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Ivan Peronja[1], Juraj Bukša[2], Tihomir Luković [3]

PREDICTIVE ANALYTICS IN CONTROLLING AND STRATEGIC RISK MANAGEMENT IN NAUTICAL TOURISM – CASE STUDY OF ACI

Abstract: The current business environment is characterized by rapid technological changes and high external risks affecting businesses and industries, especially in tourism and the nautical sector. Tourism, including nautical tourism, is crucial to Croatia's economy, making strategic risk management essential for long-term success. The development of the Fourth and onset of the Fifth Industrial Revolution bring new business models that rapidly change operations. COVID-19, as a strategic risk, caused significant impacts and triggered new management models in nautical tourism, particularly in marinas linked to the charter sector. The aim of this research is to identify factors influencing strategic decision-making to increase resilience to crises and uncertainties. The research confirms that the impact of crises varies across the Adriatic coast depending on strategic decisions made by marina management and owners, highlighting the importance of adaptability and proactive risk management. These findings are important for improving business strategies to ensure resilience and growth amidst high risks, contributing to a better understanding of the nautical sector's specifics in Croatia.

Keywords: strategic risk management, predictive analytics, controlling, ACI marina system, COVID-19

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[1] University of Split, Faculty of Maritime Studies, Split, Croatia, ORCID ID: 0000-0001-5375-6950, email: iperonja@pfst.hr

[2] University of Rijeka, Faculty of Maritime Studies, Rijeka, Croatia, ORCID ID: 0000-0002-9121-5706, email: juraj.buksa@gmail.com

[3] Aspira University of Applied Sciences, Split, Croatia, ORCID ID: 0000-0001-5043-1579, email: tiholukovic@gmail.com

Introduction

There are various reasons and types of large and powerful crises that increasingly affect entire industries as well as national economies. Due to the high level of long-term risk involved, such crises are referred to as *strategic risks*. Strategic risks have led to the development of *strategic risk management*, which is closely linked with and supported by *controlling*, particularly in addressing, and increasingly, in predicting the emergence, strength, and impact of strategic risks.

Therefore, there is a significant difference between transition economies and developed countries, as their understanding and application of strategic management and controlling vary considerably. In accordance with this difference, strategic risks affecting Croatia as a transition economy are often perceived as "unpredictable", whereas for developed EU economies, especially Germany – they are considered predictable. This disparity explains the major differences in the damage caused by strategic risks in transition economies versus developed ones.

Tourism, and especially nautical tourism, is of particular importance to Croatia. Nautical tourism is highly developed along the Croatian coast and often acts as a local driver of development. It is therefore essential to examine the factors that positively or negatively influence resilience to upcoming strategic risks such as the COVID-19 pandemic. Marinas, in this context, express a strong intention to assume the role of local development leaders, which is why this research will focus on the factors that influence the business performance of marinas (Luković et al., 2024). Given that berth revenues are a key part of income for Croatian marinas, and that ACI is the largest chain of marinas in Croatia, the Mediterranean, and even beyond, the business strategy regarding berth management implemented by ACI's management will be examined. In light of ACI's performance in the pandemic year 2020, this study will analyses the performance of ACI marinas across the entire Croatian Adriatic coast.

The aim of the research is to evaluate the differences in marina performance based on their geographic positioning along the Croatian coast. The research hypothesis states that the location of marinas on the Croatian Adriatic significantly influences business outcomes under strategic risk conditions. Furthermore, as strategic risks are becoming more frequent, the study will also address the importance of *predictive analytics* in forecasting upcoming risks to which management must adapt their business strategy.

To conduct this research, various methods will be used, with particular emphasis on *comparative methods* to evaluate the business results of ACI marinas along the Croatian Adriatic. Accordingly, a suitable methodology will be applied and adapted to explore the business strategy related to berth management in ACI marinas.

Materials and methods

Predictive Analytics and Controlling. The development of business thinking aimed at maximizing business performance has evolved through crisis situations that have prompted new approaches to operations. In this process, the advancement of *e-technology* has played a crucial role by providing tools to support business decision-

making. The *controlling approach* to management, especially that of the European (notably German) school has developed systems for forecasting future events, including crises, which significantly contribute to both strategic management and controlling.

In line with the development of e-technology, *predictive analytics* has emerged within the controlling function (Figure 1).

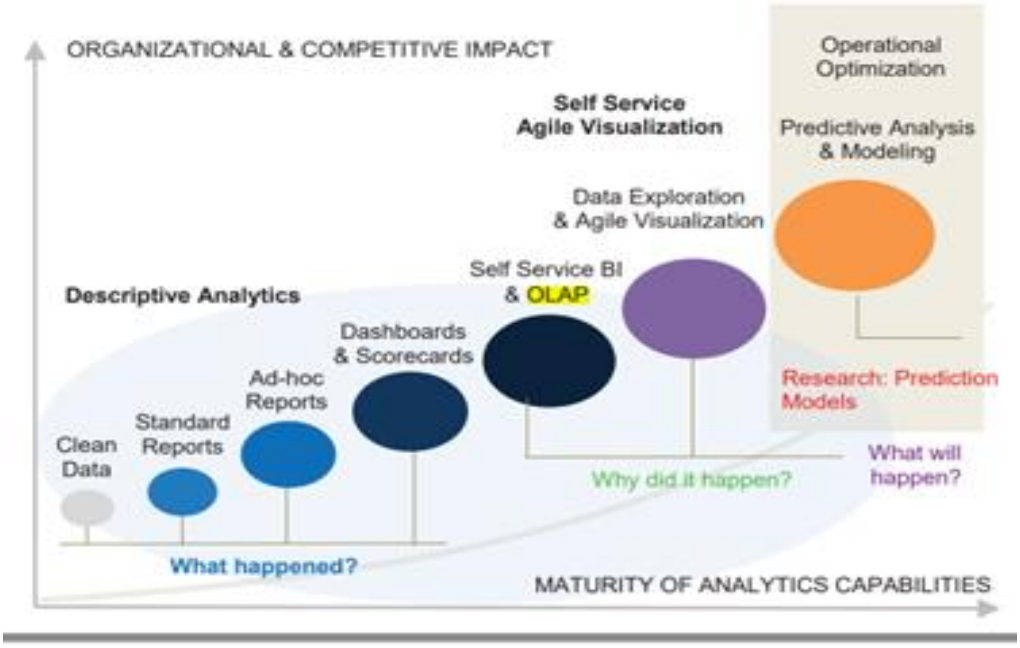

Figure 1. The development of analytics throughout history
Source: Bakhshaliyeva et al., 2017; Lebefromm, 2021

According to the definition: Predictive analytics is the use of data to forecast future trends and events. It utilizes historical data to predict possible scenarios that can assist in making strategic decisions. Predictions can relate to the near future, for example, forecasting a machine failure later that day, or to the more distant future, such as forecasting your company's cash flows for the coming year (Business Insights, 2021). Analytics, as a foundation for insights and subsequently as a basis for decision-making, has evolved in line with both needs and technological advancement. It is important to distinguish between four key types of data analytics (A Beginner's Guide…, 2004):

- Descriptive analytics, which answers the question "What happened?"
- Diagnostic analytics, which answers the question "Why did it happen?"
- Prescriptive analytics, which answers the question "What should we do next?"
- Predictive analytics, which answers the question "What is likely to happen in the future?".

As can be seen, the main difference between classical and predictive analytics lies in their approach to the *time dimension*. Predictive analytics, influenced by controlling, focuses on the future, that is, on forecasting all types of events, especially crisis situations.

In today's business environment, many companies use OLAP (Online Analytical Processing) to gain better insight into their operations and company activities. As noted by Valicon 2021, *business analytics* or *business intelligence* deals with historical data, which is collected and structured in a way that provides a clear overview of the company's

performance. These analyses are based on past events. Past results are reviewed, and future decisions depend on the knowledge and experience of the decision-makers, but this is still not predictive analytics (Valikon, 2021). Predictive analytics is a real process, essentially a forward-looking form of Business Intelligence (BI). Major IT companies are investing vast amounts of money into this field. IBM offers numerous analytics solutions to clients, both for large corporations and small businesses. A leader in this domain, SAP is developing new generations of predictive analytics tools, which are used to conduct research across various industries. Particularly interesting is the research conducted in the area of the Croatian marina industry.

The quantitative research was carried out using the SAP Predictive Analytics (SAP PA) computer application (Lebefromm, 2021). SAP's interest in the Croatian marina industry confirms the high quality of Croatian marinas. The implementation of the SAP Predictive Analytics (SAP PA) application marks an important step in the integration of controlling, which is still in its early stages in Croatia.

The significance of SAP Predictive Analytics (SAP PA) as a component of controlling is particularly important in the context of strategic risk management.

Modelling Predictive Analytics (SAP PA). The modelling of Predictive Analytics (SAP PA) and its application to the Croatian marina industry was conducted by Lebefromm. In explaining the design of the theoretical Predictive Analytics (SAP PA) model, Lebefromm states that the model was developed using quantitative research, which was carried out through a computer application named SAP Predictive Analytics (SAP PA). The model used the Support Vector Machine (SVM) algorithm developed by KXEN.

As the foundation of the SAP PA model, forecasting models were established, with parameters set in a way that would generate the highest quality prediction results. As Lebefromm explains, parameterization involved the selection of a target variable, while excluding irrelevant variables that could distort the results. This was done through the successive evaluation of key performance indicators KI and KR, which are used to calculate the quality of the predictive model.

The accuracy of the SAP Predictive Analytics model, set in this way, highlights the influence of explanatory variables on the target variable. The effectiveness of predictive models can be measured using two key performance indicators.

It is necessary to explain What are these key indicators, KI and KR. The abbreviations KI and KR come from the American company KXEN INC., which was founded in 1998. So, KI is an abbreviation for "KXEN Information Contribution", KR is an abbreviation for "KXEN Robustness". As stated by Lebefromm (2021):

a) Predictive Power (KI) or *predictive capability* indicates the accuracy of the model. KI ranges from 0.0 to almost 1.0, typically around 0.998. The higher the KI value, the more significant the explanatory variables are. However, not all available explanatory variables from the database should be used. Only the relevant variables that contribute to the target variable should be considered. These are the variables with the strongest correlation to the target variable.
b) Forecast Reliability (KR) or *prediction reliability* characterizes the statistical robustness of the model. KR ranges from 0.0 to 1.0. Only a value above 0.95 indicates

that the model is robust. A model is considered robust when it can be expected to deliver the same prediction quality using new data with unknown outcomes.

It should be noted that in this study, Lebefromm (2021) focuses on the market and the configuration of the SAP PA model with regard to marina revenues. The results of the SAP Predictive Analytics (SAP PA) prediction model, as configured, were visually presented in the form of a model chart.

The performance indicators KI and KR are explained using the numerical example in the Figure 2.

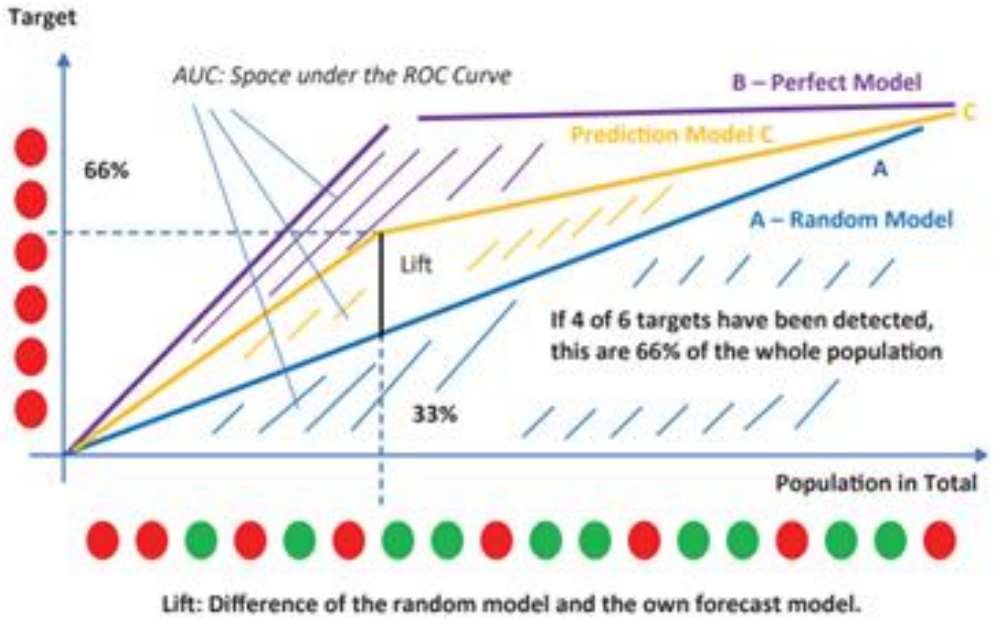

Figure 2. Prediction Model and the Perfect Model
Source: Lebefromm, 2021

A forecasting model includes parameters that help identify target customers – that is, those who are most likely to be interested in the company's products. From a business standpoint, such models enable faster identification of potential customers, thereby reducing marketing costs. At the same time, revenues can be increased through more efficient targeting enabled by predictive models. KI (Predictive Power) is calculated as follows:

Revenues can be increased by using forecast models. KI is calculated as follows:

$$\text{Predictive Power: } KI = C/(A + B + C)$$

The areas A + B + C shown in the previous figure represent the population. The ratio of the area of the forecasting model C and the perfect model B to the population A + B + C is the measure of the predictive accuracy of the model and thus the result of model training (estimation). The ratio of the area of the forecasting model C to the population A + B + C is a measure for the verification of the forecasting accuracy of the model (validation). As part of the validation process, it is intended to examine, regarding to the known statistical results, whether the predictions calculated by the model on the known statistical results

can be confirmed. The robustness of the forecast model, is the applicability to statistical data whose result is not known, takes place via the calculation of KR. KR results as:

$$\text{Prediction Confidence (KR)} \approx 1 - B/(A + B + C)$$

The areas are calculated mathematically using the determined integral. The computer application uses the so-called rectangle methods as an approximation. For this purpose, the area of the function is divided into large number of rectangles whose areas are summed up. It results in a sum of rectangles, which are above the function and a sum of rectangles that lie below the function. The mean value is formed from both values. The curve therefore is named ROC curve (Receiver Operating Characteristics) (Krzanowski & Hand, 2009).

This represents a compelling demonstration of the forecasting capabilities that can be developed through specialized tools such as Predictive Analytics (SAP PA), particularly for the purpose of anticipating upcoming strategic risks affecting the marina industry. Such an algorithmic application is essential for the activation of strategic risk management, which is becoming increasingly necessary for the Croatian marina industry, an industry on which the sustainability of the coastal economy heavily depends.

Strategic risk management. Strategic risks refer to threats, either internal or external in origin, that are of such magnitude that they may jeopardize the very survival of an enterprise.

In the simplest terms, by definition, strategic risks are those risks a company assumes which have the potential to result in substantial loss (Rost, 2020). These are therefore high-impact, high-intensity threats. In terms of classification, strategic risks can be external or internal, and both categories encompass a range of critical threats that demand attention and response from management. These are not merely risks to the company's future success, they pose a threat to its continued existence (Table 1).

Table 1. Types of Internal and External Strategic Risks

Internal Strategic Risks	External Strategic Risks
Change risk: Disruption due to changes within the company, most often due to management changes.	**Regulatory risk:** Challenges of compliance and legal rules, which most often damage the economies of EU transition countries.
Reputation risk: Damage to the brand image due to bad business or something else.	**Competitor risk:** The threat from rival organizations comes as competing companies develop faster than our company.
Governance risk: Problems in organizational management, most often with bad top management.	**Economic risk:** Sensitivity to economic fluctuations, which occurs due to numerous reasons, especially due to external threats.
Financial risk: Exposure to financial uncertainties generally comes as a result of other problems, not by itself.	**Political risk:** The influence of political factors especially affects transitioning EU member states that do not have a stable national policy and macro-strategic system.
Operational risk: Hazard in everyday business, as a result of the incompetence of employees at all levels, especially management.	

Source: authors elaboration

In accordance with the aforementioned risks, it is necessary to activate strategic risk management, which must be directed toward the type of risk that threatens the company's operations and survival. Strategic risk management is, above all, tasked with supporting managers in the achievement of business objectives, which makes it closely connected to controlling. In times of an approaching crisis, or when internal issues emerge that could escalate into a crisis, strategic risk management takes on full importance.

Surveys conducted on large samples show that supporting the achievement of company goals is the second most important role of strategic risk management (KPMG, 2025). In practice, however, the situation is somewhat different, as the majority of attention directed toward risks tends to focus on preventive activities such as control and monitoring of risk development. In reality, particularly in the case of Croatian marinas, controlling and oversight mechanisms that should support strategic risk management are often lacking or insufficient. This raises the key research question: Do large marina systems, such as ACI, effectively manage challenges during times of crisis?

Results and discussion – ACI in Strategic Business Decisions

The ACI chain of Croatian Marinas. The largest marina chain in the Mediterranean and Europe is the Croatian company ACI (Adriatic Croatia International Club), organized as a joint-stock company specializing in marina operations. Today, ACI operates 22 marinas along the Croatian Adriatic coast, from north to south, making it the leading marina organization in Croatia, headquartered in Rijeka. In relation to all Croatian marinas, ACI accounts for 39% of the marinas and 35% of total berths along the Croatian Adriatic. As a joint-stock company, the majority owner of ACI is the Government of the Republic of Croatia. According to its business strategy, ACI hosts around 3,500 vessels under annual contracts and logs approximately 115,000 boat-days in transit. During the peak season, over 400,000 nautical tourists visit ACI marinas, and 27 charter companies operate within the ACI system, offering a fleet of more than 400 charter vessels (Luković & Piplica, 2021; Peronja et al., 2025).

ACI, setting a long-term business strategy. There are two fundamental long-term business strategies for marinas on the Croatian Adriatic. The first is focused on daily/transit berthing, while the second is centered on annual berth contracts. A combination of these two strategies is also possible, although in practice, marina owners and management typically choose one primary approach. Accordingly, for the 22 ACI marinas, the owners and management have opted for a strategy based on transit berthing. As a result, long-term (annual) berth contracts are strategically deprioritized, while daily/transit berths are favoured. The rationale behind this strategic choice lies in the significantly higher revenue and profit potential associated with transit berths (Table 2).

As can be seen from the analysis and recalculation of prices for daily berths, the profitability of daily berthing compared to annual contracts is approximately 1:6. However, if we take into account that marina operations last a little over 6 months, allowing for a correction coefficient of 0.5, the result is still a significant 1:3 advantage in favour of daily berth operations compared to annual vessel berthing contracts.

Table 2. Average Berth Prices in 2023 for ACI marinas in Opatija and Pomer, by Time Criteria (in EUR)

Marina	Annual	Monthly	Daily	Converted into daily berth and daily berth profitability index				
				Annual	Index	Monthly	Index	Daily
Opatija	6.210	1.346	76	17,0	447,1	44,9	169,3	76
Pomer	5.986	1.064	98	16,4	597,6	34,5	284,1	98

Source: ACI marina Opatija; ACI marina Pomer

This ratio is entirely reasonable under non-crisis conditions. The question arises: what happens to the operations of ACI marinas in times of crisis, particularly during crises of strategic proportions? To make the calculation more realistic, we used artificial intelligence, which gave the following answer:

Daily berth profitability index

- Example (ACI Marina Opatija, fictitious data):
  - Annual berth price: € 6 000
  - Transit daily berth: € 90
- Calculation:
  - Daily berth from annual price: 6000/365≈€ 16.44
  - Profitability index: 9016.44≈5.47
- Conclusion: Daily berth brings about 5.5 times more income per day than annual.

Strategic decisions of ACI in times of crisis. The crisis that struck the global, European, and Croatian economies in 2020, the COVID-19 pandemic, also affected Croatian marinas and the charter industry. Although the crisis and its potential impact could have been anticipated, the Croatian economy, including marinas and charters, was unprepared. As a result, numerous problems became evident within both the macroeconomic system of Croatia and the micro-level systems of marinas and charters.

What is most important to highlight is that charter businesses had no ability to counter the effects of the COVID-19 crisis through their business strategies, whereas marinas did have such a possibility. Specifically, it became clear that under the influence of the pandemic, guest arrivals and the use of Croatian rental vessels (charters) more than halved in 2020. As stated: "At the beginning of the pandemic COVID-19, all reservations for the preseason were cancelled, and cancellations for July and August began to follow. Up until June, not a single charter company received a new reservation inquiry. The total number of charter guests dropped by 65%, with 112,810 charter guests visiting us in the first seven months of this year, compared to 317,700 in the same period last year" (Klisović, 2020). However, what became evident in 2020 was the uneven decline in charter activity depending on the charter base location along the Croatian Adriatic coast. In the northern marinas, such as those in Istria, for example, Marina Punat or Marina Veruda, the decline in charter business was around 54%. At the same time, in the southern marinas, such as Dubrovnik or Marina Agana, charter companies experienced a drop as

high as 85%. Charter companies in central Dalmatia (Šibenik and Zadar) achieved 45% of their 2019 turnover (Klisović, 2020).

The differences in charter performance during the pandemic year of 2020 were also reflected in the operations of Croatian marinas, though not entirely uniformly. Some marinas suffered minimal losses, while ACI experienced significant losses.

To address the question of how ACI marinas perform under strategic crisis conditions, such as the COVID-19 pandemic, a case study approach will be used, focusing on two ACI marinas in Istria, two in Central Dalmatia, and finally, two in the southern part of the Croatian coast.

As shown in the Table 3, ACI marinas Umag and Cres recorded a revenue decrease of 6–13% in 2020 compared to the previous year, 2019. Operating costs were clearly reduced during the same period, resulting in a positive profit margin of 2–6%. This indicates that the marinas of the Northern Adriatic managed to independently and successfully withstand the impact of the COVID-19 pandemic, continuing to operate under a daily berthing business strategy.

Table 3. ACI Marina Umag and Marina Cres in Istria, Northern Adriatic

Indicators	2019.	2020.	2023.	Rate of change 2020/2019	Index 2023/2019
Marina Umag					
Total Revenue (in €)	1.425.896	1.229.906	1.669.892	86,3	117,1
Revenue from Berths (in €)	1.145.006	1.000.883	1.331.531	87,4	116,3
Profit Before Tax (in €)	275.785	293.125	629.530	106,3	228,3
Fixed Concession Fee (in €)	12.572	12.572	12.572	100,0	100,o
Variable Concession Fee (in €)	35.647	30.734	41.747	86,2	117,1
Number of Employees	16	15	14	93,8	87,5
Total Berths	575	555	555	-3,5%	96,5
Sea Berths	535	515	515	-3,7%	96,3
Land Berths	40	40	40	0,0%	100,0
Concession Area (m^2)	135.315	135.315	135.315	0,0%	100,0
Marina Cres					
Total Revenue (in €)	1.834.261	1.725.091	2.302.218	-6,0	125,5
Revenue from Berths (in €)	1.539.798	1.447.746	1.906.307	-6,0	123,8
Profit Before Tax (in €)	455.908	456.610	712.512	0,2	156,3
Fixed Concession Fee (in €)	12.629	12.629	12.629	0,0	100,0
Variable Concession Fee (in €)	45.857	43.113	80.235	-6,0	175,0
Number of Employees	20	19	17	-5,0	85,0
Total Berths	531	510	510	96,0	96,0
Sea Berths	461	440	440	95,4	95,4
Land Berths	70	70	70	100,0	100,0
Concession Area (m^2)	135.929	135.929	135.929	100,0	100,0

Source: ACI Analysis Department (3/31/2024)

As shown in the Table 4, the marinas of the Central Adriatic, Marina Šimuni and Marina Vodice – experienced a revenue decline of 3–17% in 2020 compared to the previous year, 2019. Revenue from berths decreased by 4–8%, resulting in a 30% drop in profit at Marina Vodice, while Marina Šimuni, notably, achieved a 12% increase in profit. This was clearly the result of a significant reduction in operating costs. These results indicate that Central Adriatic marinas were affected differently by the impact of the COVID-19 pandemic, despite both following a daily berthing business strategy.

Table 4. ACI Marina Šimuni and Marina Vodice in Central Dalmatia

Indicators	2019.	2020.	2023.	Rate of change 2020/2019	Index 2023/2019
Marina Šimuni					
Total Revenue (in €)	707.793	686.232	878.679	-3,0	124,1
Revenue from Berths (in €)	601.424	579.742	732.793	-3,6	121,8
Profit Before Tax (in €)	188.664	211.284	263.509	12,0	139,7
Fixed Concession Fee (in €)	3.269	3.269	3.269	0,0	100,0
Variable Concession Fee (in €)	17.696	17.156	21.967	-3,1	124,1
Number of Employees	11	11	15	0,0	136,4
Total Berths	236	236	246	0,0	104,2
Sea Berths	191	191	191	0,0	100,0
Land Berths	45	45	55	0,0	122,2
Concession Area (m^2)	35.189	35.189	35.189	0,0	100,0
Marina Vodice					
Total Revenue (in €)	1.902.354	1.581.712	2.017.161	-16,9	106,0
Revenue from Berths (in €)	1.426.992	1.311.544	1.640.372	-8,1	115,0
Profit Before Tax (in €)	960.556	667.773	835.028	-30,5	86,9
Fixed Concession Fee (in €)	6.786	6.786	6.786	0	100,0
Variable Concession Fee (in €)	47.559	39.535	69.981	-16,9	147,1
Number of Employees	17	20	22	17,6	129,4
Vezovi ukupno	432	432	437	100,0	101,2
Vezovi u moru	382	382	412	100,0	107,9
Vezovi na kopnu	50	50	25	100,0	50,0
Površina pod koncesijom (m^2)	73.045	73.045	73.045	100,0	100,0

Source: ACI Analysis Department (3/31/2024)

As shown in the Table 5, the Southern Adriatic marinas, Marina Korčula and Marina Dubrovnik, were severely impacted by the strategic risk of COVID-19, recording a significant revenue drop in 2020 ranging from 25% to 39%. At the same time, the remote southern region of the Croatian Adriatic proved too risky for nautical tourists, resulting in berth revenue reaching only 59–76% of the previous year's figures. This led to a substantial decline in pre-tax profit, ranging from 36% to as much as 308%.

Table 5. ACI Marina Korčula and Marina Dubrovnik in Southern Dalmatia

Indicators	2019.	2020.	2023.	Rate of change 2020/2019	Index 2023/2019
Marina Korčula					
Total Revenue (in €)	1.093.015	671.120	1.386.835	-38,6	126,9
Revenue from Berths (in €)	940.988	555.245	1.203.085	-41,0	127,9
Profit Before Tax (in €)	78.292	-162.675	38.695	-307,8	49,4
Fixed Concession Fee (in €)	2.794	2.794	2.794	0,0	100,0
Variable Concession Fee (in €)	26.261	16.009	33.599	-39,0	127,9
Number of Employees	12	12	15	0,0	125,0
Vezovi ukupno	178	178	182	0,0	102,2
Vezovi u moru	162	162	166	0,0	102,5
Vezovi na kopnu	16	16	16	0,0	100,0
Površina pod koncesijom (m^2)	30.070	30.070	30.070	0,0	100,0
Marina Dubrovnik					
Total Revenue (in €)	3.965.571	2.980.546	3.775.529	-24,8	95,2
Revenue from Berths (in €)	3.154.376	2.403.907	2.851.780	-23,8	90,4
Profit Before Tax (in €)	2.101.655	1.355.300	1.105.760	-35,5	52,6
Fixed Concession Fee (in €)	11.512	11.512	11.512	0,0	100,0
Variable Concession Fee (in €)	98.569	74.507	131.849	-24,4	133,8
Number of Employees	25	25	28	0,0	112,0
Vezovi ukupno	490	490	491	0,0	100,2
Vezovi u moru	370	370	371	0,0	100,3
Vezovi na kopnu	120	120	120	0,0	100,0
Površina pod koncesijom (m^2)	123.905	123.905	123.905	0,0	100,0

Source: ACI Analysis Department (3/31/2024)

From the analysis of the business performance of marinas in Istria, the Central Adriatic, and the Southern Adriatic, we can conclude that the daily berth (transit berth) business strategy yielded positive results in the Northern Adriatic, with profits rising up to 6% compared to the successful year of 2019. This suggests that Northern Adriatic marinas, by continuing to follow a daily berth strategy, managed to successfully withstand the strategic risk posed by COVID-19. Clearly, proximity to Croatia's key outbound markets had a positive impact on business outcomes.

In contrast, marinas in the Central Adriatic experienced more pronounced revenue losses, and profits began to decline. Their success depended on cost-cutting measures and management effectiveness in avoiding negative financial results.

Marinas in the Southern Adriatic were unable to withstand the strong influence of the strategic risk brought by COVID-19, which in 2020 halted revenue and profit growth. They experienced a revenue decline of 25–39%, while profit fell drastically, by 308% in the case of Marina Korčula compared to 2019.

When viewed in the context of recovery from the strategic risk of COVID-19 that hit the ACI marina system in 2020, results vary. Northern Adriatic marinas continued to

deliver positive revenue and profit results in 2023. Meanwhile, Central Adriatic marinas were still in recovery, with performance differing from marina to marina. ACI marinas in the southern region had not yet fully recovered in 2023, revenue was gradually improving, but profits remained negative.

According to the analysis of total revenue and berth revenue within the ACI marina system in 2020, significant differences in revenue and profit were observed across marinas from north to south along the Croatian Adriatic coast. Therefore, it can be concluded that a marina's geographic position along the Adriatic significantly influences the sensitivity of its operations during strategic risks such as the COVID-19 pandemic in 2020.

ACI's strategic decisions outside the scope of strategic risk management. The decision by the ACI chain of marinas to focus all their Adriatic operations, from north to south, on transit berths brought ACI to the brink of profitable performance in 2020. At the same time, some private marinas recorded only negligible losses, which can be attributed to differing business strategies regarding berth management. To better understand the contrast between these two berth strategies, a practical comparison is necessary.

For this purpose, Marina Frapa Rogoznica was selected. In 2020, it operated 586 berths, while ACI had 5,865 berths. One might expect that ACI would perform ten times better than Marina Frapa Rogoznica in 2020. However, the opposite was true. From its inception, Marina Frapa Rogoznica has consistently followed a strategy based on annual berth contracts, whereas ACI has remained committed to transit berth operations.

The daily (transit) berth strategy, with little attention to contracted berths, exposed the vulnerability of Adriatic marinas during a severe crisis. Furthermore, ACI's marina system lacked any strategic risk management, and the transit berth strategy proved highly sensitive to crisis conditions.

In the clash of the two strategies, the annual berth contract model showed clear superiority. As a result, Marina Frapa's profit in 2020 fell by only 1.5% compared to 2019, whereas ACI saw a dramatic drop in profit of 98.7% compared to the previous year. In absolute terms, ACI achieved only €510,000 in profit in 2020, while Marina Frapa Rogoznica reported a profit of €12.772 million (original data from Marina Frapa and ACI for 2019 and 2020).

ACI's strategic decisions in conjunction with strategic risk management. In short, when viewed through the lens of strategic risk, ACI's decision regarding berth operations should be developed selectively, in accordance with each marina's geographical location along the Adriatic coast and with full consideration of emerging strategic risks. Accordingly, it is necessary to develop a strategic risk management framework that would suggest the dynamics of changing berth management strategies, all in line with the set strategic objectives.

As a foundation for strategic management within the ACI system, the following baseline positions must be adopted:

a) Marinas in the northern Adriatic have valid reasons to continue with the transit berth strategy. Meanwhile, contracted (annual) berths can be maintained at their current levels. Any

losses resulting from threats such as COVID-19 can be offset by profits from risk-free business years.

b) Marinas in the central Adriatic need to conduct calculations and studies to determine the required number of annual berth contracts that would ensure positive results during a crisis. Based on this, the number and proportion of berths allocated for transit business would be defined.
c) Marinas in the southern Adriatic must focus heavily on annual berth contracts to shield themselves from significant losses during crisis periods. Transit berth operations should only apply to those berths that remain unfilled through annual contracts.

Conclusion

The study of the ACI marina system's results, which consistently applies a transit berth strategy, revealed all the key characteristics of such a model.

It is undisputed that, at least theoretically, revenue from transit berths can be more profitable than from annual berth contracts. However, the transit berth model assumes operations in a risk-free environment, without the influence of strategic risks. Given that risk-free business conditions are increasingly rare, and that strategic shocks are expected to become more frequent, marina business strategies, especially those of ACI marinas spread across the Croatian Adriatic – must be adjusted accordingly.

The research conducted in this paper showed that northern Adriatic marinas proved relatively resilient to the strategic risk shock of COVID-19 in 2020. Their financial results that year were not significantly worse than in 2019, and they continued to perform successfully in the following years. This can be attributed to their proximity to key emitting markets such as Italy, Germany, and Austria, as well as strict measures to contain the pandemic. In fact, many sailors considered being at sea the best form of protection from COVID-19, while also enjoying the pleasures of a summer holiday.

Marinas in the central Adriatic (Dalmatia) recorded negative business results in 2020 while operating under the transit berth strategy. However, these results recovered and turned positive in the following years, with 2023 figures surpassing those from 2019. For ACI marinas in this region, a long-term success analysis should be conducted, comparing and contrasting the transit berth strategy with annual berth contract models.

Marinas in the southern Adriatic demonstrated a high level of vulnerability to threats like COVID-19. The significant losses of 2020 persisted through 2023, showing no signs of recovery. This raises a serious question for ACI management and stakeholders about the continuation of the transit berth strategy, something which, by all indications, lacks objective justification.

In conclusion, the application of a uniform transit berth strategy across all ACI marinas is not justified and, in fact, proves harmful. This means that the ACI marina system's management must conduct comprehensive analyses and replace the one-size-fits-all transit strategy with a selective approach tailored to the specific strategic risks of each location. In doing so, predictive analytics and controlling must play a key role in management decision-making, and their results and recommendations must be

acknowledged. Without frequent and high-quality research, as well as strong predictive analytics and controlling functions, the business risks of ACI marinas are not acceptable.

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