Cost Strategy Impact on Development and Success of Croatian Metal Processing Industry

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Abstract: Cost strategy management has one of the most important roles in enterprises and industry. Croatian metal processing industry is a branch of processing which is of the biggest influence on the economy. According to this paper, the research is conducted with a goal to improve the competitive position and to give recommendations for development and strategic turnover in future years. Therefore, this paper cost strategy analysis has a purpose to improve the position of small, medium and large enterprises. The survey was conducted on 508 enterprises in metal processing industry in three sectors according to NKD 2007 (C24, C25 and C28). Main goal of this paper is to research the connection between cost strategy and its impact on development, success and achieving competitive advantage. For statistical analysis statistical program SPSS is used (version 16.0, SPSS Inc., Chicago, IL, USA).

Keywords: competitiveness; cost; enterprise; metal processing industry; strategy

1 INTRODUCTION

The metal processing industry (MPI) is part of manufacturing industry that has historically and nowadays had a significant influence on the Croatian economy and its development. In 1970s, it was one of the most developed industries, but now it is undeveloped, because of bad transition process and lack of investments. Nowadays, achieving competitive advantage is one of the main laws of the economy, while strategy is a pathway for achieving the competitive advantage. Strategic models are used to improve the business development, operations and management of enterprises in metal processing industry. The paper presents the ways in which enterprises can solve low level of competitiveness. It is important to conduct systematic research and analysis of MPI, as well as theoretical analysis of strategic methods and models that will contribute to economic prosperity.

2 COSTS IN PRODUCTION

For production, success and delivery of each functional needs' coats are the most significant element in global and highly competitive market. Production is a strategic tool and the most important element for industrial development, the same as the development of economy globally. Production is a process where low value products (inputs) are converted in final products (outputs). To achieve competitive advantage, enterprises have to increase product variety, products and their quality, novelty and flexibility. Due to increasingly required elements, it is also important for enterprises to reduce costs constantly. Therefore, cost management in manufacturing should reduce short- and long-term costs of production.

Enterprises, which do not have cost analysis and cost predictions, have higher costs than enterprises that have completed estimation of costs.

"Companies that are unable to provide detailed and meaningful cost estimates at the early development phases have a significantly higher percentage of programs behind schedule and with higher development costs than those that can provide completed cost estimates", [1].

In cost management, accounting is the main source of information, where financial accounting focuses on external needs and cost accounting focuses on preparing information for the preparation of financial and accounting reports in financial accounting. Cost accounting information uses estimation in the value of inventories, determining the cost of goods and services, compiling financial statements, planning and control, and preparing all types of business decisions. Cost management as part of the overall process of managing the business success of the company includes all the procedures by which the relationship between costs and benefits is assessed in the company business. In order to achieve the long-term goal or maximize profits, it is not necessary to reduce costs at any cost, but the purpose is to undertake activities that, although they create costs, ensure a permanently profitable business. In the business of economic entities, a part of the costs is considered as an unnecessary reduction of the financial result. It is therefore important to ensure to measure the costs and records, in order to identify and eliminate unnecessary costs.

It is also possible to reduce the cost of materials by finding a more favourable supplier. Of course, it is always important to consider the ratio of price and quality of raw materials that we use for production in order to minimize the creation of scrap.

3 STRATEGY AND COMPETITIVE ADVANTAGE ACHIEVEMENT

Because of globalization, enterprises face market changes. Customer needs to change the same as the nature of markets. For reaching a competitive advantage, enterprises need to improve their performances, "they have to develop new products and strategies to attract new customers and satisfy existing ones", [2]. Gaining of competitive advantage and globalization are main challenges of modern business. "Nowadays, globalization, high competition and a shift towards the buyers' market are some of the main challenges faced by the manufacturing industry", [3]. Flexible and effective processes of manufacturing in modern times are foundation for everyday business success. Buyers look for high-quality products that are customized and innovative and have good price at the same time.

In defining a successful strategy according to Weihrich and Koontz (1998), there are three key questions to answer:

where the enterprise is now, where it wants to go and how to reach the desired goal [4].

According to author Buble (2005), the implementation of a strategy is to achieve harmony between the ways of achieving goals and objectives. It is important to harmonize the defined strategy with the organizational possibilities, the culture within the organization, the reward system, etc. [5].

Competitive advantage is what sets a company apart from the rest of the competitors in the market. It is the reason why enterprise operates. "Competitive advantage can also be found under various names such as: unique sales position, recognisability, favourable competitive position, discrimination, and differentiation", [6]. The big disadvantage of most enterprises is that they do not take full advantage of their competitive advantages. Sometimes a company thinks it has a competitive advantage and is not aware that it does not have it. The second case is that it has a strong competitive advantage that it does not know and fails to promote in front of users of its services or goods. Often an enterprise, especially if it is a small or medium-sized enterprise, does not even know how to list its competitive advantages, which should be the basis of all strategic and operational decisions.

"The first fundamental determinant of a company's profitability is the attractiveness of the industry. Competitive strategy must arise from a sophisticated understanding of the competition rules that determine the attractiveness of an industry. The ultimate goal of a competitive strategy is to deal with these rules and ideally to change them in favour of the company", [7].

Strategy and competitive advantage are two interrelated concepts. Company cannot talk about creating a competitive advantage if it does not have a defined strategy in advance. The strategy cannot be defined if the direction of the company's movement is not familiar, i.e. the guidelines where the company wants to go and which markets competitive position it wants to achieve. The role of strategy is extremely important in gaining a competitive position of the company.

This paper presents ways in which to achieve competitive advantage through the application of functional strategies, but also changing strategies. Depending on its activity, the company is establishing functions. The basis are their functions, so company should have a set of strategies for each individual function, which are all in line with the general strategy of the company. If the existing business does not create success and a competitive position in the market, then the company has to make certain changes in the way of doing business, or should notice some of change strategies depending on the degree and strength of the change that it wants to implement. This strategic approach should be applied in the metal processing industry, because many branches and segments of this industry are unprofitable and unsuccessful, but despite poor business indicators, companies do not create change. "However, the typical constraints faced by small and medium enterprises are: (1), the lack of capital; (2) difficulties in procuring raw materials; (3) lack of access to relevant business information; (4) challenges in marketing and distribution; (5) the low technological capabilities. Furthermore, the constraints are (6) high transportation costs (7)

communication problems; (8) problems caused by cumbersome and costly bureaucratic procedures, especially in getting the required licenses; (9) policies and regulations that generate market distortions", [2]. Changes can further improve successful businesses to make them even more successful, but they can also make a turnaround of unsuccessful businesses. For reaching of international success, enterprises require competitiveness. To be competitive includes elements such as price, marketing efficiency logistics, technology, packaging and so on. For achieving competitiveness essential are elements such as structure, productivity and innovation. "The economic doctrines have generated and made contributions to the concept of competitiveness used today", [8]. All strategies must be evaluated in order to determine the success of strategy implementation. The Balanced Score card (BSC) method is a tool for measuring a company's performance through strategic goals. This method is almost unknown to domestic managers and entrepreneurs, who largely neglect strategic planning. BSC contains four elements.

Terms of competitiveness and competition are most often defined at the entrepreneurial level. Company is competitive when it can create products or services that have cost leadership in comparison with rivals and better quality. Competitiveness of company encompasses three main dimensions: better quality, relative performance and cost efficiency. Industry competitiveness can be defined the same way as single enterprise competitiveness. "However, industrial competitiveness inevitably involves a territorial dimension", [9].

This paper presents several basic forms of strategic options, which companies in the metal processing industry could apply to improve their market position.

4 METAL PROCESSING INDUSTRY IN THE REPUBLIC OF CROATIA

Structure is very important for analysis of metal processing industry. Capital goods are essential for production process in MPI, because the base of production are materials. Intangible assets are also present and needed, through patents, licenses, CNC machine tools, etc. Constant investment is required - both tangible and intangible assets, but the outputs are always finished tangible metal products. "These systems are characterized by their high life cycle costs a large part of which are generated during their exploitation phase", [10]. In addition "the technology is regarded as a pathway to digitise production, production on demand and rethink product design", [11].

Metal processing industry is classified as C sector according to National Classification of Activities 2007 (NKD 2007). It includes activities of the processing industry that is specialised and transformation and production of raw materials into a new product. Classifying activities might be ambiguity boundary between processing industry and other areas of the classification system [12]. That classification has been valid since 2008, because before other terminology was used MPI sector structures of three different areas according to this research:
• C24 Production of basic metals

- C25 Production of fabricated metal products, except machinery and equipment
- C28 Production of machinery and equipment

Area C24 involves the smelting of ferrous and undesirable metals from ore, pieces or waste, using electrometallurgical or other metallurgical processing technology. This section covers production of metal alloys into pure metals. "The final product of metal smelting and refining is form of ingots and is usually used in drawing, rolling and coating processes for producing of sheets, strips, rods, rods or wires or in molten form to make basic metal products" [13].

Activity C24 - Production of basic metals includes the following subsectors:
- "C24.1 includes the production of iron, steel and ferroalloys
- C24.2 production of steel tubes
- C24.3 production of other primary steel products
- C24.4 production of other non-ferrous metals
- C24.5 metal casting [13]"

Activity C25 involves the production of many products that originate from metal (e.g. metal parts, structures, etc.). Those products usually have a static and stationary function, and are opposed to those in sections from 26 to 30, which deal with the combination and assembly of metal products (woods, plastics and other materials) create complex units, which, if not fully electric, electronic or optical, also work with moving parts.

Activity C25 - production of fabricated metal products, except machinery and equipment includes:
- "C25.1 production of metal structures
- C25.2 production of tanks, reservoirs and containers of metal
- C25.3 production of steam boilers,
- C25.4 production of weapons and ammunition
- C25.5 forging, pressing, stamping and roll forming of metal, powder metallurgy
- C25.6 metal processing and coating, metal machining
- C25.7 production of cutlery, tools and general hardware
- C25.9 production of other finished metal products [13]"

Sector C28 involves the production of machines and apparatus. This section includes portable (mobile) and fixed devices, whether intended for use in industry, construction, agriculture or in the household. The production of special devices for the carriage of passengers or cargo within a predetermined demarcation also belongs to this section. There is a difference between production of special purpose machines, i.e. machines used exclusively in the manufacturing industry of the NKD classification or in small groups of the NKD classification, and general-purpose machines, i.e. used in various industries of the NKD classification. "C28 includes special purpose machines, which are not included anywhere else in the classification whether or not they are used in production processes such as outdoor entertainment devices (amusement park, etc.), automated bowling alley equipment, etc.", [14].

Activity C28 - production of machinery and equipment. The following subsectors are:
- "C-28.1 Production of general-purpose machinery
- C-28.2 Production of other general-purpose machinery

- C-28.3 Production of agricultural and forestry machinery
- C-28.4 Production of metalworking machinery and machine tools
- C-28.9 Production of other special-purpose machinery", [14].

Nowadays, one of the main problems is sustainable production in the world. Leading economies constantly are growing and becoming more attractive as a base for production. "That is, how to manage resource shortage, reduce non-value-added activities, mitigate environmental degradation and destruction of the greatest soft potentials of human beings. Manufacturing plays a vital role in emerging economies growth and exports", [15].

5 RESEARCH

Companies that consistently implement a cost strategy are more successful in the metalworking industry. "The problem of industrial enterprises competitiveness increasing is currently one of the most urgent fundamental and applied research tasks in the economy", [16].

"Currently, no proper cost models are available to assist managers in selecting part-specific allocation strategies for spare parts under consideration of metal additive manufacturing", [17].

To test the hypothesis that firms that consistently implement a cost strategy are more successful in the metalworking industry, the Spearman's correlation coefficient (SCC) will be used. SCC is the nonparametric equivalent of Pearson's correlation coefficient of costs with other parameters that follow as credit rating, establishment year, board members, total income, total expenses, Earnings before Interest Tax Depreciation (EBITDA), Earnings before interest and taxes (EBIT). Then, Earnings before taxes (EBT), profit tax, net profit, newly created value, productivity, money, exports and imports, assets/liabilities, long-term and current assets, capital and reserves, current liquidity ratio. Furthermore, Altman Z score, days of receivables and liabilities in days, operating margin, and cash cycle in days, Return on equity (ROE), Return on assets (ROA), income per employee and net profit per employee).

For the paper research, there are steeled two assumptions that follow:

H1.1: there is no correlation between total expenses and average net salary per employee and other parameters,

H1.2: there is a correlation between total expenditures or average net salary per employee and other parameters.

Significance level of the test was set to $\rho = 0.05$. If significance of the test is less than 5% assumption H1.1 will be rejected and alternative assumption H1.2 will be accepted, i.e. there will be a significant correlation of total expenditures or average net salary and observed parameters. If the significance is higher than 5%, H1.2 will be rejected and H1.1 will be accepted, i.e. no statistically significant correlation between total expenditures or average net salary and the observed parameters will be proven.

First is correlation analysis, second a univariate and multivariate regression analysis will be performed to see how much impact each of the predictors has on total expenditures and average net salary, and then the impact of the model.

Table 1 Spearman's coefficient of correlation of total expenditures and average net salary with the observed parameters (made by author)

	Spearman's coefficient (Rho)			
	Total expense		Average net salary	
	Rho(ρ)	p	Rho(ρ)	p
Average net salary	0.723	< 0.001		
Credit rating	−0.425	< 0.001	−0.360	< 0.001
Year of foundation	−0.305	< 0.001	−0.229	< 0.001
Number of board members	0.319	< 0.001	0.236	< 0.001
EBITDA	0.685	< 0.001	0.484	< 0.001
EBIT	0.584	< 0.001	0.418	< 0.001
EBT	0.582	< 0.001	0.421	< 0.001
Profit tax	0.473	< 0.001	0.391	< 0.001
Net profit	0.574	< 0.001	0.414	< 0.001
Newly created value	0.941	< 0.001	0.774	< 0.001
Productivity	0.607	< 0.001	0.833	< 0.001
Net working capital	0.459	< 0.001	0.334	< 0.001
Money	0.707	< 0.001	0.553	< 0.001
Trade receivables	0.857	< 0.001	0.574	< 0.001
Commitments towards suppliers	0.840	< 0.001	0.535	< 0.001
Export	0.770	< 0.001	0.556	< 0.001
Import	0.673	< 0.001	0.479	< 0.001
Total assets/liabilities	0.885	< 0.001	0.583	< 0.001
Fixed assets	0.795	< 0.001	0.507	< 0.001
Current assets	0.905	< 0.001	0.624	< 0.001
Capital and reserves	0.772	< 0.001	0.543	< 0.001
Current ratio	0.209	< 0.001	0.217	< 0.001
Altman Z score	0.205	< 0.001	0.249	< 0.001
Receivables binding days (days)	−0.197	< 0.001	−0.219	< 0.001
Commitment days (days)	−0.086	0.043	−0.147	0.001
Operating margin	0.160	< 0.001	0.120	0.008
ROE	0.147	0.001	0.146	0.001
ROA	0.262	< 0.001	0.253	< 0.001
Income per employee (HRK)	0.647	< 0.001	0.527	< 0.001
Net profit per employee (in HRK)	0.285	< 0.001	0.194	< 0.001

The correlation of total expenditures with all the parameters shows that all statistically observed parameters correlate significantly. The highest level of correlation is shown by the components of newly created value (ρ = 0.941), trade receivables (ρ = 0.857), trade payables (ρ = 0.840), total assets/liabilities (ρ = 0.885) and current assets (ρ = 0.905). The weakest correlation is shown by the rate of return on equity (ROE) (ρ = 0.147).

The correlation of the average net salary with the observed parameters shows that all statistical parameters also significantly correlate with the observed parameters. The highest level of correlation is shown by productivity (ρ = 0.833), newly created value (ρ = 0.774), and the value of current assets (ρ = 0.624).

The weakest correlation is the correlation with net profit per employee (ρ = 0.194). Negative correlations of total expenses or average net salary are with the credit rating, establishment year, liabilities and days of receivables.

Spearman's correlation coefficient gives an estimate of the relationship between the number of employees and the observed parameters. A correlation (greater than 0.500) of the average net salary or total expenditures with most parameters has been demonstrated. As the correlation coefficient (Rho) ρ > 0.500 and the significance is less than 0.05, the assumption H3.2 accepts that there is a significant correlation of total expenditures or average net salary with the observed parameters.

The data from the research have confirmed the hypothesis.

In order to avoid erroneous signs of regression coefficients, the statistical insignificance of some independent variables that are actually significant in relation to the dependent variables (total expenditures and average net salary), and vice versa, independent variables that strongly correlate with each other are excluded from further analysis.

Table 2 Correlation table of all parameters (author's work)

The variables for univariate analysis remain credit rating, number of members of the management board, profit tax, productivity, money, trade receivables, imports, current liquidity ratio, Altman Z score, and income per employee and net profit per employee. Total expenses significantly affect the credit rating, the number of members of the management board, profit tax, productivity, money, trade receivables, and imports and revenue per employee. The average net salary mostly affects the credit rating, number of members of the management board, productivity, money, trade receivables, and income per employee and net profit per employee (Tab. 3 and Tab. 4).

Tab. 3 Individual influence of parameters on the change of total expenditures - univariate regression analysis (author's work).

Table 3 Individual influence of parameters on the change of total expenditures - univariate regression analysis (author's work)

Parameter	Standardized Coefficient β	t	p
Credit rating	−0.128	−2.758	0.006
Number of board members	0.338	7.653	< 0.001
Profit tax	0.211	4.861	< 0.001
Productivity	0.122	2.525	0.012
Money	0.561	15.261	< 0.001
Trade receivables	0.731	24.082	< 0.001
Import	0.825	32.868	< 0.001
Current ratio	−0.033	−0.730	0.465
Altman Z score	0.015	0.340	0.734
Income per employee (HRK)	0.215	4.486	< 0.001
Net profit per employee (in HRK)	0.009	0.174	0.862

Table 4 Individual influence of parameters on the change of average net salary - univariate regression analysis (author's work)

Parameter	Standardized Coefficient β	t	p
Credit rating	−0.307	−6.876	< 0.001
Number of board members	0.157	3.380	0.001
Profit tax	0.076	1.718	0.086
Productivity	0.694	19.896	< 0.001
Money	0.118	2.674	0.008
Trade receivables	0.158	3.598	< 0.001
Import	0.079	1.778	0.076
Current ratio	−0.045	−1.003	0.316
Altman Z score	0.003	0.074	0.941
Income per employee (HRK)	0.565	13.951	< 0.001
Net profit per employee (in HRK)	−0.828	−29.96	< 0.001

Predictors that are significant (credit rating, number of board members, profit tax, productivity, money, trade receivables, and imports and revenue per employee) are observed as the model that has the greatest impact on total expenses.

Table 5 Final model of the impact on the change in total expenditures - multivariate regression analysis (author's work)

Parameter	Standardized Coefficient β	t	p
Number of board members	0.103	3.988	< 0.001
Money	0.144	5.091	< 0.001
Trade receivables	0.321	10.444	< 0.001
Import	0.541	16.973	< 0.001
Constant		−1.85	0.065

$R = 0.890$; $R^2 = 0.793$; $R^2 = 0.791$; $p < 0.001$

Finally, a model with four independent predictors was obtained, which is entirely statistically significant, $p < 0.001$ and fully explains 79.3% of the variance of total expenditures, and a correction of 79.1%. Only four independent predictors made a unique statistically significant contribution to the model (number of board members, money, trade receivables, and imports). The strongest predictor is imports ($\rho = 0.541$) (Tab. 5).

Table 6 Final model of the impact on the change in the average net salary - multivariate regression analysis

Parameter	Standardized Coefficient β	t	p
Credit rating	−0.139	−3.374	0.001
Number of board members	0.081	2.097	0.037
Productivity	0.749	15.84	< 0.001
Trade receivables	0.183	4.696	< 0.001
Net profit per employee (in HRK)	−0.524	−11.08	< 0.001
Constant		11.88	< 0.001

$R = 0.725$; $R^2 = 0.525$; $R^2 = 0.519$; $p < 0.001$

Finally, a model was obtained, which is entirely statistically significant, $p < 0.001$ and fully explains 52.5% of the variance of the average net salary, and a correction of 51.9%. Five independent predictors made a unique statistically significant contribution to the model (credit rating, number of board members, trade receivables, productivity and net profit per employee). The strongest predictor affecting the average monthly wage is productivity ($\rho = 0.749$) (Tab. 6).

6 CONCLUSION

Successful cost management is one of the most important strategic elements that companies implement in their business. Cost control is a better option than reducing costs because as the volume of business increases, the company's costs increase and it is necessary to control costs in order to get an accurate insight into the company's finances and to see at any time which costs to increase and reduce. Hypothesis based on statistical analysis correlates the cost variable with other indicators in the sample of enterprises in order to analyse the relationship of cost strategy with the performance of enterprises in the MPI. The research and its results used a sample of 508 companies, so it concludes the hypothesis: companies that consistently implement a cost strategy are more successful in the metalworking industry.

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