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WHAT DETERMINES THE FINANCIAL STABILITY OF HOTEL FIRMS IN CROATIA?

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ABSTRACT

Investigation of firm financial stability has gained attention of researchers over the last few decades. The fact that the focus of such research was mainly on financial institutions, particularly banks and insurance companies, does not diminish the importance of investigating financial stability of hotel firms, especially in countries where tourism contributes significantly to GDP growth. Thus, the authors have conducted the research in order to estimate the factors that determine financial soundness of medium-sized and large hotel firms that operated in Croatia in the 2020 – 2024 period. The research employed dynamic panel analysis with the aim of estimating impact of various firm-oriented factors consisting of liquidity, leverage, overall business efficiency, earning per employee, firm size, and firm age. Besides that, given that the time frame of the analysis also includes years in which hotel operations were significantly affected by the COVID crisis, the authors took this fact into account by introducing the COVID dummy variable. The results of the analysis reveal that leverage and firm age are significant factors that negatively affect financial stability of hotel firms in a small, tourism-dependent economy. The originality of this paper stems from its orientation on the financial stability of hotel firms in a small, tourism-dependent economy providing empirical evidence on the firm-specific determinants of financial stability using a dynamic panel model positioning it as one of the first comprehensive analyses of financial stability in the Croatian hotel sector.

Keywords: *Croatia, financial stability, determinants, hotel firms*

1. INTRODUCTION

Financial stability is an essential prerequisite for the long-term sustainability and growth of enterprises across all sectors, including the tourism and hospitality industry. Although prior literature has mostly focused on financial institutions such as banks (e.g. Čihák, Hesse, 2010; Fiordelisi, Mare, 2014; Berger *et al*., 2017) and insurance companies (e.g. Altuntas, Rauch, 2017; Shim, 2017; Cummins *et al*., 2017; Puławska, 2021), the same cannot be said for the financial stability of hotel firms, despite the fact that they contribute significantly to economic growth,

employment, and regional development in tourism-oriented economies. According to the Zagreb Stock Exchange, the tourism sector in the Republic of Croatia represents one of the most important branches of the economy with the share in gross national product amounting to almost 25% (www.zse.hr). Therefore, hotel firms are thought to be one of the pillars of economic stability. Their financial sustainability directly affects broader economic resilience, especially during periods of crisis such as the COVID-19 pandemic, geopolitical shocks or seasonal variability in demand.

Financial stability is generally defined as the firms' ability to maintain solvency, withstand the unexpected adverse events, and continue operations without interruption. This is especially true for countries like Croatia, where hotels are mostly small and medium-sized firms, but many belong to larger corporate groups whose operations contribute significantly to market competitiveness and employment. In spite of strategic importance of tourism sector, empirical research analysing the determinants of financial stability of hotel firms remains rare, especially in a small frontier economy like Croatia. Existing research primarily examine profitability or financial performance in general such as papers by Škuflić *et al*. (2013), Škuflić, Mlinarić (2015), Dimitrić *et al*. (2019) and Karanović *et al*. (2020), operational efficiency such as paper by Poldrugovac *et al*. (2016), while financial soundness and its specific factors are often overlooked.

Given the importance that financial stability has on the overall resilience of hotel firms, it is essential to, firstly, understand the factors that influence it. Although limited, the prior literature on hotel firms' financial stability examined various determinants, ranging from strategic diversification to capital structure practices and corporate culture. These studies have added to this emerging field. For example, the primary aim of the study by Lee and Jang (2007) is to examine differences in stability and financial performance of diversified and non-diversified hotel firms listed on US stock exchanges. The authors estimate financial performance using accounting-based measures, market-based measures, and risk-adjusted performance such as growth and instability of ROA, ROE, and net profit margin. The findings indicate that diversification does not lead to profit growth, but it contributes to improved stability. Such results support the existence of a trade-off between stability and financial performance in the context of corporate diversification indicating that market diversification strategies do not serve as an effective tool to enhance financial performance in hotel firms. Furthermore, in order to evaluate the financial condition of service sector enterprises, Drobyazko *et al*. (2020) employ a self-organizing Kohonen neural network map proposing an economic-mathematical model that calculates an integral indicator of financial stability, identifying control charts for key financial coefficients affecting stability assessments. These control charts were analysed to detect special causes of variability in financial stability processes. Nguyen *et al*. (2023) conduct a global investigation encompassing 30 countries on the role of capital structure management in sustaining resilience capacities and financial performance of hotel firms during Covid-19 pandemic. They primarily find that lower debt capital structure diminishes the negative impact of the pandemic on hotel firms' financial stability, which is more evident for smaller, slow growing hotel firms that are diversified to a lesser extent. Similarly, Ashraf *et al*. (2025)

investigate the influence of COVID-19 pandemic on capital structure of five tourism and hospitality industries considering different ownership structures and firm sizes. Using a large dataset comprising 94,588 firms from 31 European countries in the 2012-2021 period, they find an increase of debt level among observed firms during the pandemic. Furthermore, the authors find that this positive impact is more evident in publicly owned and smaller firms. Crespí-Cladera *et al*. (2021) explore the importance of the financial strength of firms in hospitality industry in Spain to explain differences in resilience to the COVID-19 pandemic and any other crisis. Specifically, the authors analyse the firms' survival chances in different scenarios of revenue drop. Their findings indicate cash holdings and a strong financial structure to have a key role in helping hospitality firms to hedge global risks. Implementing the stress test methodology and the probabilistic model of default in hotel firms, the authors find that the probability of failure increases for firms with high leverage, low levels of cash, and a higher share of fixed costs. Likewise, the study by Vivel-Bua *et al*. (2016) also deals with prediction of business failure in 836 micro, small and medium-sized Spanish hotel firms in the period 2008 – 2011. Employing probit and logit models the authors find that the probability of failure is positively related with indebtedness and economic structure whereas profitability, general activity, the economic and financial balance, age, liquidity and size are found to be negatively related to probability of default. Furthermore, significant impact is also found regarding the number of delegations, demand level, occupancy rate, seasonality and competitive intensity. Moreover, research by Phung and Nguyen (2025) examines the relationship of corporate culture with the financial stability of US listed hotel firms in the period 2000 – 2021 using four corporate culture dimensions including Collaborate, Control, Create, and Compete of the Competing Values Framework (CVF). Besides that, control variables comprising size, leverage, sales growth and sales variability, cash holding, operating cash flow as well as dummy variables relating to crisis, diversification, having international subsidiaries and being large in size. Using a sample of 47 hotel firms which makes 307 firm-quarter observations, the authors document that corporate culture significantly explains hotel firms' financial stability providing evidence that the extent of this relationship depends on contextual factors. Their findings show that hotel firms with cultures oriented toward individuality and flexibility exhibit less financial stability than firms with cultures focused on stability and control. This relationship is more evident during non-crisis periods when hotel firms are more affected by external economic conditions; among larger hotel firms with a more deeply established corporate culture; and in multi-divisional or multinational hotel firms.

This paper seeks to fill this research gap by examining the determinants of the financial stability of large and medium-sized hotel firms in Croatia in the 2020 – 2024 period. Using a dynamic panel data model, the research analyses the impact of firm-specific factors such as liquidity, leverage, overall business efficiency, earnings per employee, firm size, and firm age as well as Covid dummy on financial stability, measured through a Z-score that integrates profitability, equity buffer, and return volatility.

The paper contributes scientifically in multiple ways. First, it adds to the existing research on the determinants of financial stability extending traditional financial sectors to the tourism

and hospitality industry, where such analyses are still underdeveloped. Second, it provides robust empirical evidence in the Croatian context, enabling a more detailed understanding of how firm characteristics affect financial soundness in a tourism-dependent economy. Third, by applying a methodological approach that involves rolling window for the entire period, the paper improves methodological accuracy and offers practical insights to policymakers and hotel managers for designing targeted risk mitigation strategies, strengthening resilience, and supporting the sustainable development of the Croatian tourism sector.

Thus, the originality of the research arises from tackling a research gap that remains largely underexplored in the existing literature. While prior studies on hotel firms have largely examined profitability or operational efficiency, few have analysed the determinants of financial stability, particularly in small, tourism-dependent economies. To the best of our knowledge, this is the first empirical study that investigates firm-oriented drivers of financial stability among Croatian hotel firms using a dynamic panel dataset and a Z-score stability measure. By doing so, this study provides new evidence that adds to an underdeveloped research area offering insights with direct managerial and policy relevance.

The remainder of the paper is organised as follows. After the introduction which provides a theoretical background of the topic investigated as well as the motivation for such research and explains its scientific contribution, section two provides detailed description of the variables used in the research and their potential impact on financial stability, based on relevant literature. This part also describes the model and the sample. Section three presents empirical findings while section four discusses its theoretical and practical implications. The final part provides conclusion as well as limitations of the study and directions for future research.

2. METHODOLOGY

The dependent variable, Z-score, stands for financial stability or financial soundness. It is introduced in the research following Nguyen *et al*. (2023) combining profitability and equity to asset ratio with the standard deviation of ROA:

$$Z{-}score = \frac{ROA + \frac{E}{A}}{\sigma\ ROA\ (ROA_1, ROA_2, \dots, ROA_t)}$$

with ROA standing for an accounting-based profitability measure, return on assets, calculated as profits after tax to total assets, E/A denotes the equity to assets ratio, while σROA stands for the variability of ROA expressed with the standard deviation of ROA during the entire period of analysis. This approach helps prevent the Z-scores from being solely driven by fluctuations in capital levels and profitability. The Z-score reflects how many standard deviations a company's ROA would need to decline for the company to become insolvent. Therefore, the Z-score serves as an indicator of default risk: the higher the Z-score, the lower the likelihood of a company facing insolvency (Chand *et al*., 2021). Default is likely to happen

if capital is fully consumed by losses, i.e., when ROA equals or falls below the equity-to-assets ratio (Moreno *et al.*, 2022).

In order to investigate dynamic relationships in panel data, this research applies the Arellano-Bond estimator, a Generalized Method of Moments (GMM) procedure presented by Arellano and Bond (1991). Theoretically, such approach is justified by the persistence of financial stability over time and the potential endogeneity of firm-oriented factors. Furthermore, the choice of a dynamic panel model is adequate empirically as well, due to a large cross-sectional dimension and a relatively short time span, while the Arellano-Bond estimator allows valid internal instrumentation through lagged levels and differences of the variables. This specification ensures unbiased and consistent estimates compared with static panel techniques. After differencing the data, the estimator controls for unobserved individual effects, while lagged dependent variable serve as instruments under the assumption of no serial correlation in the error term. This approach reduces endogeneity and improves the reliability of parameter estimates compared with conventional estimators such as fixed effects or ordinary least squares (OLS). Instrument validity and the absence of residual autocorrelation are commonly assessed using the Sargan test and the Arellano-Bond autocorrelation test. The dynamic panel specification with explanatory variables is presented as follows:

$$y_{it}=\mu+ \gamma y_{i,t-1}+ x_{it}' \beta+ \alpha_i+ \varepsilon_{it} , i=1, \ldots, N, \ t=1, \ldots, T,$$

where y_{it} is the dependent variable presented with Z-score, $y_{i,t-1}$ is a lagged dependent variable, x_{it}' is a matrix of type 1×K independent variables discussed below, α_i is an unobserved individual effect and ε_{it} is an unobserved white noise disturbance, while γ and β are regression coefficients.

Regarding the independent variables, the authors, after consulting relevant literature in the field (e.g. Agiomirgianakis *et al.*, 2012; Vivel-Bua *et al.*, 2016; Soni *et al.*, 2022; Nguyen *et al.*, 2023; Ashraf *et al.*, 2025; Phung, Nguyen, 2025), selected a comprehensive set of potential explanatory variables that could serve as determinants of financial stability, with the specific supporting studies discussed in detail in the subsequent sections. These are liquidity, leverage, overall business efficiency, earnings per employee, firm size, and firm age as well as Covid dummy.

Liquidity is employed in the analysis as the current ratio, calculated as current assets over current, i.e. short-term liabilities as in Vivel-Bua *et al*. (2016) and Ashraf *et al*. (2025). It is a generally accepted fact that firms with higher levels of liquidity are better positioned to cover short-term obligations, reducing default risk. However, a high liquidity ratio may indicate that a company is using its resources inefficiently, as it holds them in liquid form rather than investing in profitable business opportunities (Liargovas, Skandalis, 2010). Still, Nafla and Hammas (2016) provide evidence of the positive impact of liquidity on financial stability. Chand et al. (2021), investigating bank stability, point out that a lack of liquidity can lead to a shortage of funds, forcing banks to sell assets at reduced prices. They also add that if liquidity risk persists over a longer period, it can ultimately result in financial insolvency. However,

their findings, among others, indicate that liquidity is negatively associated to stability, thus indicating that holding excess cash in the balance sheet is not desired. Hence, the influence of this variable on financial stability is not clear.

Leverage is frequently identified as an important determinant of financial soundness in prior research and is calculated as total debts over total assets, as in Ashraf *et al.* (2025) when conducting a robustness check and in Vivel-Bua *et al*. (2016), as one of the indebtedness variables. The findings of Orazalin *et al*. (2019) indicate a statistically significant and negative relationship of leverage with the Z-score, suggesting that firms with higher leverage are more financially risky and thus have a greater likelihood of facing bankruptcy. Similarly, on the sample of insurance companies, Moreno *et al*. (2022), instead of leverage, use capitalization, measured by the equity over total assets ratio, finding its positive and statistically significant influence on soundness, which supports the hypothesis that firms with higher capitalization levels tend to have higher Z-scores and lower likelihood of financial distress. Nguyen *et al*. (2023) also add that, given the capital-intensive nature of the hotel industry and the highly leveraged capital structures of hotels, leverage can negatively affect their financial stability. Their findings also support the notion that hotel firms with lower debt levels tend to be more financially stable, on average, compared to those with higher debt levels. Thus, a negative sign of leverage on the Z-score can be expected.

Overall business efficiency represents the ratio of total revenues to total expenses. It is interpreted as a percentage, indicating by how many percent total revenues exceed total expenses. Comprehensibility of this variable, as stated by Osborne (1995), as an efficiency measure is clear. It is expected that it will positively affect financial stability of the firm due to the fact that higher efficiency indicates that the firm generates more revenues compared to its expenses resulting in greater profitability and stronger cash flows. This increases the firm's ability to meet its financial liabilities, reduces insolvency risk and enhances overall financial stability. Besides that, higher efficiency reflects effective managing and optimal use of resources due to which investors' confidence can grow stronger improving the access to external financing. Thus, a positive sign of this variable is expected.

Earnings per employee variable refers to the workforce productivity which is of crucial importance in service sectors like hospitality where human capital is one of the main drivers of success. Bryan (2007) states that it is a good indicator of earnings at the intangible level. Vu *et al*. (2019) add that higher level of competitiveness among firms is related to higher earnings per employee suggesting that firms, while increasing their market share are motivated to increase their productivity. According to Evans *et al*. (2000), low or declining earnings per employee may indicate inefficiencies due to overstaffing, which can negatively affect profitability and, hence, financial stability. Thus, a positive sign of this variable is expected.

Firm size is commonly used as a potential determinant of firm financial stability (e.g. Chand *et al*., 2021; Moreno *et al*., 2022; Nguyen et al. 2023; Phung, Nguyen, 2025). To reflect the firm size, the authors chose the use of the natural logarithm of total employees. The logarithmic values were used to reduce the skewness of the variables' distributions. Using the sample

of Spanish insurance companies, Moreno *et al*. (2022) document the positive effect of firm size on Z-score. They rationalize it with the fact that financially distressed insurers are usually smaller in size. The same is found by Chand *et al*. (2021) on the sample of banks and financial institutions. However, Orazalin *et al*. (2019) find the opposite, indicating that larger firms are less financially stable and riskier than their smaller counterparts. If we look at the influence of hotel size on firm performance in terms of profitability, previous research has shown that hotel size tends to have an ambiguous impact. For instance, Agiomirgianakis, Magoutas, and Sfakianakis (2012) found a positive relationship between hotel size and profitability. Similarly, Dimitrić *et al*. (2019) found a positive effect of hotel size on profitability in Spain and Portugal, attributing it to economies of scale and the fact that larger firms typically have easier and more cost-effective access to capital. However, the latter authors found no statistically significant effect of hotel size on profitability in Greece and Croatia. Moreover, Sami and Mohamed (2014) reported a negative relationship between hotel size and profitability. These mixed findings suggest that the impact of hotel size on financial stability is context-dependent, and its impact cannot be predicted.

Firm age reflects logarithmic value of the number of years since establishing the hotel. It is used in studies on determinants of firm performance and financial stability as well (e.g. Miletic *et al*., 2019; Orazalin *et al*., 2019; Soni *et al*., 2022). The latter authors find the positive impact of age on firm performance. Given that profitability is closely linked to financial stability, it is therefore relevant to explore the extent to which firm age may affect a company's profitability. Yet, the findings regarding the effect of hotel age on profitability remain inconclusive. As noted by Soni *et al*. (2022), consulting various sources, older firms may benefit from accumulated experience, stronger brand recognition, and long-standing business relationships, which can enhance performance. Agiomirgianakis *et al*. (2012) find a positive effect of hotel age on profitability, stating that it reflects "the impact of accumulated learning by doing or incumbent effect". On the other hand, younger hotels may gain a competitive advantage through the use of modern technologies, state-of-the-art infrastructure, attractive pricing strategies, and digital platforms such as online booking systems, factors that can help them draw more customers and increase visibility (Soni *et al*., 2022). Thus, the expected sign of this variable is not clear.

The time frame of the analysis spans 2020 – 2024 period with the years of 2020 and 2021 being significantly hit by the COVID-19 pandemic. Hotel firms, which are the object of the analysis, were particularly affected with the crisis. In situations of crisis, as noted by Crespí-Cladera *et al*. (2021), "financial strength of firms is becoming especially relevant". Hence, the authors desire to determine the potential impact of COVID-19 pandemic on financial stability of hotel firms in Croatia by employing Covid dummy variable which takes the value 1 in the years 2020 and 2021 following Tanjung (2023) and Putra (2024), and zero otherwise. These two years are also selected to present years hit by the pandemic due to the fact that the COVID-19 pandemic caused a 72% and 71% decline in international tourist arrivals in 2020 and 2021, respectively (UN Tourism). The pandemic caused a significant economic downturn, while, according to Ashraf *et al*. (2025, p. 1), "the outbreak of the COVID-19 pandemic exposed and exacerbated

the vulnerability of hospitality and tourism-related firms, causing serious disruption and financial stress." Thus, the negative sign of this variable is expected.

To form the sample, the authors used the Info.BIZ platform provided by the Croatian Financial Agency (Fina). The initial selection included large and medium-sized firms classified under section I of the National Classification of Activities (NKD) – Accommodation and Food Service Activities. Within this section, the focus was specifically on activity 55100 – Hotels and Similar Accommodation. The platform classifies firms according to given size categories, thus by selecting large and medium-sized firms, small and micro firms were excluded from the sample. After obtaining the primary sample, further adjustments were made. In particular, firms that reported negative equity in any of the observed years were omitted, as well as those that did not operate continuously during the five-year period of analysis. Additional companies, for which complete data were not available, were also excluded. The final sample comprises 85 hotel firms that operated in Croatia. All analyses were conducted using data on an annual basis and the statistical software Stata.

3. EMPIRICAL DATA AND RESULTS

The descriptive statistics presented in Table 1 reveal substantial variability across firms in terms of size, profitability, and capital structure.

Table 1. Descriptive Statistics of the Variables Employed in the Research

Variable	Obs.	Mean	Std. Dev.	Min	Max
Z-score	425	22.72138	23.49557	−1.99093	176.7643
Liquidity	425	3.325618	6.589409	0.06935	54.21741
Leverage	425	0.403819	0.245588	0.01474	0.99476
Overall business efficiency	425	1.046054	0.30305	0.019512	3.021089
Earnings/emp	424	3,804.557	28,687.97	−270,767	209,014
Size_emp	424	4.808745	1.046605	0	8.173575
Firm_age	425	23.07059	8.249912	4	50
Covid_dummy	425	0.40000	0.4904753	0	1

Source: Author's calculation

The descriptive statistics are calculated for 425 observations, i.e. 424 observations in the case of variables earnings per employee and hotel size. The results reveal considerable heterogeneity across firms. The average Z-score amounts to 22.72 with a high standard deviation of 23.50, ranging from −1.99 to 176.76, which suggests substantial differences in financial stability among the observed firms. The liquidity exhibits a mean of 3.33 and a very high variability with standard deviation accounting for 6.59, with extreme values up to 54.22, indicating the presence of firms with unusually high liquidity. In contrast, leverage shows a more balanced

distribution, with an average of 0.40 and values between 0.01 and 0.99, suggesting that, on average, firms rely moderately on debt financing.

The variable referring to overall business efficiency achieves a mean value close to 1.05 with relatively low spread, with a standard deviation of 0.30, suggesting consistency across firms in this aspect. However, earnings per employee variable stands out due to its exceptionally high variability ranging from −270,767 to 209,014, which reflects the existence of both highly inefficient and highly efficient firms. Its average amounts to 3,805, but the standard deviation reaches 28,688. Finally, hotel size has a mean of 4.81 with a narrower dispersion due to the fact that standard deviation account for 1.05, indicating that firm size, measured by number of employees, is relatively stable compared to other financial indicators. The variable firm age represents the number of years since the firm has been established. The firms in the sample exhibit an average age of approximately 23 years, with a standard deviation of about eight years, indicating a moderate degree of variation in their maturity. The lower bound of four years emphasizes the presence of younger firms, while the upper bound of 50 years reflects the existence of long-established enterprises. This heterogeneity is empirically important since differences in organizational age may affect firms' performance, resilience, and overall financial stability.

Before proceeding with the panel data analysis, multicollinearity among the independent and dependent variables was investigated, as shown in Table 2.

Table 2. Correlation Matrix

	Z-score	Liquidity	Leverage	Overall business efficiency	Earnings/emp	Size_emp	Firm_age	Covid_dummy
Z-score	1.0000							
Liquidity	0.1288*	1.0000						
Leverage	−0.3747*	−0.2382*	1.0000					
Overall business efficiency	−0.1668*	0.0360	−0.1417*	1.0000				
Earnings/emp	−0.2399*	0.0272	−0.0474	0.6856*	1.0000			
Size_emp	−0.1186*	−0.1507*	−0.0476	0.0879*	0.0756	1.0000		
Firm_age	0.0250	0.0101	−0.3500*	0.1505*	0.1227*	0.3202*	1.0000	
Covid_dummy	−0.0382	0.0193	0.1024	−0.3459*	−0.2911*	−0.1536*	−0.1486*	1.0000

* $p<10\%$

Source: Author's calculation

Table 2 presents the correlation matrix for the variables included in the analysis. Most of the coefficients are relatively low, suggesting that multicollinearity is not a serious concern. The strongest correlation is observed between variables *overall business efficiency* and *earnings/employee*, i.e. 0.69, which indicates a potential overlap in the information these variables capture. Other notable correlations, such as the one between leverage and Z-score (–0.37) or the one between firm age and firm size (0.32), are moderate and within acceptable limits.

In order to further examine multicollinearity, the authors conducted a variance inflation factor (VIF) analysis. The results, shown in Table 3, document that the average VIF is 1.69, with the highest values recorded for overall business efficiency variable amounting to 2.71 and earnings per employee accounting for 2.65. These results confirm that, although certain variables are moderately correlated, all VIF values remain well below the critical thresholds of 5 or 10. This indicates that multicollinearity is unlikely to bias the regression estimates and the model can be considered robust in this respect.

Table 3. VIF Factors

Variable	VIF	1/VIF
Liquidity	1.09	0.915471
Leverage	1.24	0.804567
Overall business efficiency	2.71	0.369373
Earnings/emp	2.65	0.377172
Size_emp	1.15	0.870881
Firm_age	1.28	0.778561
Covid_dummy	1.17	0.854982
Mean VIF	1.69	

Source: Author's calculation

Table 4. Parameter Estimates of Dynamic Panel Model

Variable	Z-score
Z-score L1.	0.3354822** (0.1201391)
Liquidity	0.0116167 (0.0314839)
Leverage	–22.93875*** (3.717529)
Overall business efficiency	1. 561605 (0.9827706)
Earnings/emp	0.00002 (0.0000122)

Size_emp	0.518311 (0.563043)
Firm_age	–0.4036766** (0.1523316)
Covid dummy	0.4050668 (0.4055109)
_cons	29.09721*** (5.466707)
Number of instruments	11
Number of groups	85
Sargan test	*p* value = 0.8504
Arellano-Bond test for autocorrelation - order 2	*p* value = 0.9614

*, **, *** Statistically significant at the 10%, 5%, 1% level, respectively.
Standard errors are between parentheses.

Source: authors' calculation

Table 4 shows the parameter estimates of the dynamic panel model, with the Z-score as the dependent variable. The coefficient of the L1 Z-score, the lagged dependent variable, is positive and statistically significant at the 5% level (0.34), indicating the persistence of financial stability over time. Among the explanatory variables, leverage has a strong and negative effect (–22.94, significant at the 1% level), indicating that higher leverage ratios are associated with a significant decline in financial stability. Firm age is negative and significant at the 5% level (–0.40), indicating that older firms in the sample tend to have lower financial stability.

Other variables, such as liquidity, overall business efficiency, earnings per employee, hotel size, and Covid dummy are not statistically significant, suggesting that they do not have a robust effect on financial stability in this specification.

The diagnostic tests confirm the validity of the model. The Sargan test (p = 0.8504) does not reject the null hypothesis of valid instruments, while the Arellano-Bond test for second-order autocorrelation (p = 0.9614) confirms the absence of serial correlation. These results indicate that the model is well specified and the estimates can be considered reliable.

3. 1 Robustness Check

To additionally check consistency and reliability of the main results, the authors conducted a robustness check using an alternative measure of the size variable, which is based on total assets.

Table 5 Parameter Estimates of Dynamic Panel Model - Robustness Check

Variable	Z-score
Z-score L1.	0.4736688** (0.085036)
Liquidity	0.02246 (0.0462612)
Leverage	−20.23813*** (2.260143)
Overall business efficiency	1.995455 (1.03496)
Earnings/emp	0.0000208 (0.00000113)
Size_asset	−2.210453 (1.001309)
Firm_age	−0.2749134** (0.1379578)
Covid_dummy	0.6743702 (0.3644941)
_cons	62.74754*** (16.01509)
Number of instruments	11
Number of groups	85
Sargan test	*p* value = 0.8927
Arellano-Bond test for autocorrelation - order 2	*p* value = 0.9404

*,**,*** Statistically significant at the 10%, 5%, 1% level, respectively. Robust standard errors are between parentheses.

Source: authors' calculation

The alternative specification serves as a robustness check and confirms the consistency of the results obtained in the baseline model. Substituting firm size based on employees with firm size based on assets does not alter the core findings, suggesting that the estimates are not sensitive to changes in how firm characteristics are measured. The validity of the instruments and the absence of serial correlation are further supported by the Sargan and Arellano-Bond test statistics, both of which yield satisfactory values. Overall, the robustness check strengthens confidence in the reliability of the empirical results.

4. DISCUSSION

By conducting dynamic panel analysis, key insights into the factors that determine financial stability of the Croatian hotel sector are offered, with the particular emphasis on the roles of

financial indebtedness and hotel age. The leverage has a strong and negative effect on financial stability, as suggested by the obtained results, proving that hotels with higher debt levels face increased probability of financial default. Such relationship between leverage and financial stability, which conforms to findings by e.g. Orazalin *et al.* (2019) and Nguyen *et al.* (2023), indicates that excessive debt dependence intensifies the risk of financial distress. Following Calmès, Théoret (2013), leverage is considered to be the key financial indicator of risk which supports the broader theoretical view that high leverage can amplify financial vulnerability (e.g. Fuertes, Serena, 2014; Hung, Chang, 2018). This is in accordance with the pecking order theory that "focuses to finance firm operations with its internally generated sources first i.e. retained earnings" trying to "minimize the firm's insiders-outsiders issues related to information asymmetry by following a particular financing hierarchy" (Ahmadimousaabad *et al.*, 2013 citing Myers, Majluf, 1984 and Myers, 1984). In the industries such as hospitality where revenues are sensitive to seasonal fluctuations and exposure to external shocks and broader economic conditions, such risks become even more prominent. Accordingly, the results highlight existing theoretical expectations that capital structure in cyclical and service-intense industry ought to be particularly conservative to sustain long-term financial soundness. It might be helpful exploring strategies to strengthen equity financing or retain earnings in order to reduce debt dependency.

Additional theoretical contributions are offered with the firm age, being adversely associated with financial stability. Although it is often associated with learning-by-doing benefits, reputation, and accumulated experience, the results suggest that these advantages do not necessarily hold true for financial resilience within the hotel sector. Instead, older firms are likely to be more financially vulnerable compared to younger ones suffering from reduced flexibility and inertia, characteristics consistent with the liability of obsolescence, as noted by Baum and Mezias (1992). Such finding reflects the fact that rigid organizational structures and/or legacy business models deter hotel firms from adapting to changing customer expectations and dynamic market trends. Furthermore, Škuflić, Mlinarić (2015), finding a negative impact of hotel age on profitability, argument it, citing Glancey (1998), stating that older firms are lagging behind market changes and innovations. Blažková, Dvouletý (2018, p. 40) add that "younger firms are likely to respond faster to changes in demand, which may be a more important factor than experience and savings due to the learning effect of older firms". Although long-established hotel firms might benefit from "accumulated 'learning by doing', reputation and loyalty" as suggested by Agiomirgianakis *et al.*, 2012, "younger hotels are usually more modern and prone to implementation of new technologies and services with which they can easily attract more guests" (Dimitrić *et al.*, 2019, p. 1983.). This theoretical perspective can be rationalised with the fact that in industries where service delivery methods, clients' preferences, and operational technologies evolve rapidly, long-established firms may be less capable of adapting to new market dynamics. The empirical results, thus, extend the literature by signifying that in hospitality sector, unlike in more traditional manufacturing ones, age may not be considered an asset but instead a source of strategic rigidity and reduced financial stability.

Observing the overall findings, theoretical understanding of the topic investigated is enriched by connecting financial stability with the decisions on capital structure and life-cycle of the

firm. The findings suggest that the financial resilience is a function of structural decisions such as leverage and organizational flexibility over time. This adds to the literature through empirical findings which confirm that financial stability in hospitality-related industries relies not only on financial decisions management but on the ability of the hotel to become modern and innovative firm that would react to external challenges in a timely and adequate manner.

By extending theoretical implications, the study also offers practical insights. As for hotel managers, strong and negative impact of leverage highlights both the need to reduce excessive debt dependence as well as the importance of maintaining balanced capital structure. Internal sources of financing might diminish the financial vulnerability. Hotel firms operating in the market for a long period of time should give priority to innovations in services, structural flexibility and digital transformation with the aim of reducing organizational rigidities and enhancing long-term soundness. Policymakers, particularly those involved in creating strategic goals in tourism, can rely on the findings as well especially when creating financial support and innovation incentive programs encouraging competitiveness and resilience in the hospitality sector.

Overall, by providing empirical assessment of factors determining financial stability of Croatian hotel firms, this study adds to the field. The findings offer theoretical understanding of the topic investigated, particularly in terms of roles leverage and age play in defining financial stability, as well as practical insights for strengthening financial foundations of hotel firms. These contributions enhance the understanding of how hotel firms can increase their stability in a highly competitive and volatile environment and provide a basis for future research in tourism finance.

5. CONCLUSION

By conducting this study, the determinants of financial stability of medium-sized and large hotel firms in Croatia in the period 2020 – 2024 are analysed. Applying dynamic panel model, the authors estimate the impact of firm-oriented factors comprising liquidity, leverage, overall business efficiency, earnings per employee, hotel size, and firm age. Since the time frame of the analysis also covers the period hit by the pandemic, Covid dummy variable has been employed as well while the financial stability is expressed with the Z-score.

After conducting the analysis, it is revealed that leverage and firm age are found to be statistically significant determinants of financial stability in the Croatian tourism sector. Specifically, indebtedness is found to have a negative effect on financial stability, suggesting that higher level of leverage increases the risk of default among hotel firms. Also, firm age is found to have a negative relationship with financial soundness, implying that older hotel firms in Croatia are more prone to financial vulnerability compared to their younger counterparts, probably due to organizational structural rigidities or legacy business models preventing them from adaptating to ever-changing market trends.

The conducted analysis determined leverage and hotel age to be statistically significant factors of financial stability in Croatian hotel sector. Namely, it was established that indebtedness has

a negative effect on financial stability, which indicates that a higher level of debt increases the insolvency risk among hotel firms. Moreover, hotel age also shows negative relationship with financial stability implying that older hotel firms in Croatia are more prone to financial vulnerabilities than their younger counterparts, probably due to organizational rigidities or outdated business models preventing the adaptability to ever-changing market conditions.

These results offer important implications for hotel managers as well as policymakers. The reduction of debt dependance and development of organizational flexibility should be considered a priority in order to enhance financial stability of hotel firms. Furthermore, strategies for long-established hotels including innovations, technological modernization as well as organizational transformation might improve their financial resilience and long-term sustainability.

The authors are, however, aware of the limitatios of this study since it is oriented towards medium-sized and large hotel firms limiting the applicability of the findings to the entire hotel sector. Secondly, the model mostly relies on firm - specific factors omitting industry-specific and macroeconomic variables that might influence financial stability as well. Furthermore, the study covers a five-year period which may not reflect long-term structural dynamics entirely. These limitations may serve as a foundation for future research which might include expansion of the time frame of the analysis as well as the inclusion of small hotel firms, integration of external macroeconomic variables, and comparison with other countries in order to further deepen the understanding of financial stability drivers in the tourism and hospitality sector.

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ŠTO ODREĐUJE FINANCIJSKU STABILNOST HOTELSKIH PODUZEĆA U HRVATSKOJ?

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SAŽETAK

Istraživanje financijske stabilnosti poduzeća privuklo je pozornost istraživača posljednjih nekoliko desetljeća. Činjenica da je fokus ovih istraživanja bio uglavnom na financijskim institucijama, posebice bankama i društvima za osiguranje, ne umanjuje važnost istraživanja financijske stabilnosti hotelskih poduzeća, posebno u zemljama u kojima turizam značajno doprinosi rastu BDP-a. Stoga su autori proveli istraživanje kako bi procijenili čimbenike koji određuju financijsku stabilnost srednjih i velikih hotelskih poduzeća koja su poslovala u Hrvatskoj u razdoblju od 2020. do 2024. godine. U istraživanju je korištena dinamička panel analiza s ciljem procjene utjecaja različitih poduzeću svojstvenih čimbenika, a to su likvidnost, zaduženost, ukupna poslovna učinkovitost, zarada po zaposleniku, veličina tvrtke i starost tvrtke. Osim toga, s obzirom na to da vremenski okvir analize uključuje i godine u kojima je poslovanje hotela bilo značajno pogođeno COVID krizom, autori su tu činjenicu uzeli u obzir uvođenjem COVID dummy varijable. Rezultati analize pokazuju da su zaduženost i starost poduzeća značajni čimbenici koji negativno utječu na financijsku stabilnost hotelskih tvrtki u malom, o turizmu ovisnom gospodarstvu. Originalnost ovog rada proizlazi iz njegove orijentacije na financijsku stabilnost hotelskih tvrtki u malom, o turizmu ovisnom gospodarstvu, pružajući empirijske dokaze o poduzeću svojstvenim odrednicama financijske stabilnosti korištenjem dinamičkog panel modela, što ga pozicionira kao jednu od prvih sveobuhvatnih analiza financijske stabilnosti u hrvatskom hotelskom sektoru.

Ključne riječi: *Hrvatska, financijska stabilnost, determinante, hotelska poduzeća*