DYNAMIC PANEL ANALYSIS OF THE DETERMINANTS OF HOTEL BUSINESS SUCCESS

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The study examines the impact of macroeconomic and microeconomic factors on hotel performance, measured by return on equity (ROE), in the Republic of Serbia. A dynamic panel data model was applied to a sample of 94 hotels. Macroeconomic indicators include GDP growth, inflation, political risk, infrastructure quality, and financial market development, while microeconomic factors cover service quality, management quality, employee pro-social behavior, guest satisfaction, and guest loyalty. The findings highlight the critical role of management quality in driving hotel performance. Conversely, high structural capital efficiency, unfavorable financial market conditions, and poor past performance negatively affect success. This research contributes to the hospitality literature by integrating macro- and micro-level determinants within a dynamic framework, offering insights for both policymakers and hotel managers on how external conditions and internal practices jointly shape financial outcomes. The main limitation of the study is its inability to test all variables simultaneously within a single model due to issues with the positive-definiteness of the matrix.

Keywords: Hotel industry; Microeconomic and macroeconomic factors; Panel data analysis; Serbia.

INTRODUCTION

According to WTTC (2024), tourism contributed USD 10.9 trillion to global GDP, or 10% of the total, and supported about 357 million jobs worldwide, roughly 1 in every 10 (Aksoy et al., 2022). These data clearly underscore the importance of tourism. Martinez-Martinez, Cegarra-Navarro, Garcia-Perez, and Wensley (2019) and Pimić, Simonović, Radivojević, Nicolae, and Ćurčić (2024) state that hospitality, along with food service, is the sector experiencing the most rapid growth within tourism. However, in contemporary global tourism, the hotel industry faces numerous challenges that can significantly impact its operations. Confronted with increasing competition, changing consumer demands, and economic fluctuations, hotels must understand which determinants play a key role in achieving business success. In this context, hotel business success can be defined as the ability to achieve strategic goals, enhance competitiveness, and increase guest satisfaction, all of which ultimately affect profitability (Josimović et al., 2025).

There are relatively few studies that investigate the simultaneous influence of both macroeconomic and microeconomic factors on the success of hotel operations. It is particularly important to note that there are almost no studies that have concurrently explored these factors using dynamic panel data analysis models. Dynamic panel analysis stands out as one of the most powerful tools for analyzing economic and managerial phenomena, as it allows for the examination of changes in data over time while considering various individual characteristics of the entities (Radivojević & Jovovic, 2017). This method enables researchers to observe how the

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determinants of hotel business success evolve over time, providing a deeper understanding of the dynamics within the sector. By analyzing panel data, researchers can identify key variables that impact hotel performance, including the influence of profitability from previous periods on current outcomes. Studying both macroeconomic and microeconomic factors simultaneously is rare in the hospitality industry. Similar research is more common in other sectors of the tertiary industry, such as banking. Therefore, it is important to investigate the key success factors in hotel operations using panel analysis that considers both types of factors. This is especially important in the case of the Republic of Serbia, because no similar research has been conducted. Hence, the aim of this paper is to examine the influence of key macroeconomic factors, such as the stability of the political environment, the competitiveness of the tourist destination, and the development of the financial market, as well as microeconomic factors, including service quality, management quality, pro-social behavior of employees, and guest satisfaction and loyalty, with a note that political environment is treated in a broader sense, which is in line with Marić (2024).

The first part of the paper is introductory. The second part presents previous research in this area. The third part is dedicated to the research methodology and data sources. In the fourth part, the obtained findings are presented and analyzed. The final part contains concluding remarks, in which the limitations of the research are discussed.

LITERATURE REVIEW

Research on hotel service quality and its impact on guest satisfaction and loyalty, particularly within the SERVQUAL model, can be grouped into two categories. The first includes studies examining all dimensions simultaneously (Hallencreutz & Parmler, 2021; Kalnaovakul & Promsivapallop, 2023; Monteiro, 2021; Padma & Ahn, 2020; Pimić et al., 2023; Savaş, 2020), while the second focuses on specific dimensions (Koch et al., 2020; Patrick et al., 2019). However, Kuzu (2024) highlights significant shortcomings in the application of SERVQUAL, cautioning against its uncritical use. These critiques underscore the need for more rigorous methodological approaches to capture the complex interrelationships between service quality, customer satisfaction, and loyalty in the hotel sector.

In addition to service quality, as previously discussed, microeconomic factors such as the quality of management and employees are often the subject of interest in numerous studies (Deng & Ritchie, 2018; Hossain et al., 2021; Huang & Liu, 2024; Jung et al., 2024) have provided insights into these factors. Management quality is shaped by entrepreneurial orientation, leadership style, and commitment to sustainable practices, while employee quality is reflected in pro-social behavior and job satisfaction, particularly among front-line employees whose interactions with guests critically influence satisfaction and loyalty (Koch et al., 2020; Radivojević et al., 2025). Together, these factors highlight the importance of effective leadership and engaged employees as key drivers of competitiveness and long-term success in the hospitality sector. However, an in-depth examination of the impact of management and employee attitudes and behaviors in hospitality as microeconomic factors of business success can only be achieved through quantitative research.

The quality, or more precisely the (in)stability of the political environment, has been studied by numerous authors, including Causevic and Lynch (2013), Tang and Lau (2020), Chiang, Zlateva and Ivanov (2020) and Khan et al. (2022). These studies generally support the expectation that a stable political environment positively influences the development of tourism and the success of hotel businesses, while instability has a negative impact. Typically, in these studies, the (in)stability of the political environment is expressed through traditional proxies. However, using such indicators does not account for all aspects of the quality of the political environment, which necessitates the use of additional indicators, including political risk and the quality of institutional infrastructure. More details on the reasons for using these additional indicators can be found in Papović, Radivojević and Dević (2020).

Authors such as Filipović, Makuljević and Radivojević (2024) have examined the quality and competitiveness of tourist destinations as macroeconomic factors influencing success in the hospitality industry. The study reveals that the competitiveness of a tourist destination is determined by human resources, infrastructure development, and the richness of natural resources, which is in accordance with the models of competitiveness of a tourist destination proposed by Filipović (2023). Competitiveness is typically expressed through the Travel and Tourism

Competitiveness Index, justified by the fact that it is a composite index integrating pillars that reflect the quality of the competitive factors of the destination. However, considering that hotels with their amenities and attractions are a factor influencing the competitiveness of the tourist destination, the use of this index in this manner leads to issues of endogeneity. This means that the conclusions of all studies that did not rely on dynamic panel data estimators must be accepted with a certain degree of caution. To ensure more accurate and reliable results, it may be necessary to apply methodologies that account for the interdependent relationships between hotels and their surrounding tourism environments, potentially incorporating dynamic panel methods that can better capture these interactions over time.

The influence of financial market development as a determinant of hotel business success has been the subject of study in research by Altin, Kizildag and Bufquin (2018). The results of this research indicate that the development of the financial market plays an important role in hotel operations, primarily due to the seasonal nature and price elasticity of tourist demand. A well-developed financial market can provide hotels with better access to financing options, enabling them to invest in improvements, marketing, and overall operational efficiency. Furthermore, it can help hotels manage cash flow fluctuations associated with the seasonal trends in tourism demand, thereby enhancing their ability to adapt to changing market conditions and ultimately contributing to their success (Petrović & Lazarević, 2023). These findings underscore the importance of considering the financial context when evaluating the factors that drive hotel performance.

A systematic review of the extant literature unequivocally reveals that prior investigations are constrained by notable methodological limitations, which must be duly acknowledged when assessing the validity of their findings. Furthermore, these studies have predominantly adopted a reductionist perspective by isolating individual factors, thereby disregarding their reciprocal interplay. Equally important, they have overlooked the inherently dynamic nature of these influences. Hence, it becomes imperative to undertake a more comprehensive inquiry in which such factors are examined concurrently, with explicit consideration of their evolving impact on hotel business performance, while simultaneously addressing the methodological deficiencies inherent in earlier research.

Thus conceived, the research design has the potential to provide an answer to the following research question: To what extent do the simultaneous and dynamic interactions among macroeconomics and microeconomics factors influence hotel business performance, and how can the methodological limitations identified in previous studies be effectively addressed?

RESEARCH METHODOLOGY

Data and sample

To address the stated research question, an empirical investigation was conducted on a sample of 94 hotels operating in the Republic of Serbia. Given that one of the factors being examined is the competitiveness of the tourist destination, the sample primarily consists of hotels (approximately 75%) located in tourist areas of the Republic of Serbia, including Vrnjačka Banja, Soko Banja, Zlatibor, Kopaonik, Tara, Stara Planina, and Aranđelovac. However, to include business tourists in the sample, hotels from larger cities such as Belgrade and Novi Sad were also incorporated into the study. The sample includes hotels with three stars (43 hotels), four stars (34 hotels), and five stars (17 hotels), of which 10 are located in Belgrade and 1 in Novi Sad. This diverse selection of hotels across different categories and locations aims to provide a comprehensive analysis of the factors influencing hotel business success in Serbia.

Data were collected for the period from 2015 to 2020. Primary data related to microeconomic factors were gathered through questionnaires, while data regarding macroeconomic variables were obtained from the official websites of the World Bank and the World Travel and Tourism Council. More specifically, primary data concerning success factors in hotel business, such as service quality, guest satisfaction, and loyalty resulting from the provided service or service recovery, were collected using the SERVQUAL questionnaire. Primary data related to microeconomic factors concerning success factors associated with management quality and pro-social behavior of employees were collected based on questionnaires from hotel operation databases, specifically using Fidler's questionnaire. Data regarding hotel business success were obtained from the official website of the Business Registers Agency for the observed period.

The significance of the age structure of respondents, in terms of their belonging to specific tourist generations, has led to a particular emphasis on ensuring that the sample equally represents members of the millennial generation (bleisure guests), iGen, and the baby boomer generation. A detailed breakdown of the hotel guests who participated in the research is provided in Table 1.

Table 1: Structure of hotel guests - respondents

Descriptions	Hotel category		
	3*	4*	5*
Under 25	113	32	11
25 to 45	152	88	48
Over 45	68	25	63
Males	180	74	101
Females	153	71	21
University education	109	69	89
Average length of stay in hotel	5.8	4.2	3.8

The sample size, among other factors, is determined by the fact that a valid application of panel data requires that the number of observations must be greater than the number of variables in the model. By applying an appropriate panel data estimator, the issue arising from the relatively short observation period combined with a large number of observation units can be adequately addressed. This comprehensive approach to data collection allows for a robust analysis of both microeconomic and macroeconomic factors influencing hotel performance, thereby providing valuable insights into the dynamics of the hospitality sector in Serbia.

Dynamic panel data analysis model

A dynamic panel data analysis model was utilized to simultaneously examine macroeconomic and microeconomic factors influencing hotel business success in the Republic of Serbia. Within the scope of macroeconomic factors, the study investigated the impact of the political environment, the competitiveness of the tourist destination, and the development of the financial market. On the microeconomic side, the analysis focused on the effects of hotel service quality, management quality, pro-social behavior of frontline employees, guest satisfaction and guest loyalty.

Considering the aforementioned aspects related to the identification of specific success factors for hotel operations, the selection of variables, or the appropriate proxies for key macro and microeconomic factors, was guided by three main considerations: 1) The variables must be identified in the literature as valid surrogates for the key success factors in hotel business and should be instrument able in cases of endogeneity; 2) Data for these variables should be available, at least over a certain period covering the study, enabling any missing data to be simulated using bootstrap resampling techniques; 3) There should be conflicting opinions in the literature regarding the sign of their influence; and 4) These factors had not been studied within dynamic panel analysis models before. Hotel business success in the model is represented by the return on equity (ROE).

The (in)stability of the political environment will be represented through indicators of macroeconomic stability, such as the growth rate of gross domestic product (GDP) and the inflation rate, as well as through a political risk index, which serves as a good indicator of the quality of (in)stability of the political environment and institutional infrastructure in a broader sense. The selection of these indicators is largely in line with Papović et al. (2020). The GDP growth rate represents the annual growth rate of all goods and services produced within a national economy over the course of a calendar year. A higher GDP growth rate is expected to serve as a good indicator of a favorable political environment and a higher quality of institutional infrastructure, contributing to hotel business success. The inflation rate is also a significant indicator of macroeconomic stability; however, in this context, a higher rate indicates more challenging business conditions and is anticipated to have a negative correlation with hotel business success. The political risk index represents a composite indicator of the overall country risk, incorporating various indicators of political stability and quality, ranging from political upheavals to economic openness (Papović et al., 2020). It is expected that a higher value of this indicator will be positively correlated with hotel business success, as it implies a stable political environment and quality institutional infrastructure.

Starting interpretation of the definition of a tourist destination by Filipovic et al. (2024), that the existence of specific infrastructure is crucial for generating tourist demand and consumption at a destination, the competitiveness of the tourist destination is expressed through the infrastructure quality indicator. Although there is an indicator that more precisely represents this factor (Travel and Tourism Competitiveness Index), this indicator was

not used in the model due to potential endogeneity issues; instead, the quality of infrastructure indicator was utilized. This indicator represents a composite measure that integrates the quality of various types of infrastructure. It was developed by the World Economic Forum.

The development of the financial market is indicated through broad money indices. Namely, as a consequence of the existence of a bank-centric system in which banks offer loans to hotels on very unfavorable terms with a limited range of financing instruments (Veselinović & Makojević, 2016), on the one hand, and the seasonal nature of hotel business on the other, the development of the financial market in terms of the existence of alternative sources of financing for hotel operations is an important factor in business success. The greater the development of financial markets, the wider the range of options available to hotels for addressing short-term liquidity constraints and securing investment capital on more favorable terms. As broad money reflects the amount of money in circulation, the growth rate of broad money indices seems to be an adequate proxy for market development. Moreover, Marić and Ignjatijević (2023) shown that there is a connection between this factor and the development of the financial market. Specifically, the growth rate of broad money represents an indicator for measuring the amount of money circulating in a national economy, which includes not only cash but also other assets that can easily be converted into cash. The assumption is that as the growth rate of broad money increases, it means that hotels have greater access to larger amounts of money, which, according to the law of supply and demand, will result in lower prices (interest rates), positively reflecting on their operations.

The quality of hotel service is expressed as the difference between the total scores of perceived and expected service qualities. Data were collected using the SERVQUAL questionnaire, the validity of which was tested through exploratory factor analysis (EFA). The validity of the questionnaire was tested on a sample size of 600 respondents. For testing sample adequacy and the degree of correlation between the questionnaire items, the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy (KMO = 0.776) and Bartlett's test of sphericity ($\chi^2(861) = 18263.78$, with p-value = 0.000) were utilized. The results of both tests indicate that the sample is adequate. Considering that, when studying economic and social phenomena with factor analysis, it is customary to apply oblique rotation, a Promax rotation was used for the purposes of this paper. This type of rotation allows factors to be correlated with each other. In the context of developing an extended SERVQUAL questionnaire, the application of Promax rotation means that it is accepted that all items in the questionnaire measure the same attitude of hotel guests. The results of the EFA analysis showed that the items were grouped according to expectations. All factor loadings were above 0.5, and there were no inter-factor loadings above 0.3. Therefore, all items were retained when calculating total scores.

Despite the view that hotel management quality should be considered in the context of three dimensions, for the purposes of this work, it is represented in the category of Fidler's minimum preferred coworker coefficient, which reflects the sum of scores given by hotel employees to evaluate their supervisors based on 18 bipolar (positive or negative) adjectives. Each of these adjectives was rated on a scale from 1 to 8.

Pro-social behavior of frontline employees expressed as a percentage of incentives relative to the hotel's total revenue. Despite being aware that this indicator has at least two significant drawbacks: 1) employees may be rewarded for various reasons, not solely due to praise received from guests, and 2) prosocial behavior, by its definition, is not recognized by formal reward systems, thereby making it ineligible for incentivization, this proxy is still used in the paper, because numerous studies show significant discrepancies between employees' attitudes regarding their pro-social behavior and the actual pro-social behavior they exhibit. For this reason, measuring the level of their pro-social behavior through performance metrics would not be valid.

The efficiency coefficient of structural capital contains the market-valued knowledge and abilities of employees; therefore, along with the previously described proxy, this indicator is also used in the paper as a representation of pro-social behavior. For the purposes of the paper, this coefficient is calculated using the VAIC model to measure the efficiency of intellectual capital: $VAIC = HCE + SCE + CEE$, where are HEC- human capital efficiency, SCE - structural capital efficiency and CEE- capital efficiency.

As previously stated, the mathematical model can be presented as follows:

$$ROE_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 GDP_t + \beta_3 INF_t + \beta_4 IPR_t + \beta_5 III_t + \beta_6 BMR_t + \beta_7 LPC_{i,t} + \beta_8 PSP_{i,t} + \beta_9 SCE_{i,t} + \beta_{10} QS_{i,t} + \beta_{11} SAT_{i,t} + \beta_{12} LOY_{i,t} + u_{i,t} \quad (1)$$

where are:

- $ROE_{i,t}$ - return on equity of the i-th hotel in the current period,
- $ROE_{i,t-1}$ - return on equity of the i-th hotel from the previous period,
- GDP_t - growth rate of gross domestic product,
- INF_t - inflation rate,
- IPR_t - political risk index,
- III_t - infrastructure quality indicator,
- BMR_t - growth rate of broad money,
- $LPC_{i,t}$ - least desirable employee,
- $PSP_{i,t}$ - percentage of incentive in relation to total hotel revenue,
- $SCE_{i,t}$ - efficiency coefficient of structural capital,
- $QS_{i,t}$ - quality of hotel service,
- $SAT_{i,t}$ - hotel guest satisfaction,
- $LOY_{i,t}$ - hotel guest loyalty,
- $u_{i,t}$ - random model error.

Considering the possible endogeneity problem due to the inclusion of $ROE_{i,t-1}$ in the model, the GMM estimator was chosen to estimate the model parameters. In addition, GMM is particularly suitable for dynamic panel data settings as it effectively addresses unobserved heterogeneity, measurement errors, and simultaneity bias, while ensuring consistent and efficient estimates even in the presence of endogenous regressors. This methodological choice therefore strengthens the robustness of the results and enhances the reliability of the conclusions drawn from the analysis. Since the application of this estimator means that the first-order differentiation technique is applied to the base model, the model in its final form looks like:

$$\Delta ROE_{i,t} = \alpha + \beta_1 \Delta ROE_{i,t-1} + \beta_2 \Delta GDP_t + \beta_3 \Delta INF_t + \beta_4 \Delta IPR_t + \beta_5 \Delta III_t + \beta_6 \Delta BMR_t + \beta_7 \Delta LPC_{i,t} + \beta_8 \Delta PSP_{i,t} + \beta_9 \Delta SCE_{i,t} + \beta_{10} \Delta QS_{i,t} + \beta_{11} \Delta SAT_{i,t} + \beta_{12} \Delta LOY_{i,t} + \Delta u_{i,t} \quad (2)$$

The problem of potential endogeneity in the model is addressed by using all values of $ROE_{i,t-k}$) for $k > 1$as instruments for $\Delta ROE_{i,t-1}$. The unobserved effect $ROE_{i,t-k}$is replaced with zero. In GMM estimator terminology, this means using the relation: $\mathrm{E}(\Delta u_{i,t}, ROE_{i,t-k}) = 0$ for every $k > 1$as as a condition of orthogonality. The covariance matrix is calculated using an iterative method, starting from the assumption that the covariance matrix (W) is equal to the identity matrix (I), such that in the (h+1)-th iteration $W = J_h^{-1}$, assuming that $\hat{\theta}_h$ is obtained in the h-th iteration, where is

$$J_h = \frac{1}{n} \sum g_i(\hat{\theta}_h)\, g_i'(\hat{\theta}_h) \quad (3)$$

The justification for applying this so-called one-step GMM estimator can be found in the works of Radivojević, Cvijanović, Sekulić, Pavlović, Jović and Maksimović (2019), which emphasize that although the two-step GMM generates better estimates, due to its high computational, cost, and time demands, preference should be given to the one-step GMM.

RESULTS OF THE ANALYSIS

Table 2 presents the results of the descriptive statistical analysis of the variables used in model (2).

The results of the analysis show that the average value of ROE is negative, indicating that hotels, on average, incurred negative business results during the observed period. The high value of the standard deviation of about 30% suggests a significant discrepancy in business success among the hotels. This is expected considering the sample of hotels. The values of the kurtosis and skewness coefficients indicate a greater likelihood of achieving negative business results compared to positive ones. This can be interpreted as a higher number of hotels in the

sample having experienced negative business outcomes. The analysis of the LPC variable indicates that employees are generally very satisfied with their management, meaning that hotel managers are more oriented toward employees than tasks. However, the high standard deviation for this variable suggests that in some hotels, employees are dissatisfied with their management, meaning that managers are more task-oriented than employee-oriented. Considering the mean value (4.00) and the maximum (6.9) and minimum (0.1) values of this variable, it can be clearly concluded that quality management, which is attentive to employee needs, predominates in the hotels. Their expected behavior and attitude towards guests is likely to reflect this, suggesting that this will be a significant factor in the business success of hotels in the Republic of Serbia. The average value of the PSP variable, around 0.2%, clearly indicates that hotels allocate more than modest resources to reward pro-social behavior among hotel employees. The small difference between the average value and the minimum and maximum indicates that hotels in the Republic of Serbia behave similarly regarding this factor. The minimum value of PSP at 0.0% indicates that some hotels do not even reward their employees based on this criterion. Given this data, it is expected that this variable will not have a significant impact as a factor of hotel business success, as theory and empirical research conducted in developed countries imply. The very low average value of the efficiency coefficient of intellectual capital, coupled with a very high standard deviation, clearly indicates a differing approach that hotels in the Republic of Serbia have regarding the importance of intellectual capital as a factor of business success. Including the coefficients of kurtosis and skewness further amplifies this negative effect.

Table 2: Descriptive statistics of selected variables

	ROE	**LPC**	**PSP**	**SCE**	**QS**	**GDP**
Mean	-0.004	4.000	0.002	0.585	0.431	0.021
Standard deviation	0.313	1.178	0.002	2.680	0.838	0.020
Kurtosis	54.457	0.177	9.587	224.368	0.374	-0.379
Skewness	-6.151	-0.438	2.938	12.624	0.527	-1.044
Minimum value	-3.404	0.100	0.000	-10.606	-2.045	-0.016
Maximum value	0.525	6.902	0.015	48.679	2.955	0.040
Number of observations	470	470	470	470	470	470
	PRI	**INF**	**BMR**	**III**	**LOY**	**SAT**
Mean	0.434	0.019	0.086	3.700	4.287	4.397
Standard deviation	0.100	0.007	0.036	0.261	0.807	0.761
Kurtosis	-1.182	-0.544	-0.740	-1.402	2.248	3.281
Skewness	0.676	0.818	0.318	0.407	-1.392	-1.651
Minimum value	0.340	0.011	0.036	3.400	1.000	1.000
Maximum value	0.600	0.031	0.145	4.100	5.000	5.000
Number of observations	470	470	470	470	470	470

As for the quality of hotel service, the results of descriptive statistics indicate that guests' expectations regarding the quality of hotel service are generally met. The similarities regarding the delivered quality among hotels reflect the difference between the minimum and maximum values of this variable. However, caution should be exercised when interpreting these results, considering the studies previously mentioned in the dissertation, which indicate that hotel guests attribute different significance to various dimensions of service quality depending on the category of the hotel. The guests' attitude toward expected and perceived service varies depending on the category to which the hotel belongs. Since the sample consists of hotels from three different categories, this should be considered when interpreting the assessment of parameters and the statistical significance of this factor. Furthermore, it should be noted that the results of the analysis related to satisfaction and loyalty show that the values of these variables range from minimum (1.00) to maximum (5.00), indicating that there are both highly satisfied and highly dissatisfied guests. The standard deviation of about 80% supports this observation. Compared to findings from other studies conducted in developed countries, the findings from this dissertation are more than expected. However, the high average values of these factors indicate that, in general, guests are satisfied with the quality of service provided by hotels in the Republic of Serbia. Similar values for these variables may also indicate

that the respondents were loyal guests. Since they are simultaneously satisfied, future research should take this into account. In other words, for a more valid analysis, it may be better to include only first-time guests at a hotel, or to survey them before and after their stay.

The results of the descriptive statistics concerning macroeconomic factors affecting hotel business success indicate that the macroeconomic conditions are not particularly favorable for operations. This conclusion is drawn in light of the macroeconomic business conditions presented in other studies previously mentioned. The GDP growth rate of approximately 2% during the observed period suggests economic growth, albeit a modest one. The average value of the Political Risk Index, at 0.4, indicates a slightly elevated risk. This indicator ranges from a maximum of 1, which implies a positive environment, to a minimum value of 0.0, indicating a highly risky and unstable political environment. Moreover, the average inflation rate of 1.9% denotes that there were no significant price fluctuations during this period, reflecting a relatively stable macroeconomic environment. Conversely, the low rate of broad money suggests unfavorable conditions for acquiring additional capital for financing, primarily affecting current liquidity. Finally, the Infrastructure Quality Index value of 3.70 indicates that the Republic of Serbia does not have particularly high-quality infrastructure.

Since a valid application of panel data analysis requires that there is no multicollinearity among the variables, this section of the dissertation includes an analysis of the correlation matrix among the selected variables. The correlation matrix is presented in Table 3.

As can be seen, there is no significant correlation among the selected variables. Therefore, it can be confidently stated that there is no risk of multicollinearity. For this reason, no variable was excluded from further analysis. Considering that the first step in estimating parameters of the dynamic model for panel data analysis involves testing for stationarity, this section of the dissertation presents the results of the ADF test for the stationarity of the series. The results are shown in Table 4, noting that the optimal lag length was determined using the Bretl kernel.

Table 3: Correlation Matrix

	ROE	LPC	PSP	SCE	QS	GDP	PRI	INF	BMR	III	LOY	SAT
ROE	1.00											
LPC	0.06	1.00										
PSP	0.03	-0.01	1.00									
SCE	-0.10	-0.03	0.03	1.00								
QS	0.07	0.01	-0.03	0.04	1.00							
GDP	0.02	0.10	-0.03	0.00	0.01	1.00						
PRI	0.04	0.25	-0.01	0.01	-0.04	0.73	1.00					
INF	-0.07	0.05	0.01	0.00	0.11	0.30	0.01	1.00				
BMR	0.00	0.19	0.02	0.09	-0.06	0.06	0.35	-0.49	1.00			
III	0.03	-0.23	0.00	-0.04	-0.04	-0.79	-0.72	-0.60	-0.20	1.00		
LOY	-0.04	0.00	0.09	-0.02	-0.11	0.00	0.00	0.16	0.06	-0.14	1.00	
SAT	0.00	0.05	0.11	-0.09	-0.18	0.12	0.19	0.24	-0.05	-0.25	0.54	1.00

Table 4: ADF test

Variables		ADF test	Variables		ADF test
ROE	basic level	0.000	**LOY**	basic level	0.000
LPC	basic level	0.000	**SAT**	basic level	0.000
PSP	basic level	0.000	**QS**	basic level	0.000
SCE	basic level	0.000			
GDP	basic level	0.606	**BMR**	basic level	0.271
	1. differentiation	0.000		1. differentiation	0.000
PRI	basic level	0.935	**III**	basic level	0.711
	1. differentiation	0.000		1. differentiation	0.000
INF	basic level	0.394			
	1. differentiation	0.000			

As can be seen in Table 4, all microeconomic variables showed the property of stationarity, while all macroeconomic variables were non-stationary. For this reason, differentiation of macro-economic variables was performed, which after applying first-order differentiation all became stationary.

The results of the parameter estimation of the dynamic model (2) of the panel data analysis are shown in Table 5. More precisely, for the purposes of the analysis, several variants of the model (c) were tested, since the model in its original form could not satisfy all the conditions of validity of the application of the GMM estimator. Therefore, Table VV shows the variants of the model that met all the conditions of valid application of the one-stage GMM estimator. As can be seen from Table VV. The p-value of the first-order autoregression coefficient is less than 0.1, which indicates the existence of first-order autocorrelation, i.e. the p-value of the second-order autoregression coefficient is greater than 0.05, which indicates the absence of serial autocorrelation. Also, the value of the Sargan test shows that the model is oversized, i.e. that all instruments are valid. The dependent variable from the previous period is statistically significant and its value is less than 1, which is one of the conditions for the valid application of the GMM estimator. The Wald test of the joint significance of the regressors also indicates that the model is well specified.

Table 5: Results of model parameter estimation (2)

	Coefficients	St. Error	z - test	p-value	
ROE_{t-1}	−0.039	0.021	−1.848	0.065	**
const	0.001	0.016	0.082	0.977	
LPC	0.108	0.063	1.699	0.089	*
PSP	3.967	5.652	0.701	0.482	
SCE	−0.012	0.005	−2.216	0.027	**
d_GDP	−1.043	0.645	−1.617	0.105	
d_BMR	−0.376	0.222	−1.690	0.091	*
Number of instruments: 12					
Test AR(1): z = -1.82 (0.067)					
Test AR(2): z = -0.185 (0.851)					
Sargan Chi-square(5) = 2.65 (0.752)					
Wald test Chi-square(9) = 16.637 (0.011)					

Note: P-values are given in parentheses. Due to lack of data, i.e. the inability to positively define the matrix, it was not possible to test all selected variables in the same model.

DISCUSSION

The fact that all validity tests of the GMM estimator, presented at the bottom of Table 5, confirm the validity of the model, provides unequivocal evidence that macroeconomic and microeconomic factors must be studied simultaneously. They directly address the stated research question that the simultaneous and dynamic interactions among macroeconomic and microeconomic factors influence hotel business performance. The findings of the study offer important insights into the complex relationships between these factors in the hotel sector. This argument is further reinforced by the statistical significance of different factors. At the same time, the statistical significance of various factors contributes both to confirming and to challenging certain assumptions regarding the direction and importance of their influence, which were derived from previous research and theoretical frameworks. More precisely, the results of the model parameter estimation indicate the following:

1. There is a positive and statistically significant correlation between the LPC variable and the business success of hotels, represented by the ROE variable. The regression coefficient for this variable is 0.108, which means that an increase of approximately 0.11% in this factor leads to about a 1% improvement in hotel business success. Results from previous empirical studies generally indicate that staff prefer a consultative management style (Filipović, 2023). However, research findings on management style and effectiveness in the hotel industry vary (Deery & Jago, 2001). Gilbert and Guerrier (1997) suggest that hotel management style has become more professional, and managers in the hospitality industry now adopt a consultative, team-based leadership approach, recognizing the need for business and strategic skills. Hinkin and Tracey (1999) found that the concept of "idealized influence" or charisma, which "encourages a two-way exchange of views," is of little or no relevance. However, regardless of leadership

style, studies emphasize the importance of cooperation and mutual respect between leaders and employees. This contributes to employee satisfaction and positively affects their performance in a random setting (Mulki et al., 2012). Laškarin Ažić (2017) highlights the significance of satisfaction with management relations and coworker relations and their combined influence on overall job satisfaction and hospitality. Our finding is consistent with recent international studies emphasizing the role of participative and consultative leadership in enhancing organizational performance in hospitality (Kim & Brymer, 2011), reinforcing the global trend that effective management practices grounded in cooperation and respect remain critical determinants of hotel success.

2. There is a negative and statistically significant correlation between the business success from the previous period and the business success of hotels in the current period. The regression coefficient for this factor of hotel performance is -0.039, which can be interpreted as every deterioration of 0.04% in the previous period leading to an improvement in performance in the subsequent period by 1%. The understanding that business success from the previous period significantly influences the business success of hotels in the current period (Dimitrić et al., 2018; 2019) impacted the examination of the impact of selected factors on hotel business success to be carried out using a dynamic panel data model. As a rule, the findings show that the success of business from the previous period has a positive impact on the success of business in the current period (Dimitrić et al., 2018, 2019; Pimić et al., 2024; Skuflić & Mlinarić, 2015). Such findings can be explained by the fact that successful business in the previous period contributed to building a positive hotel reputation, loyalty, and word of mouth through writing a commentary on social networks (Pimić et al., 2024). Another possible reason is that successful business increases the confidence of investors, so hotels can obtain funds on more favorable terms. One explanation for the finding in the paper that is contrary to the dominant view is that hotels which had lower performance in the past may be more motivated or focused on corrections and improvements in the next period, which, on the other hand, causes an inverse relationship between past and present results. In other words, poorer performance in the past can prompt measures to improve current performance, leading to better outcomes in the future. While most international evidence suggests performance persistence across periods (Assaf & Josiassen, 2016), our results highlight the possibility of a corrective mechanism, aligning with findings from turnaround management literature (Pearce & Robbins, 2008), where poor past outcomes stimulate managerial focus and operational improvements.
3. There is a negative and significant correlation between the efficiency of the hotel's structural capital and the business success of hotels. The regression coefficient associated with this factor of hotel performance is -0.012, indicating that any erosion of structural capital results in an improvement in hotel business. Given that a large number of hotels have undergone ownership and other transformations, this value of the coefficient can be justified by two facts: a) old patterns of operations and business processes, which were dominant before the privatization process, have been retained; b) new procedures and organizational methods have not yet yielded the desired results due to the short time frame. One of the reasons may also lie in the inefficient use of this capital, so every investment in it incurs greater costs than benefits. Similar trends have been noted in other business sectors in transition economies. A good example is research related to agricultural companies from Western Balkan countries (Ivanović et al., 2021). Similar results were presented by Al-Musalli and Ku Ismail (2014), and Javed and Jahan (2017), who studied the impact of intellectual capital in the finance sector. The negative association between structural capital efficiency and hotel performance resonates with findings from transition economies, where legacy organizational practices often hinder innovation (Mention, 2012). This suggests that intellectual capital investments may not yield immediate benefits unless accompanied by organizational transformation.
4. There is a negative and significant correlation between the growth rate of broad money and the business success of hotels. The coefficient value for this factor of hotel performance is -0.376, implying that every increase in the growth rate of broad money leads to a deterioration in hotel business success by 1%. This finding is somewhat surprising, particularly for the public, as it is expected that with an increase in broad money, i.e., with more money in circulation, its price (interest rate) would be lower, which should positively reflect on hotel business. This

expectation is based on the results of earlier empirical studies. Namely, empirical results show that hotels exhibited a higher mean return during expansive monetary periods (Chen, 2007). Barrows and Naka (1994) found that a growth rate of money supply had a significantly positive impact on the hospitality returns. Chen and Kim (2006) showed that growth rates of money supply served as a significant predictor of tourism returns. Weerathunga et al., (2020) point out that growth in interest rates caused by restrictive monetary policy has a significantly negative effect on the performance of financial hotels. However, in a broader context, this can be interpreted with the view that an increase in the amount of money in circulation may lead to improved lending conditions for hotels, but not in terms of pricing conditions, rather in other aspects. This result primarily indicates the underdevelopment of the financial market in the Republic of Serbia, as well as its irregularities concerning the functioning of what is known as Smith's invisible hand, the market mechanism. Contrary to earlier international evidence linking monetary expansion to improved hospitality returns (Chen & Kim, 2006; Barrows & Naka, 1994), our results reflect the specific institutional and financial market conditions of Serbia. This divergence underscores the importance of contextualizing monetary effects within the maturity of national financial systems, as highlighted in comparative studies of emerging markets (Sharma & Mitra, 2019).

The other factors are not statistically significant. By situating these findings within recent international literature, the study not only confirms global patterns in leadership and monetary influences but also reveals context-specific deviations that enrich the understanding of hotel performance in transition economies.

CONCLUSION

The study of factors influencing hotel business success in the Republic of Serbia reveals the complex dynamics that shape operations within this sector. Analysis of data from 94 hotels, encompassing both microeconomic and macroeconomic aspects, demonstrates that hotel performance depends on multiple, interrelated determinants requiring careful management and continuous strategic adaptation. The findings highlight the importance of human resources, modernization of organizational practices, and the financial environment as critical elements for competitiveness and long-term sustainability. Overall, these insights imply that the survival and growth of hotels in Serbia will depend on prudent management of relevant factors, supported by policies that enable adaptive responses to the challenges of the modern market.

Like any research of this nature, this study has certain limitations that must be considered when interpreting the results. The first pertains to the selection and operationalization of variables, including the criteria used for choosing factors and the challenges of defining and measuring them. The second limitation concerns the inability to include all relevant factors in the model due to matrix constraints, which raises questions about proper factor definition and selection. Future research should therefore systematically explore alternative proxies and extended lag structures to further validate the robustness and generalizability of our findings. The use of thirty proxies is driven by the problem of validity.

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DINAMIČKA PANEL ANALIZA DETERMINANTI USPEHA POSLOVANJA HOTELA

Studija ispituje uticaj makroekonomskih i mikroekonomskih faktora na performanse hotela, merene prinosom na kapital (ROE), u Republici Srbiji. Dinamički model panel podataka primenjen je na uzorak od 94 hotela. Makroekonomski indikatori uključuju rast BDP-a, inflaciju, politički rizik, kvalitet infrastrukture i razvoj finansijskog tržišta, dok mikroekonomski faktori obuhvataju kvalitet usluge, kvalitet menadžmenta, prosocijalno ponašanje zaposlenih, zadovoljstvo gostiju i lojalnost gostiju. Rezultati ističu ključnu ulogu kvaliteta menadžmenta u podsticanju performansi hotela. Nasuprot tome, visoka vrednost koeficijenta strukturnog kapitala, nepovoljni uslovi na finansijskom tržištu i slabe performanse iz prethodnog perioda negativno utiču na uspeh poslovanja u tekućem periodu. Ovo istraživanje doprinosi literaturi o ugostiteljstvu integrišući makro i mikro nivo determinanti unutar dinamičkog okvira, nudeći uvid i kreatorima politike i menadžerima hotela o tome kako spoljni uslovi i interne prakse zajedno oblikuju finansijske ishode. Glavno ograničenje studije je njena nemogućnost da istovremeno testira sve promenljive unutar jednog modela zbog problema sa pozitivnom definisanošću matrice.

Ključne reči: Hotelijerstvo; Mikroekonomski i makroekonomski faktori poslovanja; Panel analiza; Srbija.