Overview and definition of the causes of problems helps to prevent the growth of expenses in the enterprise. Based on visualization of essential elements in the perspectives and their analysis, the manager identifies significant problem areas that need to be improved to increase the performance of the enterprise.

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