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MODERN UNDERSTANDING OF BUSINESS MODEL ANALYSIS OF CROATIAN HOTEL COMPANIES BASED ON FINANCIAL ANALYSIS

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Abstract
Because of the large share of travel and tourism revenues in total Croatian GDP, it is worth noting the importance of the hotel industry for the Croatian economy. Therefore, the problem that arises from such an obvious and increasing dependence of our economy on the hotel industry is primarily focused on the sustainability of business models of hotel companies in order to create the preconditions for their successful long-term business operations.

Therefore, there is a need to monitor quality of business models that will lead to satisfactory financial results and determine the level of improvement of individual parts of business models significant for the hotel industry for the purpose of defining the quantity, type and source of financing of the necessary investments in the development of key resources and key activities.

The paper analyses financial data and indicators on a selected sample using self-organising neural networks (SOM). The analysis points to the fact that it is possible to determine indicators by which the business model of hotel companies can be evaluated with respect to the quantities, types and sources of financing needed for the development of key resources and key activities.

Keywords: business model, financial indicators, self-organising neural networks.

Jel Classification: L21; L25; L53; M21

INTRODUCTION

The idea of the existence and importance of business models in economic theory emerged in the 1950s, while the idea of innovative and unique business models that create

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competitive advantages for the company is more recent (the subject of recent economic research) and more attention has been devoted to their development and application in the last ten to fifteen years (Brlecic Valcic and Ivancic 2017). One of the most cited definitions (Drucker 1994) defines business models as "business theory" considering what the users of a particular product or service value and praise the most and the way businesses define revenue. Mutual co-operation and business relationships of all business partners should be recognised as an advantage in business because a large number of providers, customers, and intermediaries create value for customers (Zott, Amit, and Massa 2011).

Business models are often linked to an economic and organisational perspective where the organisational perspective is focused on studying the process of resource allocation with the aim of identifying market opportunities and creating added value, while the economic perspective deals with the cost structure and sources of income, i.e. the essence of profit generation (Dimitric, Tomas Zivkovic, and Arbula Blecic 2019). Also, the business model presents a description of the value that the business creates, the way a business is organised to create and distribute value, and profitability generated from creating and distributing value. It is important to emphasise that, regardless of differences in individual segments, all definitions have certain common facts, such as that each business uses business models, consciously or unconsciously (Milovanovic et al. 2016).

Quality relationships with customers, suppliers, and creditors, bonuses for employees and managers, as well as secure returns to investors are ensured when business policies and strategies are aligned with the purpose of the business and the capacity of the company in a competitive environment (Brlecic Valcic 2015).

Lately, the focus of economic theory has been on the importance of creating innovative business models that companies use to gain advantage over other businesses. Therefore, they can also be viewed as a platform for value creation and preservation (Zott, Amit, and Massa 2011), which ultimately results in value creation through various activities, defined by a series of company activities from the beginning of the business process to the satisfaction of the end consumer. The elements of these activities are mainly: value proposition, target markets, value chains, revenue mechanisms, value networks, and competitive strategies. Innovative business models should lead to the recognition and reconciliation of these factors in the context of increasing organisational efficiency, which can benefit the company in terms of cost savings, customer demand, loyalty and trust, supply chains and commitment to innovation, which ultimately leads to business sustainability, regardless of the technological advantage of another company (Zott, Amit, and Massa 2011).

Components related to business efficiency, management quality and choosing the right strategy that will successfully balance the growth and development of the company are the basis of any well-established business model.

According to the data issued by the Croatian National Bank, revenues from foreign tourists who visited Croatia in 2017 reached €9,493 bn, which means an increase of 10% or €858 m compared to 2016 (€8, 635 bn). In the last quarter of 2017, i.e. in October, November, and December, the revenues from tourism were €807 m, which shows a 10%-increase or a 74 million-euro-growth, compared to the same period of the previous year (733 million euros). The share of travel and tourism in the total GDP in 2017 was 0.7%,

in relation to 2016. In the last quarter, this share in GDP was 6.7%, or, in other words, there was a 0.3% share growth.

It is, therefore, undoubtful that these data signify large investments into the Croatian hotel industry. However, the problem, which has become obvious from this increasing dependence of our economy on the hotel industry, referrs to the sustainability of the hotel business models, and its aim is to create the prerequisites that will enable them to be successful and survive for a long time.

In the context of creating and sustaining competitive advantage and in order to create satisfactory economic rent, the question was raised in the hotel industry whether it was cost-effective to invest in a higher hotel category. It depends on the ratio between the investment and the business result achieved. This definitely requires examining how much it affects customer satisfaction and occupancy rate, as well as the hotel location, which, on the other hand, leads to the importance of ″revenue management″ in the business models of this type of industry. Revenue management may be defined as a system process designed to increase the revenues with respect to demand, booking distribution, and price change, and it incorporates the analytical process of anticipating the customers' behaviour at the micro-market level. It primarily referrs to activities conducted in order to understand the clients and learn how they perceive the product or service value, and adjust the price of the product and its availability to each business segment accordingly. For all these reasons, revenue management has found its place in the hotel industry.

Recently, the modern concepts of understanding business models have shifted the emphasis from the importance of the business models themselves to their innovation.

Based on the selected sample of hotels in Croatia analysed by using self-organising neural networks (SOM), it was shown that all of the above can be examined and assessed by a combination of financial parametres. The analysis of balance sheet and profit and loss account items show the importance of items such as: fixed assets, facilities, total assets, equity, stock, non-current financial liabilities, and staff expenses or, in other words, they indicate the basic principles of “revenue management” in the Croatian hotel industry.

1. THE IMPORTANCE OF THE DEFINITION OF BUSINESS MODELS IN THE NEW ECONOMY

In recent years, the term “business model” has become increasingly important, but since its inception it has often been misinterpreted and not been used extensively in practice and science. Also, the term “business model” has often been identified with popular terms in management (managerial) literature such as: strategy, business concept, revenue model, economic model, or even business process modeling (DaSilva and Trkman 2014).

Although it has become very fashionable to discuss business models, many CEOs are confused when they need to apply the concept. In a research conducted by Linder and Cantrell (2000), where 70 CEOs from 40 companies were interviewed, 62% of them did not know how to explain the business model of their company. The importance of business models and business model innovation was highlighted by IBM's research (IBM Global Business Services 2006) in which IBM consultants interviewed 765 corporate and public sector leaders around the world and found that companies that had better

financial results put twice as much emphasis on innovation in the business model than those that did not. The most important innovation of the business model according to their research is manifested in the mutual co-operation between companies; since global connectivity has reduced transaction and collaboration costs, companies need to leverage their expertise beyond the borders of their organisations.

Shafer, Smith, and Linder (2005) point out in their work that business models can actually play a positive and powerful role in corporate management. They define the business model as a representation of the company's underlying logic and strategic decisions to create and retain value within the value network. Accordingly, they classified business model components into four basic categories: strategic decisions, value networking, value creation, and value retention.

According to Hamel (2000), value creation and retention occur within a value network, which may include suppliers, partners, distribution channels, and coalitions that extend the company's own resources. A company can create unique relationships with anyone within the value chain and even with end customers (Milovanovic et al. 2016). The role that a company chooses in its value network is an important element of its business model.

When we talk about "business models", we can talk about three different things (Linder and Cantrell 2000): components of business models, real operating business models, and what we call "change models". Strictly speaking, a business model is organisational core logic of a value creation; it explains how a business makes money. As businesses compete for customers and resources, a good business model emphasises specific activities and approaches that enable the company to attract customers, employees, and investors and deliver products and services profitably (Aljinovic Barac, Vuko, and Sodan 2017). The change model describes how a company adapts to changes in the environment in order to maintain profitability. Operating business models create the basic assets (assets), capabilities, business relationships, and knowledge, while the change models expand and influence them. The ability to differentiate these models and communication between them will contribute to improvements within the company, establishing a fast competitive framework and will also position the company to thrive despite changes in the industry (Moric Milovanovic et al. 2017).

Modern views on innovation in business models refer to the three main points (Sorescu 2017):

- it does not have to be about product innovation, a change rather needs to be generated in value creation, appropriating the value or value of the enterprise delivery function that would result in a significant improvement in the overall company value,
- can be reflected in the process of collecting, organising and summarising environmental data, with the aim of streamlining business processes and increasing the likelihood of identifying consumer needs, and
- can be reflected in the process of collecting, organising and summarising internal data with the aim of improving the productional or serviceable range and better promotional offers.

In the context of using the data collected, whether from the environment or internal processes, the concepts of innovative business models also advise sharing of business

information within the so-called „sharing economy". In this way, the connection between customers and earnings is recognised within the framework of "new" and "old" views towards promising business orientations (Baden-Fuller and Mangematin 2013).

The pioneers of the modern, often used approach of the business models are Osterwalder and Pigneur (2010). According to the above authors, to understand the essence of a successful business model, it is necessary to understand its four basic components:

- Customer value – the value created for the customer by the product or service that the company offers,
- Profit formula – a blueprint that defines how a company creates value for itself while delivering value to the customer – it is made of a number of economic components, including: revenue model, cost structures, margin model, and rate of return on assets,
- Key resources such as employees, technology, products, equipment, sales channels, brand, etc. and
- Key processes characterised by management or operational processes.

These four components are evident in connecting the elements through nine interconnected units (Osterwalder and Pigneur 2010): customer segments, value proposition, delivery channel, reletionship, revenue stream, value configuration, capability, business partners network, and cost structure.

2. DATA SET AND METHODOLOGY

The analysis of determinants of the business models of Croatian hotel companies was performed on a selected sample of financial data and indicators of 76 Croatian hotel companies in the period from 2014 to 2017. Financial data refer to all items in the balance sheet of selected companies and to operating revenue, operating expenses (excluding depreciation), depreciation, net profit, cash flow from operating activities, cash flow from investing activity, cash flow from financial activity, and net cash flow.

Business indicators analysed based on the same selected sample are presented in Table 1 (created by the authors).

Table 1. Selected Financial Indicators for Analysis

1	capex / depreciation	24	Current assets turnover ratio
2	ex 1 – profitability	25	Days of collection of receivables
3	ex 2 - value creation	26	Stock tying days
4	ex 3 – liquidity	27	Paying days to suppliers
5	ex 4 - financial strength	28	Money conversion days
6	BEX index	29	EBITDA margin
7	Current liquidity ratio	30	EBIT margin
8	Quick ratio	31	Net margin
9	Current ratio	32	ROE
10	Degree of coverage I	33	ROA
7	Current liquidity ratio	30	EBIT margin

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Table 1. (*continued*)

11	Degree of coverage II	34	Return on invested capital
12	Monetary coverage of operating expenses	35	Economics of overall (uninterrupted) business
12	Self-financing ratio	36	Cost effectiveness of business activities
14	Financing ratio	37	Cost effectiveness of financial activities
15	Interest coverage from EBITDA	38	Coefficient of investment
16	Interest coverage from EBIT	39	Asset renewal ratio
17	Debt factor	40	The write-off rate of fixed assets
18	Coverage of total liabilities from EBITDA	41	Capital Expenditures to Depreciation Ratio
19	Short-term liabilities coverage	42	Number of employees
20	Years of interest bearing debt repayment	43	Business revenue per employee
21	Average interest expense	44	Net profit / loss per employee
22	Total assets turnover ratio	45	Average monthly gross earnings
23	Turnover ratio of fixed tangible assets,	46	Average monthly net earnings
		47	Share of staff expenses in operating income

In addition to the standard financial indicators, the BEX Index with all its elements was used in the analysis. The BEX Index is defined by four influence-weighted indicators according to the following expression (Belak 2014):

$$BEX = 0.388 \times ex1 + 0.579 \times ex2 + 0.153 \times ex3 + 0.316 \times ex4 \quad (1)$$

where *ex*1 is the profitability indicator; *ex*2 is the value creation indicator; *ex*3 is the liquidity indicator; and *ex*4 is the financial strength indicator, defined as follows:

ex1 = EBIT ⁄ (total asset),

ex2 = (income after tax) ⁄ (equity × price),

ex3 = (working capital) ⁄ (total assets),

ex4 = 5 × (income + depreciation + amortisation) ⁄ (total liabilities).

According to BEX Index values, companies fall into the following categories:

- good companies with a BEX Index higher than 1,
- companies with a BEX Index between 0 and 1, in need of improvements in their business operations, and
- companies with a BEX Index lower that 0, whose existence is threatened (Brlecic Valcic and Bagaric 2017).

Self-organising neural networks (SOM) and trend analysis were used in the analysis of the selected data.

The basic feature of Self-OrganizingMap (SOM) is that training data are available only as inputs, with no desirable outputs, that is, there is no information about what value certain outputs should have for individual inputs. According to these features, the SOM is one of the networks operating on the principle of unsupervised learning, i.e., there is no teacher involved in the learning process. Such a learning system is based on the principle of organising neurons within the human brain. Their goal is to achieve learning speed. The network itself must discover the pattern, category and determine the correlations in the input data. This type of learning is applicable to data analysis, classification of objects or patterns, feature mapping, and more (Loncaric 2018). SOMs are based on the concept of bilayer neural networks, i.e. in which the connections between input-output layer neurons have their respective weight (Huysmans et al. 2006). However, unlike other artificial neural networks that use error correction learning, they apply competitive learning.

Neural networks proved to be effective in modeling complex, non-linear processes where conventional methods cannot be applied due to the extreme complexity of the input and output link (Zekic-Susac et al. 2018). They also proved to be a very useful tool in the prediction based on historical data or in planning according to forecast trends and for these reasons; they are increasingly used in today's business under the decision support system. The key factor for the implementation of the method is ultimately the knowledge of the user who applies the method in question so that he or she can produce the research data well and, ultimately, interpret it accurately.

The basic self-organising map consists of *m* neurons usually located on a two-dimensional network. A network of neurons (neural space) can be visualised to reflect the spatial properties of the original data (Kohonen et al. 1996). The SOM algorithm is iterative.

Each neuron *i* is associated with a parametre vector called the *i* reference vector

$$m\_i=[\mu\_i1,\mu\_i2,\mu\_i3,\ldots,\mu\_in\ ]\text{^}T\in R\text{^}n. \quad (2)$$

The input vector

$$x = [\xi\_1, \xi\_2, \xi\_3,\ldots, \xi\_n]\ \text{^}\ T\in R\ \text{^}\ n \quad (3)$$

is connected to all neurons in parallel by variable weights μ_ij that are generally different for different neurons.

Euclidean distance ‖x-m_i ‖

$$c = \arg\min\_i \{\|x-m\_i\|\} \text{ is the same as } \|x-m\_c\| = \min\_i \{\|x-m\_i\|\} \quad (4)$$

where *c* is the index of the "nearest" reference vector *x* in the space of the input signals. Each neuron i has a d-dimensional prototype vector, where *d* is the number of variables

$$m\_i = [m\_i1\ m\_i2\ m\_i3\ldots\ m\_id] \quad (5)$$

representing the sample unit in the original dataset.

SOM prototype vectors have been trained to represent the original dataset at a much smaller size and can form a map in which each prototype vector is a unit (neuron) of that map.

In this regard, each training stage is a unit of sample x from the original data set and is selected at random, and then it measures the similarity between the sample and all prototype map vectors.

For the purposes of this paper and the analyses performed, the network was trained with 20 neurons (sizeoftwodimensionalMap).

3. RESULTS AND DISCUSSION

The overall results of the analysis of the selected data from the financial statements are shown in Figure 1 (created by the authors). They indicate a basic blueprint that defines how a business creates value for itself while providing value to the customer.

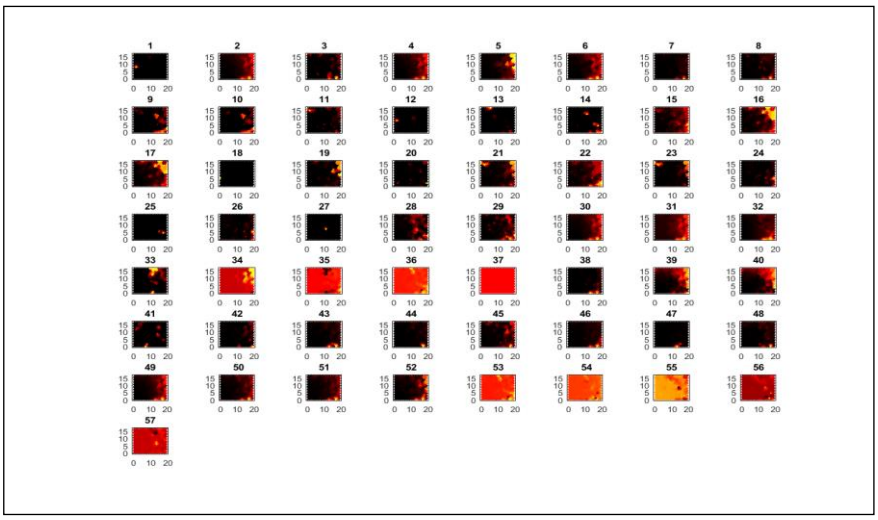

Figure 1. Results of the Analysis of the Selected Data from the Financial Statements

This primarily referrs to the revenue model within the profit formula that can be initially analysed based on the revenue-related cluster shown in Figure 2 (created by the authors).

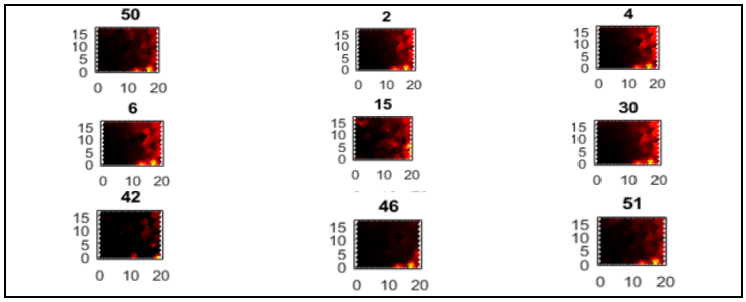

Figure 2. The Relationship Between Revenue and Selected Financial Parametres

Revenue generation (No. 5) in business models of hotel companies based on the analysed sample is related to fixed assets (No. 2), especially tangible assets (No. 4), i.e., buildings (No. 6). In addition, the analyses point to the importance of current assets for

revenue generation (No. 15) as well as the importance of total assets (No. 30), other long-term liabilities (No. 42), liabilities to employees (No. 46), and operating expenses (No. 51).

Therefore, in the business models of Croatian hotels, the cost structure is related to the costs for the acquisition and maintenance of tangible assets (namely, buildings), as well as current assets (receivables and inventories) and employee-related expenses. Also, this analysis clearly identifies that the key resources in the business models of Croatian hotel companies are construction facilities and employees. Key operational processes are therefore related to the management of capital investments and sources of financing, efficient management of current assets and efficient personnel management.

A more detailed analysis of the selected financial indicators (Table 1) served to clarify the profit formula itself. The results of the analysis of the selected financial indicators are presented in Figure 3 (created by the authors).

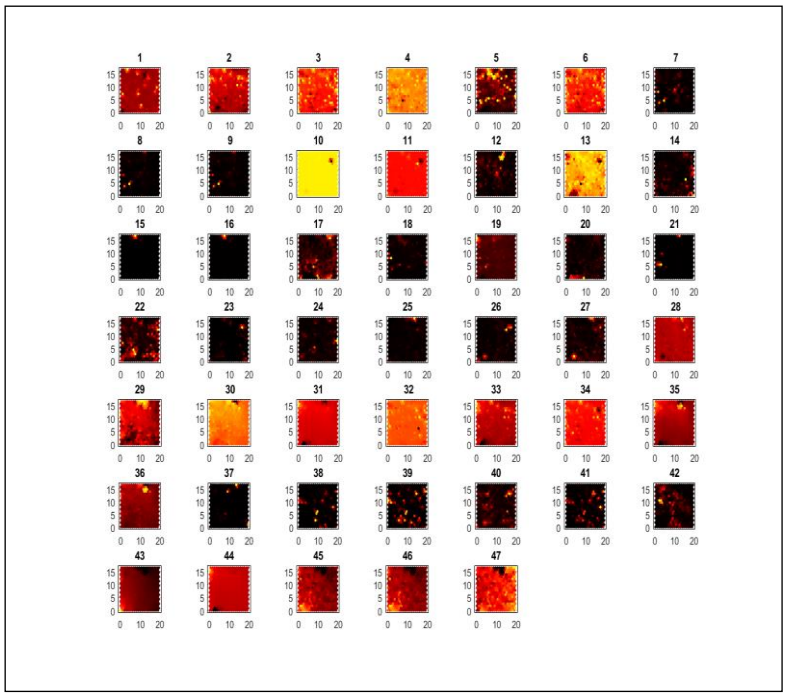

Figure 3. Results of the Analysis of Selected Financial Indicators

This analysis indicates that there are several clusters that can serve to analyse and evaluate the business models of hotel companies. The first one shown in Figure 4 (created by the authors) relates the capex / depreciation indicator to profitability (ex1), days to money conversion, EBITDA margin, net margin, ROA, operating efficiency, net profit or loss per employee, and average monthly net employee earnings.

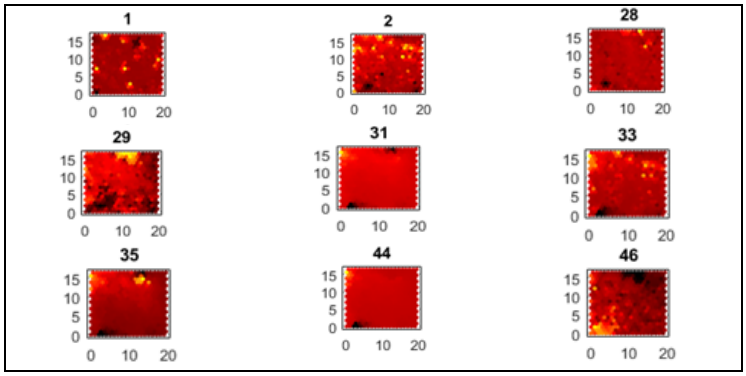

Figure 4. Analysis of the First Cluster of Indicators Relevant to Hotel Business Models

This cluster explains more clearly the structure of the above-mentioned profit formula. Except for tax savings over the useful life of the asset, which is indirectly related to the days of conversion to cash, Capital Expenditures to Depreciation Ratio indicates a business growth phase. A high ratio indicates that a company is investing heavily in its long-term assets, implying the expectation of future growth or expansion. Sales revenue is considered to grow faster at a high ratio of this indicator. This correlation is further confirmed by the ex1 indicator, i.e. the profitability defined in this way.

The EBITDA margin indicates the effective or ineffective cost structure, i.e. the ability to retain much of the revenue after covering expenses. This can be further confirmed by the net profit margin of the business, also classified in this cluster.

ROA within this cluster confirms the rate of return on assets within the profit formula.

Net profit or loss per employee and the average monthly net salary of employees within this cluster confirm the already mentioned importance of personnel management and the importance of employees in the cost structure of hotel companies.

Figure 5 (created by the authors) shows another important cluster in the context of business models of such companies, namely the relationship between value creation and the BEX Index, return on invested capital, and share of personnel costs.

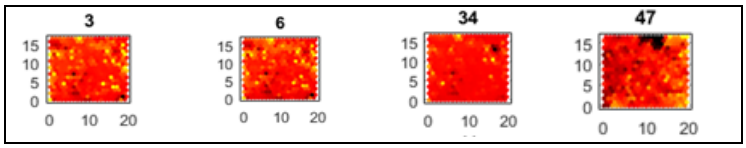

Figure 5. Analysis of the Second Cluster of Indicators Relevant to Hotel Business Models

This cluster connects the already defined key resources of the hotel companies and key processes within them. The BEX Index itself is an indicator of business performance and excellence, and return on invested capital shows how much profit at the EBIT level a company generates from equity invested in a business, and is therefore a valuable

indicator of operational success of asset management. The share of employee costs that measures the share of employee costs in operating income underlines the importance of analysing the movement of these indicators given the success of the two above.

That is why these indicators are important for Croatian hotel companies to evaluate key business model processes and to compare them with competitors' business models.

The third cluster shown in Figure 6 (created by the authors) links liquidity (ex3), EBIT margin, and ROE.

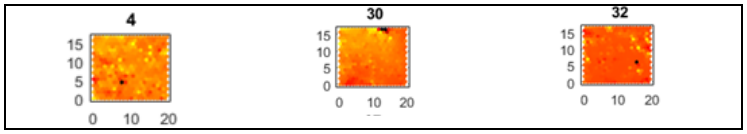

Figure 6. Analysis of the Third Cluster of Indicators Relevant to Hotel Business Models

The correlation of these indicators within the same cluster is important for the definition of the margin model because the EBIT margin shows the percentage of results at the EBIT level that an entity retains per unit (kuna) of operating revenue after settling regular operating expenses / expenses, and relates them to liquidity and ROE.

Financial strength (ex 4), monetary coverage of operating expenses, debt factor and total assets turnover ratio are the characteristics of the linkage within the fourth cluster shown in Figure 7 (created by the authors).

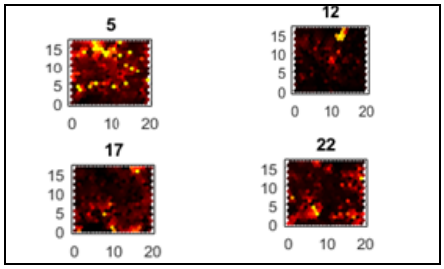

Figure 7. Analysis of the Fourth Cluster of Indicators Relevant to Hotel Business Models

It points to the conclusion that the speed of return on assets within the profit formula of the hotel business model has a great impact on financial strength, monetary coverage of operating expenses, and financing structure (indebtedness factor).

The largest cluster linking: current liquidity ratio, current ratio, financing ratio, coverage of total liabilities from EBITDA, short-term liabilities coverage, current assets turnover ratio, paying days to suppliers, coefficient of investment, asset renewal ratio, the write-off rate of fixed assets, capital expenditures to depreciation ratio, and number of employees is shown in Figure 8 (created by the authors), and it shows what the financing of key resources and key activities of hotel companies in Croatia depends on and how it is structured.

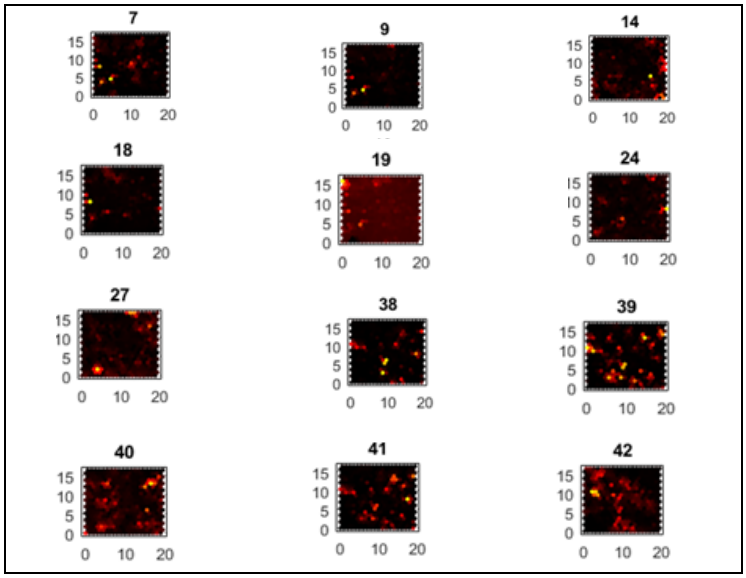

Figure 8. Analysis of the Fifth Cluster of Indicators Relevant to Hotel Business Models

The sixth cluster linking: interest coverage from EBIT, average interest expense, turnover ratio of fixed tangible assets, days of collection of receivables, stock tying days, and cost-effectiveness of financial activities is shown in Figure 9 (created by the authors).

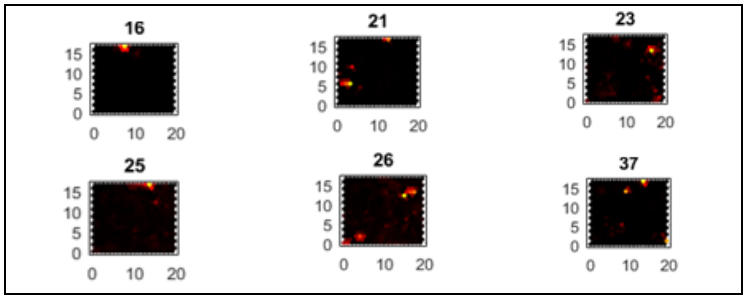

Figure 9. Analysis of the Sixth Cluster of Indicators Relevant to Hotel Business Models

The fourth, fifth and sixth cluster are closely linked and can clearly monitor and analyse the correlation between cost structure, margin models, and rate of return on assets.

Cost effectiveness of business activities, business revenue per employee, and average monthly gross earnings constitute the last, seventh cluster (Figure 10, created by the authors).

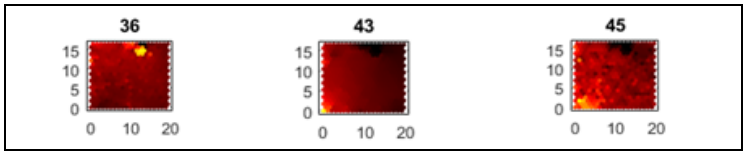

Figure 10. Analysis of the Seventh Cluster of Indicators Relevant to Hotel Business Models

The relationship between operating revenue (sales and other operating revenue) and operating expenses (e.g. material costs, costs of employees, depreciation, etc.) determines the direction of employee-related cost structure as key resources.

CONCLUSION

Business models of Croatian hotel companies can be determined and monitored based on financial information and indicators. Analyses that classify this information into specific clusters, such as the self-organising neural network analysis used in this research, may significantly contribute to it.

Customer value is determined by the amount and movement of operating revenue and this indicator can be used to evaluate this element of business models. In addition, profit trends must be monitored side by side.

The definition of how value is created is determined by the profit formula. Within the profit formula, the construction of the revenue model depends most on the profitability of the business and is strongly linked to the other elements of the profit formula, i.e. cost structure, margin model, and rate of return on assets.

The cost structure, however, is clearly determined by key resources, that is, in the case of these companies, material assets, and employee costs.

The margin model and its effectiveness can be monitored by EBITDA margin, EBIT margin, net margin, net profit or loss per employee, and money conversion days.

Key processes that are characterised by management or operational processes can be tracked by value creation indicators, the BEX Index, return on invested capital, and share of personnel costs.

The limitations in the research conducted in this paper are related to a more detailed analysis of each cluster that determines each part of the business model and modeling of each of its elements, which is also a recommendation for future research.

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