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When Does Leverage Become Dangerous? Threshold Effects and Post-COVID Financial Fragility of Turkish Tourism Firms

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Abstract

This study examines the nonlinear, threshold-dependent relationship between financial leverage and firm performance in publicly traded tourism firms in Turkey, and investigates how this relationship has evolved under post-COVID-19 multi-shock conditions. The main aim of the research is to identify the thresholds at which borrowing becomes a source of financial vulnerability and to analyse how this process deepens under macroeconomic shocks. For this purpose, quarterly panel data covering the period from Q1 2012 to Q1 2025 for 22 tourism firms listed on Borsa Istanbul were used. Firm performance was measured through accounting-based indicators Return on Asset(ROA) and Return on Equity(ROE), and a market-based indicator (stock returns). In the empirical analysis, both the random-effects panel regression model and the endogenous-threshold panel regression methods were applied. The findings indicate that the relationship between financial leverage and performance is nonlinear, and a significant regime change occurs when the leverage ratio exceeds approximately 60–70%. In the post-COVID-19 period, both accounting-based and market-based performance indicators under high-leverage regimes became more sensitive to financial vulnerability. Additionally, the effects of the real effective exchange rate and the service sector price index on firm performance have strengthened in the post-crisis period. The study reveals that financial fragility in the tourism sector is a structural feature sensitive to thresholds and crisis regimes rather than temporary shocks. In this regard, the research highlights the limits of debt-based growth strategies and contributes to early warning mechanisms for policymakers, investors, and firm managers.

Keywords: tourism industry performance; leverage dynamics; financial fragility; exchange rate competitiveness; macro-financial risks

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1. Introduction

The financial structures of tourism businesses are inherently fragile both operationally and financially due to revenue cycles that are highly sensitive to external shocks. These structural characteristics render the relationship between financial leverage and firm performance highly nonlinear and regime-dependent, particularly in sectors such as tourism, where exposure to macroeconomic shocks is persistent. Over the past decade in Turkey, the tourism sector has operated amidst multiple overlapping crises, including the pandemic, geopolitical tensions, large-scale natural disasters, regional conflicts, and global price volatility, often occurring simultaneously (Ming & Liu, 2021). Therefore, it is increasingly important to evaluate the factors influencing the financial performance of tourism businesses not only through internal indicators but also through macro indicators that reflect competitive strength and cost pressures. The main contribution of this study is

questioning the assumption that the relationship between financial leverage and firm performance in the tourism sector exhibits a linear structure and analysing this relationship within a threshold-based and regime-dependent framework. The study shows that the effects of borrowing on performance vary with leverage level, and that financial fragility deepens structurally when certain thresholds are exceeded. In this regard, the research goes beyond an analysis that describes performance under multiple shocks, empirically revealing under what conditions financial fragility in tourism firms rapidly increases. This study examines the nonlinear and threshold-dependent effects of financial leverage on both accounting-based (ROA, ROE) and market-based (stock returns) performance indicators, using quarterly panel data from 22 tourism firms listed on Borsa Istanbul over the period Q1 2012–Q1 2025. The analysis systematically investigates how the capital structure functions across multiple crisis periods, through which channels external shocks are reflected in firm performance, and, especially, how the effects of the real effective exchange rate (REER) and the Service Producer Price Index (SPPI) influence sectoral competitiveness and cost structure. Thus, a holistic analysis is presented that evaluates both micro (internal firm) and macro (economic and competitive) factors related to the financial resilience of tourism businesses.

The article is structured as follows: In the second section, studies on capital structure, external shock mechanisms, financial flexibility, digital transformation, and governance are critically examined to develop research hypotheses. The third section presents the dataset, variable definitions, and the panel regression method applied. The fourth section presents the empirical findings and robustness checks. The fifth and final section discusses the results in the context of capital structure theories and sectoral frameworks, offering policy recommendations and evaluating future research directions.

2. Literature Review

Studies aimed at explaining the financial performance of the tourism sector highlight the need for multidimensional approaches that jointly evaluate capital structure, external shocks, financial flexibility, digital capacity, and governance, given the sector's structural vulnerabilities. The high volatility in demand and revenue cycles makes the relationship between financial leverage and performance in tourism businesses more sensitive than in other sectors; especially during periods of increased information asymmetry and rising costs of financial distress, leverage levels can reduce profitability. Long-term research on Turkey reveals a persistent negative relationship between financial leverage and accounting-based performance indicators (ROA and ROE), supporting the Pecking Order approach, which prioritises internal resource use over external financing during uncertain times (Helhel, 2026; Helhel & Helhel, 2026). Additionally, the responses of market-based performance indicators to geopolitical and systemic shocks—particularly through risk premiums—are consistent with the Trade-off approach, which emphasises balancing tax shields and the costs of financial distress in investors' capital-structure pricing decisions (Helhel, 2026; Dogah, 2021). This framework shows that capital structure in tourism businesses is not a unidirectional determinant of performance but rather a dynamic mechanism that interacts with macro and internal firm factors. An important but often overlooked aspect of this dynamic interaction structure is the internal financial reporting and earnings management behaviours of firms. Kliestik et al. (2022), in their empirical analysis of tourism companies in Central and Eastern Europe, show that earnings management practices intensify during periods of uncertainty and crisis, and these behaviours can mask the true financial vulnerability levels of firms. This finding suggests that leverage-based performance analyses that rely solely on balance sheet ratios may underestimate the risks associated with debt (Kliestik et al., 2022). The empirical literature on external

shocks consistently shows that the tourism sector is highly sensitive to macroeconomic and geopolitical developments. It has been supported by multivariate volatility models (BEKK/VARMA-AGARCH) that show strong spillover effects from exchange rate returns to tourism company stock returns, with these spillovers mostly involving negative co-movements. These studies show that the relationship between financial leverage and performance in the tourism sector exhibits a nonlinear structure due to the sector's high demand volatility, fixed cost structure, and vulnerability to macroeconomic shocks. Exchange rate shocks, geopolitical risks, and pandemic periods create critical breaking points that amplify the impact of leverage levels on profitability and market performance.

The impact of exchange rate risk through both contagion and diversification channels makes the tourism sector vulnerable to international financial fluctuations. Similarly, shocks in global commodity prices have been shown to produce heterogeneous effects in sectors related to tourism, with particularly notable risk transmissions from oil price shocks affecting European tourism businesses. In Turkey specifically, the COVID-19 pandemic, the 2023 earthquakes, and regional geopolitical tensions that coincided in the same period have led to declines in the profitability of tourism companies and increased sensitivity to leverage; it has been observed that stock returns react suddenly and strongly to geopolitical news flows and risk premiums. These findings indicate that external shocks influence firm performance not through a single fixed effect but via multiple channels such as competitiveness, cost structure, and financing conditions. The real effective exchange rate (REER) plays a central role in these mechanisms; an appreciation of the national currency's real value weakens international price competitiveness, negatively affecting both operational profitability and market expectations (Chang et al., 2013). This multi-channel impact structure clearly demonstrates the inadequacy of evaluating financial performance in the tourism sector using unidimensional indicators. Čabinová et al. (2021) show that for spa and medical tourism businesses, multi-criteria performance and effectiveness models reveal that the impact of debt ratios on firm performance is meaningful only within the context of operational efficiency and value-creation capacity. Similarly, Štefko et al. (2020) emphasise that the leverage effect in spa businesses is not linear; when evaluated together with internal efficiency indicators such as asset turnover and sales profitability, financial vulnerability becomes more apparent.

Financial flexibility (FF) is a critical factor in the literature for determining a company's resilience during periods of uncertainty (Fortin et al., 2023; Gao et al., 2019; Junttila & Vataja, 2018). Findings from the COVID-19 period indicate that the relationship between financial flexibility and performance is mostly inverse-U shaped; financial flexibility supports performance up to certain thresholds, but beyond these thresholds, carrying costs begin to outweigh the benefits (Zhang et al., 2022a). The differences between asset-light and asset-heavy models in hotel operations reveal that financial flexibility is a capacity shaped by the individual firm (Zhang et al., 2022b). In Turkey, during periods of shock, the negative relationship between leverage and performance becomes even steeper due to interest burdens and costs of financial distress (Helhel, 2026). These results demonstrate that financial flexibility is directly related to the ability to manage capital costs and maintain liquidity positions during crises.

In this context, financial flexibility can be considered an intermediate mechanism that is not directly observable in leverage analyses but is decisive for the outcomes. While financial flexibility allows borrowing performance to be supported up to a certain threshold, exceeding these thresholds turns leverage into a factor that reduces flexibility and rapidly increases financial vulnerability (Zhang et al., 2022b; Helhel, 2026).

In the era of multiple shocks, the importance of internal competencies within firms increasingly influences performance determination. It has been shown that tourism busi-

nesses with a high level of digital transformation achieve better financial results and ESG performance during the COVID-19 pandemic (Liu et al., 2024). This advantage is further strengthened by the depth and willingness to diversify the business; internal capabilities such as technology, data utilisation, and channel management are found to be as decisive as leverage policies during crisis periods (Liu et al., 2024; Torres & Augusto, 2021). Digital capacity thus becomes a natural complement to financial flexibility.

Recent studies indicate that these internal capacities are complemented by corporate social responsibility (CSR) and financial management practices. Poliakova et al. (2024), in their structural equation model analysis of SMEs in the service sector, found that the impact of financial management on sustainability is stronger than that of CSR; however, CSR practices statistically significantly support both financial management and sustainability levels. These findings suggest that financial vulnerability in tourism businesses is influenced not only by their balance sheet structure but also by managerial and institutional capacity.

The role of governance quality and sustainability-focused corporate practices in the tourism sector on crisis resilience has also been strongly supported in the literature. It has been found that companies with CSR committees or high ESG scores exhibit lower stock volatility after the pandemic; it has also been shown that CEO duality (when the CEO is also the chairman of the board) has a positive effect only when combined with strong ESG/CSR practices (Torres & Augusto, 2021). In the context of Turkey, considering the sensitivity of stock returns to geopolitical news flow, it is evaluated that ensuring social legitimacy and governance flexibility together can create a protective mechanism against risk premiums (Helhel, 2026; Torres & Augusto, 2021). This holistic framework indicates that the financial and operational resilience of tourism businesses to multiple shocks depends on the interplay among capital structure, liquidity, digital capacity, and governance. Although financial flexibility, digital capacity, and governance quality are not directly observable in the present dataset, they provide the conceptual framework for interpreting leverage thresholds and post-COVID fragility. In this study, elements such as digital transformation, corporate governance, ESG/CSR practices, and financial flexibility were not directly included in the empirical model. The main reason is the lack of firm-specific, quarterly, and time-consistent data on these concepts. However, the literature strongly emphasises that these factors determine a tourism company's borrowing capacity during crisis periods, its ability to manage debt, and its resilience against financial vulnerabilities. Therefore, these concepts are not treated as directly testable variables; instead, they are considered as underlying mechanisms that shape the formation and effects of the leverage ratio. Within this framework, financial leverage functions as a composite result of a company's managerial capacity, flexibility, and corporate structure and is therefore interpreted as a 'reduced-form indicator.' In other words, in this study, the leverage ratio is not only a balance sheet ratio but also serves as an indirect proxy for the company's capacity to adapt to multiple shocks. In this sense, leverage serves as a reduced-form proxy for firms' adaptive capacity under multiple shocks.

3. Data and Econometric Models

This study uses a panel dataset comprising 53 quarterly observations from 2012Q1 to 2025Q1 for 22 tourism companies listed on Borsa Istanbul in Turkey. The sample of this study is limited to companies listed under the main activity codes 'Tourism' and 'Accommodation' on Borsa Istanbul. Transportation and airline companies were excluded from the sample because their asset structures and revenue dynamics differ significantly. The choice of quarterly data allows for a more precise capture of demand fluctuations and external shocks that frequently occur in the tourism sector. The panel dataset used in the study covers the period from 2012Q1 to 2025Q1 for 22 tourism companies traded on Borsa

Istanbul. Theoretically, there are 53 quarterly observations for each company; however, due to missing financial reports for certain periods in some companies, the panel structure is unbalanced. In this context, the total number of observations used in the analysis is 829, and this value pertains to the entire panel, not per company.

3.1. Data Sources

Company-level financial and accounting indicators have been compiled from Public Disclosure Platform (KAP) notifications. The companies included in the sample are primarily businesses that serve tourists coming to Turkey (incoming). Therefore, the findings do not directly represent the financial risk dynamics of outbound tourism. Stock returns are calculated quarterly using the closing prices of the relevant companies on Borsa Istanbul. The macroeconomic indicators include the real effective exchange rate (REER), obtained from the Central Bank of the Republic of Turkey's database (with 2010 = 100 as the base year or the most recent series), and the producer price index for services (SSPI), which is sourced from the CBRT–EVDS or TÜİK databases. The study also employs a composite SHOCK that includes quarters during which various types of crises occurred, such as the COVID-19 pandemic, large-scale earthquakes, geopolitical tensions, and political events. The inclusion of REER and SSPI variables in the model aims to more accurately capture the tourism sector's sensitivity to exchange rate competitiveness and service cost pressures.

3.2. Variable Definitions

Dependent Variables

- ROA (Return on Assets): Net profit divided by total assets.
- ROE (Return on Equity): Net profit divided by total equity.
- SR (Stock Return): Quarterly stock return for the corresponding period.

Main Independent Variable

- FINLEV (Financial Leverage): Total liabilities divided by total assets.

Control Variables

- SIZE: Natural logarithm of total assets.
- QUICK ratio: is calculated as current assets excluding inventories, divided by short term liabilities.

Macroeconomic Variables

- REER (Real Effective Exchange Rate): A trade-weighted index reflecting the real value of the Turkish lira. An increase in REER may reduce international price competitiveness; thus, ROA and ROE are expected to decline.
- SSPI (Service Producer Price Index): Captures producer prices in the service sector. Higher SSPI values indicate rising cost pressures, which are expected to affect profitability negatively.

External Shock Indicator

- **SHOCK = 1:** A health-related, geopolitical, natural-disaster, or political shock occurred in the corresponding quarter.
- **SHOCK = 0:** Otherwise.

This indicator is designed to capture the **aggregate impact** of external shocks rather than distinguishing which specific shock type is more influential.

3.3. Modelling Approach

In the empirical analysis, panel data regression was used. Pooled OLS, fixed-effects (FE), and random-effects (RE) models were compared. However, linear panel specifica-

tions may obscure regime-specific dynamics in sectors such as tourism, where financial vulnerability is expected to intensify non-proportionally beyond certain leverage levels. To explicitly capture potential structural breaks and regime shifts in the leverage–performance relationship, this study employs an endogenous panel threshold regression approach, which allows the marginal effect of financial leverage on firm performance to differ across leverage regimes rather than imposing a single functional form. Based on the Hausman, F-test, and Breusch–Pagan LM test results, the Random-Effects (RE) approach was selected as the main model.

In this study, the linear panel regression model serves to evaluate the average relationship between financial leverage and firm performance within a standard benchmark framework. This specification reflects the conventional approach widely adopted in the literature and provides a baseline reference. The endogenous panel threshold regression, on the other hand, constitutes the study's core analytical contribution. This approach allows the leverage–performance relationship to vary across different leverage regimes and explicitly tests whether structural shifts occur beyond certain threshold levels. Accordingly, while the linear model serves as a benchmark comparison tool, the threshold model offers a complementary and deeper framework that captures regime-dependent financial fragility.

There are two main reasons for choosing the RE model: (1) tourism businesses have structural characteristics at the firm level that do not change much over time, and (2) the RE approach ensures more consistent and interpretable coefficients by simultaneously controlling for both firm-specific unchanging effects and quarterly period fixed effects. In the models, quarterly period fixed effects (τ_t) were used to control for macroeconomic common shocks affecting all firms simultaneously. In this way, the effects of external conditions that are not differentiated across firms were removed from the model, ensuring that the coefficients reflect the firms' internal financial dynamics.

The same set of independent variables has been used in the three models below; thus, the comparability of the effects of financial structure and macro indicators on different performance measures has been maintained. Each model is estimated separately; therefore, the coefficients (β) may differ across models despite having the same notation

Modal 1-ROA:

$$\mathrm{ROA}_{i,t} = \alpha + \beta_1 \mathrm{FINLEV}_{i,t} + \beta_2 \mathrm{SIZE}_{i,t} + \beta_3 \mathrm{QUICK}_{i,t} + \beta_4 \mathrm{REER}_t + \beta_5 \mathrm{SSPI}_t + \gamma\, \mathrm{SHOCK}_t + \tau_t + u_i + \varepsilon_{i,t}$$

Modal 1-ROE:

$$\mathrm{ROE}_{i,t} = \alpha + \beta_1 \mathrm{FINLEV}_{i,t} + \beta_2 \mathrm{SIZE}_{i,t} + \beta_3 \mathrm{QUICK}_{i,t} + \beta_4 \mathrm{REER}_t + \beta_5 \mathrm{SSPI}_t + \gamma\, \mathrm{SHOCK}_t + \tau_t + u_i + \varepsilon_{i,t}$$

Modal 1-SR:

$$\mathrm{SR}_{i,t} = \alpha + \beta_1 \mathrm{FINLEV}_{i,t} + \beta_2 \mathrm{SIZE}_{i,t} + \beta_3 \mathrm{QUICK}_{i,t} + \beta_4 \mathrm{REER}_t + \beta_5 \mathrm{SSPI}_t + \gamma\, \mathrm{SHOCK}_t + \tau_t + u_i + \varepsilon_{i,t}$$

Extreme values in the financial leverage (FINLEV) and stock return (SR) variables were not mechanically filtered out of the analysis. This was a deliberate modelling choice. The tourism sector is characterised by pronounced volatility, particularly during periods of pandemics and overlapping macroeconomic shocks, which may generate exceptionally high leverage ratios and abrupt market reactions. Therefore, these extreme observations were interpreted as reflecting sectoral conditions rather than data errors.

Nevertheless, to assess the sensitivity of the main findings to potential outliers, alternative robustness checks were conducted. Across different model specifications, the

direction and statistical significance of the key coefficients remained qualitatively unchanged. These results indicate that the empirical findings are not driven by a limited number of extreme observations.

3.4. Summary Statistics

Descriptive statistics (Table 1) show that the variables exhibit a wide distribution throughout the period. The low averages of ROA and ROE indicate that tourism businesses in Turkey generally have limited profitability; the high standard deviations suggest significant fluctuations across periods. The wide range of the SR variable confirms the volatile nature of market returns. The high mean of the FINLEV variable indicates a high level of indebtedness across the sector. The high variation in the QUICK ratio suggests notable differences in liquidity across firms. The broad range in the REER and SSPI series indicates that during the analysis period, the Turkish economy experienced significant currency fluctuations and rising service costs. This diversity confirms that panel data analysis is an appropriate method for explaining sector dynamics.

Table 1. Descriptive statistics.

Variable	Mean	StdDev	Min	Max	Obs
ROA	0.0205	0.1177	−1.3598	0.9304	829
ROE	0.0128	0.2566	−2.5754	0.7308	829
SR	0.1380	0.4462	−1.2347	5.0640	829
FINLEV	0.4277	0.5151	−0.2315	7.6081	829
LOGASSET	8.4402	1.7894	−0.2315	12.1861	829
QUICK	2.5300	3.4995	−0.2315	21.2193	829
REER_CPI	78.7501	21.5787	51.5200	119.8900	829
SSPI	374.4887	461.0498	9.5600	1507.7300	829

Figure 1 illustrates that the relationship between financial leverage and asset profitability is nonlinear and exhibits a structural change beyond a certain leverage level. The figure shows that ROA behaves differently across low- and high-leverage regimes, and that when the leverage ratio exceeds a specific threshold, the effect on performance shifts the regime. This visual finding supports the panel threshold regression results, confirming that leverage-related fragility varies across thresholds. In Figure 1, the dashed vertical line indicates the endogenously estimated leverage threshold. The solid line represents the fitted regime-specific effects derived from the panel threshold model, while the dots correspond to firm-level observations.

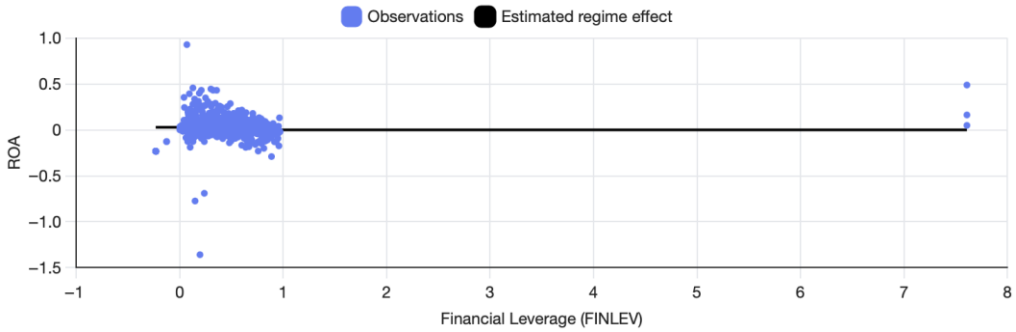


Figure 1. Financial leverage threshold and regime effects on return on assets (ROA).

The Spearman correlation matrix (see Table 2) reveals the direction and strength of relationships among the main variables used in the study. It provides an important preliminary analysis for assessing the risk of multicollinearity.

Table 2. Spearman correlation matrix and multicollinearity analysis.

Row	ROA	ROE	SR	FINLEV	LOGASSET	QUICK	REER_CPI	SSPI
ROA	1							
ROE	0.962	1						
SR	0.225	0.226	1					
FINLEV	−0.042	−0.011	0.024	1				
LOGASSET	0.083	0.122	0.108	0.450	1			
QUICK	0.493	0.435	0.106	−0.400	−0.183	1		
REER_CPI	−0.265	−0.246	−0.241	−0.019	−0.435	−0.155	1	
SSPI	0.219	0.206	0.197	−0.007	0.462	0.137	−0.906	1

The high correlation between ROA and ROE is a natural result, as both indicators reflect financial profitability in similar ways. The low-to-moderate correlations of macroeconomic and balance-sheet-based variables, such as FINLEV. REER_CPI and SSPI, along with profitability indicators, indicate no excessive co-movement that could lead to multicollinearity in the models. The positive relationship between the QUICK variable and ROA and ROE suggests that as liquidity levels increase, ROA and ROE increase. financial performance strengthens; meanwhile. The strong negative correlation between REER_CPI and SSPI clearly reflects the opposite dynamics between exchange rate movements and service costs during the analysis period in Turkey. Overall, the table shows that the independent variables in the model are reasonably correlated. However, do not indicate multicollinearity, as it could distort the regression estimates.

The VIF results (see Table 3) assess multicollinearity among the study's independent variables—the VIF values for FINLEV. The LOGASSET and QUICK variables, with values around 1, indicate no significant linear dependence among them. Although the VIF values for the macro variables REER (CPI-based) and SSPI are higher than those of the other variables, all VIF values are below 2, suggesting that there is no evidence of multicollinearity. These results demonstrate that the variables used in the panel regression models are statistically reliable and that the coefficient estimates are not at risk of multicollinearity-induced bias.

Table 3. VIF Results.

Variable	VIF
FINLEV	1.1286
LOGASSET	1.2361
QUICK	1.0454
REER_CPI	1.8469
SSPI	1.8687

3.5. Hypothesis

The literature reviewed indicates that the relationship between financial leverage and firm performance in the tourism sector cannot be adequately explained through linear frameworks alone. Prior studies emphasise that tourism firms operate under high

uncertainty are strongly exposed to macroeconomic shocks and exhibit structural characteristics such as high fixed costs and demand volatility, which make financial outcomes regime-sensitive (Bagirov & Mateus, 2019). In this context, financial leverage may support performance up to certain levels, while surpassing critical thresholds is increasingly associated with a rapid deepening of financial vulnerability.

Moreover, there is strong evidence that extraordinary shocks, such as the COVID-19 pandemic, have structurally altered the transmission mechanisms linking leverage to firm performance beyond temporary fluctuations. At the same time, the asset pricing literature highlights that market-based performance indicators respond more quickly and more strongly to macroeconomic uncertainty and changes in risk perception than accounting-based indicators (Demir & Ersan, 2018). Finally, exchange rate competitiveness and service-sector cost dynamics emerge as key macroeconomic channels shaping the financial resilience of tourism firms in open, inflation-sensitive economies.

Based on this theoretical and empirical framework, the following hypotheses are formulated to examine the nonlinear, regime-dependent nature of leverage-related fragility and its interaction with macroeconomic channels among tourism firms in Turkey.

H1. *Financial leverage exhibits a nonlinear, threshold-dependent relationship with firm performance in the tourism sector, with the magnitude and direction of this relationship varying across different performance measures.*

H2. *The leverage–performance relationship becomes more fragile and regime-sensitive in the post-COVID period.*

H3. *Market-based performance indicators react more strongly and more rapidly to leverage-related fragility than accounting-based performance indicators.*

H4. *Exchange rate competitiveness and service-sector cost pressures amplify financial fragility, particularly under high-leverage regimes.*

4. Results

The empirical findings presented in this section are aimed at testing the hypotheses developed in the previous part. The nonlinear and threshold-dependent structure of the relationship between financial leverage and firm performance is examined separately for accounting-based performance indicators (ROA and ROE) and market-based performance indicators (stock returns), as presented in Tables 4–6. In this context, whether the leverage–performance relationship is sensitive to thresholds is evaluated within the scope of H1 through panel threshold regression results and Figure 1. The question of whether the COVID-19 pandemic has regime-shifted this relationship is tested within the scope of H2 through threshold analyses comparing pre- and post-pandemic periods, with the corresponding results presented in Tables 7–9. Differences in the responses of accounting-based and market-based performance indicators to leverage-induced vulnerabilities are addressed within the framework of H3 and visualised in Figure 2, which summarises and compares how firm performance varies across low- and high-leverage regimes defined by threshold analysis. As clearly seen in the figure, accounting-based performance indicators (ROA and ROE) and the market-based performance indicator, stock returns, respond differently to the same leverage regimes. In particular, the weakening of accounting-based indicators at average levels under high-leverage regimes suggests that financial fragility suppresses firms' internal performance amid rising debt burdens. Conversely, market-based performance indicators respond more quickly and sharply to this fragility, pricing financial risks early. From this perspective, this figure provides an intuitive reflection of

the sensitivity of financial fragility to leverage regimes and offers a visual summary of the findings obtained from threshold regressions.

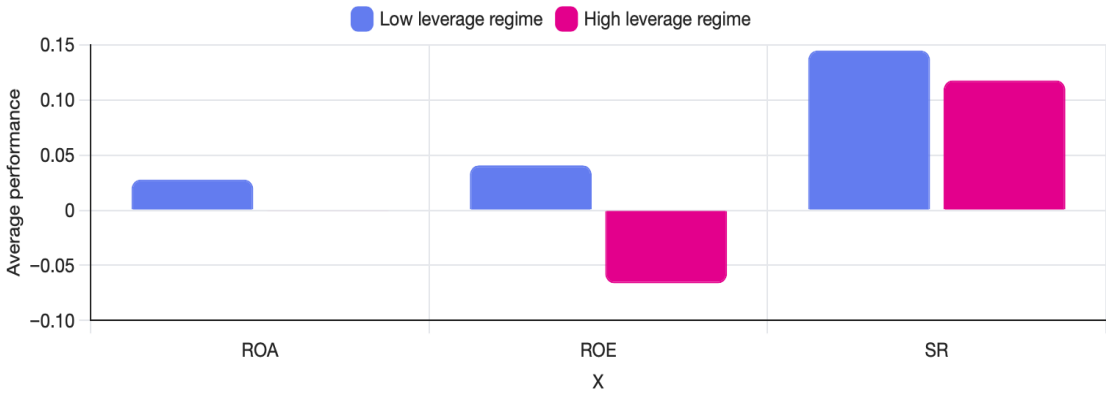


Figure 2. Comparison of accounting-based and market-based performance indicators across leverage regimes.

Finally, the role of exchange rate competitiveness and service-sector cost pressures in amplifying financial vulnerability—particularly under high-leverage regimes—is examined within the scope of H4, supported by the relevant regression results and Figure 3.

The heat maps in Figure 3 compare the relationships among financial leverage, firm performance, and macroeconomic indicators before and after the pandemic. The visualisation particularly reveals that indicators reflecting the real effective exchange rate and service-sector costs after the pandemic exhibit stronger correlations with both accounting-based and market-based performance variables. This finding supports empirical results indicating that financial vulnerability has deepened not only through internal firm dynamics but also via macroeconomic channels following COVID-19.

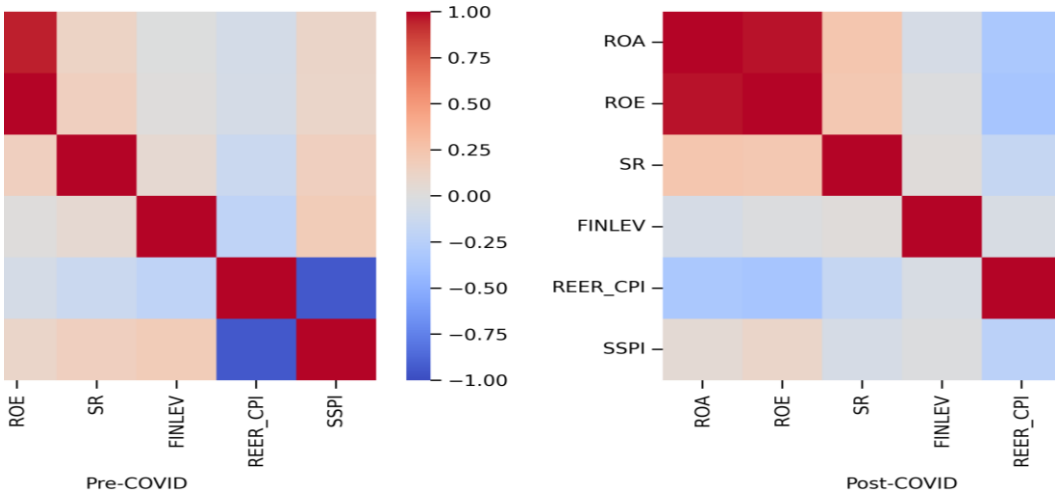


Figure 3. Spearman correlation heatmaps for firm-level variables in the pre-COVID and post-COVID periods.

Conversely, the lack of a significant effect from the producer price index for services (SSPI) and the composite shock indicator (SHOCK) indicates that cost pressures and seasonal shocks do not systematically affect ROA in the short term. This result does not imply that external shocks are irrelevant; rather, it indicates that their effects are largely transmitted through macroeconomic channels, such as exchange rate competitiveness and service-sector cost dynamics, which are explicitly captured by the REER and SSPI variables,

as well as by common time effects. Overall, the model demonstrates that both balance sheet structure and macroeconomic competitive conditions simultaneously influence profitability in the tourism sector.

Empirical results indicate that two seemingly contradictory theoretical approaches are not mutually exclusive. They provide evidence that different capital-structure theories operate through distinct performance channels. Specifically, the negative relationship between leverage and accounting-based performance indicators (ROA and ROE) is consistent with the pecking-order theory, which suggests that more profitable tourism firms rely less on external debt financing due to information asymmetry and financing costs. Tables 4 and 5 report the main factors influencing return on assets (ROA) and return on equity (ROE), respectively.

The regression results below show the impact of key financial and macroeconomic variables on the active profitability (ROA) of tourism enterprises. The estimated random effects and period fixed effects in the model account for both firm-level. time-invariant differences and quarterly macro shocks. The findings indicate that firm size (LOGASSET) and liquidity (QUICK) have a strong, positive effect on profitability. Whereas REER appreciation statistically significantly reduces ROA. The positive and statistically significant coefficient of financial leverage (FINLEV) at the 5% level suggests that during periods dominated by crises and external volatility. Borrowing can move in tandem with profitability under certain conditions. To better understand the positive leverage effect observed in the ROA model, it is useful to examine how financial leverage evolved throughout the multi-shock period. The trajectory of leverage ratios shows that firms increased borrowing during crisis episodes, particularly during the pandemic.

Table 4. Panel regression results for Return on Assets (ROA).

Row	Estimate	Standard Error	t-Stat	*p*-Value	Significance
(Intercept)	−0.0407	0.0352	−1.1546	0.2486	n.s.
FINLEV	0.0156	0.0079	1.9816	0.0479	**
LOGASSET	0.0144	0.0024	6.1087	0.0000	***
QUICK	0.0074	0.0011	6.6357	0.0000	***
REER_CPI	−0.0010	0.0003	−3.6763	0.0003	***
SSPI	0.0000	0.0000	−0.8535	0.3936	n.s.
SHOCK	−0.0053	0.0097	−0.5456	0.5855	n.s.

Note: *** and ** indicate statistical significance at the 1% and 5% levels, respectively. n.s.: Non significant.

The panel regression results (see Table 5) evaluate the impact of financial and macroeconomic factors on the return on equity (ROE) of tourism enterprises. The model controls for time-invariant firm-specific characteristics through random effects and for period shocks via quarterly fixed effects, thereby more clearly revealing the components that influence ROE. According to the findings, firm size (LOGASSET) and the liquidity indicator (QUICK) have strong, statistically significant positive effects on ROE, indicating that scale advantages and liquidity capacity support equity profitability.

However, the financial leverage ratio (FINLEV) is negative. Its lack of statistical significance suggests that borrowing pressure on equity returns does not follow a consistent pattern across the sector. The real effective exchange rate indicator (REER) was also found to be insignificant, implying that fluctuations in the real exchange rate do not have a notable short-term impact on ROE. Conversely, the service cost index (SSPI), which represents service costs, shows a significant positive effect at the 10% level, indicating that increases in service prices can sometimes move in parallel with income components.

The insignificance of the individual shock indicator (SHOCK) suggests that external crises do not systematically reduce equity profitability. The SHOCK variable employed in this study is constructed as a composite dummy variable that captures heterogeneous events such as pandemics, geopolitical tensions, natural disasters, and political developments. This aggregation inevitably suppresses heterogeneity across shock types and may weaken the variable's statistical power. Accordingly, the lack of statistical significance should be attributed to measurement aggregation rather than to evidence that external shocks are irrelevant. The results suggest that the impact of shocks on firm performance does not operate through a single direct channel but is primarily transmitted through macroeconomic mechanisms such as exchange rate competitiveness and service-sector cost pressures. In this respect, the real effective exchange rate (REER) and the service producer price index (SSPI) provide a more continuous and measurable representation of shock transmission. Overall, the results indicate that ROE is primarily shaped by firm size and liquidity. At the same time, macro shocks have limited and unstable effects.

Table 5. Panel regression results for Return on Equity (ROE).

Row	Estimate	SE	t-Stat	*p*-Value	Significance
(Intercept)	−0.1805	0.0799	−2.2582	0.0242	**
FINLEV	−0.0225	0.0178	−1.2611	0.2076	n.s.
LOGASSET	0.0232	0.0054	4.3283	0.0000	***
QUICK	0.0115	0.0025	4.5503	0.0000	***
REER_CPI	−0.0005	0.0006	−0.7621	0.4462	n.s.
SSPI	0.0000	0.0000	1.8030	0.0718	*
SHOCK	−0.0031	0.0220	−0.1410	0.8879	n.s.

Note: ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. n.s.: Non significant.

Unlike accounting-based indicators, market-based performance reflects investors' forward-looking risk assessments. The panel regression results reveal the behaviour of financial and macroeconomic variables influencing the stock returns (SR) of tourism companies traded on Borsa İstanbul (See Table 6). The results indicate that macroeconomic conditions are more closely associated with market returns than with firm-specific balance-sheet indicators. In particular, the strong and significant negative impact of changes in the real effective exchange rate (REER) on stock returns clearly reflects the exchange rate sensitivity of the tourism sector; appreciation of the real exchange rate reduces competitiveness and thus suppresses stock performance.

Table 6. Regression Analysis for Stock Returns (SR).

Row	Estimate	SE	t-Stat	*p*-Value	Significance
(Intercept)	0.7764	0.1398	5.5525	0.0000	***
FINLEV	0.0074	0.0312	0.2386	0.8115	n.s.
LOGASSET	−0.0135	0.0094	−1.4369	0.1511	n.s.
QUICK	0.0010	0.0044	0.2257	0.8215	n.s.
REER_CPI	−0.0063	0.0011	−5.8334	0.0000	***
SSPI	−0.0001	0.0000	−1.5599	0.1192	n.s.
SHOCK	−0.0117	0.0385	−0.3049	0.7605	n.s.

Note: *** indicate statistical significance at the 1%. n.s.: Non significant.

Conversely, firm variables FINLEV, LOGASSET, and QUICK are not statistically significant, suggesting that short-term stock returns are shaped more by market expectations and macroeconomic conditions rather than balance sheet performance. The insignificance of the service cost index (SSPI) and the composite shock indicator (SHOCK) indicates that external crises and cost pressures do not have a consistent short-term effect on stock returns. Overall, the model demonstrates that the stock performance of tourism companies is more sensitive to macroeconomic volatility than to internal financial structure. Stock returns significantly diverge from accounting-based performance indicators, exhibiting a structure that responds more directly to systemic shocks and exchange rate fluctuations. This situation indicates that macroeconomic uncertainties and risk perceptions more strongly shape market-based performance than internal firm fundamentals do.

Table 7. COVID Threshold Results for ROA (Pre: 2012Q1–2019Q4, Post: 2020Q1–2025Q1).

		Estimate	Std. Error	t-Statistic	*p*-Value	Significance
Pre-Pandemic	const	−0.4234	0.0952	−4.448	0	***
	Regime_LowLEV	−0.1924	0.047	−4.093	0.0001	***
	Regime_HighLEV	−0.231	0.0492	−4.694	0	***
	LOGASSET	0.0253	0.0034	7.372	0	***
	QUICK	0.0054	0.0018	3.009	0.0028	***
	REER_CPI	0.0035	0.0012	2.92	0.0037	***
	SSPI	0.0012	0.0003	3.484	0.0005	***
	SCHOCK	0.0074	0.0121	0.607	0.5443	n.s.
	Threshold_FINLEV	0.6555				
Post-Pandemic	const	0.1521	0.0486	3.129	0.0019	***
	Regime_LowLEV	0.1026	0.023	4.463	0	***
	Regime_HighLEV	0.0496	0.0275	1.805	0.0719	*
	LOGASSET	0.0117	0.0035	3.311	0.001	***
	QUICK	0.0057	0.0013	4.366	0	***
	REER_CPI	−0.0044	0.0008	−5.404	0	***
	SSPI	0	0	−3.066	0.0023	***
	SCHOCK	−0.035	0.02	−1.752	0.0806	*
	Threshold_FINLEV	0.6605				

Notes: *** $p < 0.01$, * $p < 0.10$. n.s. indicates statistically insignificant coefficients.

Firms are classified into low- and high-leverage regimes based on the endogenously estimated financial leverage threshold. Bars report average values of return on assets (ROA), return on equity (ROE), and stock returns (SR) within each regime. The noticeably weaker average accounting-based performance under the high-leverage regime reflects increased financial fragility. At the same time, the stronger reaction of stock returns highlights the market's faster and more pronounced pricing of leverage-related risk. The results presented in Table 7 indicate that the relationship between the active profitability (ROA) of tourism companies and financial leverage has changed before and after the pandemic. During the pre-pandemic period, leverage regimes that affected ROA were more limited and relatively stable. In contrast, in the post-pandemic period, a significant increase in fragility is observed as the transition to high-leverage regimes. The changes in the magnitude and significance of the coefficients, especially in high-leverage regimes,

reveal that borrowing has increased the pressure on firms' active profitability after the pandemic. This finding suggests that the increased uncertainty, demand fluctuations, and tightening of financing conditions following COVID-19 have deepened the financial risk stemming from leverage. Additionally, changes in the coefficients of macro variables such as the real effective exchange rate (REER) and the service sector price index (SSPI) indicate that their effects on ROA are now shaped not only by internal firm dynamics but also by competitiveness and cost pressures.

The findings on return on equity (ROE) in Table 8 reveal that, in the post-pandemic period, the financial leverage structure has evolved into a more fragile profile in terms of equity returns. While the relationship between leverage regimes and ROE was weaker and more heterogeneous before the pandemic, this study provided a comprehensive analysis of how profitability has become more sensitive, especially under high-leverage regimes, after the pandemic. This situation suggests that, following COVID-19, the increased cost of borrowing and heightened volatility in cash flows have made debt financing a riskier structure for equity holders. When evaluated alongside ROA results, it can be said that, in the post-pandemic period, both asset-based and equity-based performance indicators have systematically become more vulnerable due to leverage.

Table 8. COVID Threshold Results for ROE (Pre: 2012Q1–2019Q4, Post: 2020Q1–2025Q1).

		Estimate	Std. Error	t-Statistic	*p*-Value	Significance
Pre-Pandemic	const	−0.7646	0.2176	−3.513	0.0005	***
	Regime_LowLEV	−0.3109	0.1084	−2.868	0.0043	***
	Regime_HighLEV	−0.4537	0.112	−4.052	0.0001	***
	LOGASSET	0.0353	0.0072	4.9	0	***
	QUICK	0.0093	0.004	2.301	0.0219	**
	REER_CPI	0.0068	0.0027	2.496	0.0129	**
	SSPI	0.0019	0.0008	2.379	0.0178	**
	SCHOCK	0.0022	0.0279	0.078	0.938	n.s.
	Threshold_FINLEV	0.7431				
Post-Pandemic	const	0.3911	0.1035	3.78	0.0002	***
	Regime_LowLEV	0.2499	0.0489	5.109	0	***
	Regime_HighLEV	0.1412	0.0584	2.416	0.0162	**
	LOGASSET	0.0163	0.0075	2.156	0.0317	**
	QUICK	0.0091	0.0028	3.256	0.0012	***
	REER_CPI	−0.0113	0.0017	−6.461	0	***
	SSPI	0	0	−0.441	0.6596	n.s.
	SCHOCK	−0.062	0.0425	−1.459	0.1452	n.s.
	Threshold_FINLEV	0.6605				

Notes: *** $p < 0.01$, ** $p < 0.05$. n.s. indicates statistically insignificant coefficients.

The results for stock returns (SR) in Table 9 indicate that financial vulnerability is priced more quickly and more prominently in market-based performance indicators than in accounting-based indicators. During the pre-pandemic period, the sensitivity of stock returns to leverage regimes was limited. In contrast, during the post-pandemic period, especially under high-leverage regimes, market reactions became more intense. This finding suggests that investors have focused more on firms' balance sheet structures since

the pandemic and are pricing in higher risk premiums for high leverage. Additionally, the effects of changes in the REER and SSPI indicators, which reflect cost pressures, on SR reveal that market performance has become extremely sensitive to macroeconomic vulnerabilities. In this regard, Table 9 confirms that after COVID-19, financial vulnerability was primarily reflected through market expectations.

Table 9. COVID Threshold Results for SR (Pre: 2012Q1–2019Q4, Post: 2020Q1–2025Q1).

		Estimate	Std. Error	t-Statistic	*p*-Value	Significance
Pre-Pandemic	const	−0.1814	0.2062	−0.88	0.3795	n.s.
	Regime_LowLEV	−0.1296	0.1047	−1.238	0.2165	n.s.
	Regime_HighLEV	−0.0519	0.1047	−0.495	0.6207	n.s.
	LOGASSET	−0.0138	0.0075	−1.835	0.0672	*
	QUICK	0.0062	0.0042	1.486	0.138	n.s.
	REER_CPI	0.0031	0.0026	1.197	0.2318	n.s.
	SSPI	0.0015	0.0008	2.046	0.0414	**
	SCHOCK	−0.0363	0.0266	−1.362	0.174	n.s.
	Threshold_FINLEV	0.1552				
Post-Pandemic	const	0.8094	0.2889	2.801	0.0053	***
	Regime_LowLEV	0.3294	0.1502	2.193	0.0289	**
	Regime_HighLEV	0.48	0.1515	3.169	0.0016	***
	LOGASSET	−0.0352	0.0209	−1.687	0.0923	*
	QUICK	−0.0011	0.0083	−0.13	0.8968	n.s.
	REER_CPI	−0.0092	0.0051	−1.795	0.0734	*
	SSPI	−0.0001	0.0001	−2.156	0.0317	**
	SCHOCK	−0.0499	0.1251	−0.399	0.6902	n.s.
	Threshold_FINLEV	0.1182				

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. n.s. indicates statistically insignificant coefficients.

When evaluating Tables 7–9 together, it is clearly seen that COVID-19 has quantitatively altered the relationship between financial leverage and performance in the tourism sector. The leverage–performance relationship, which was relatively manageable before the pandemic, has become more fragile and regime-sensitive in both accounting- and market-based indicators since then. These results indicate that financial fragility has transitioned from a temporary shock caused by the pandemic to a structural characteristic. Table 10 provides a comprehensive summary of the empirical testing results for the initial research hypotheses. An overall assessment of the hypothesis-testing results indicates that H1, which posits a nonlinear relationship between financial leverage and firm performance, is partially supported, particularly when the threshold regression results are considered. The magnitude and direction of the leverage–performance relationship vary across performance measures and leverage regimes. H2, which suggests that financial fragility intensified in the post-COVID period, is supported, with the effects more pronounced under high-leverage regimes. With respect to H3, market-based performance indicators (stock returns) respond more rapidly and more strongly to leverage-related fragility than accounting-based indicators, providing strong support for this hypothesis. Finally, H4 is conditionally supported, as the effects of macroeconomic variables—especially exchange rate competitiveness and service-sector cost pressures—intensify primarily under high-leverage regimes.

Table 10. Summary of Hypothesis Testing Results.

Hypothesis	Expected Effect	Empirical Findings and Analysis	Status
H1: Financial leverage exhibited a positive and statistically significant effect on ROA, while its effects on ROE and stock returns were heterogeneous and largely insignificant, indicating that leverage–performance dynamics differ across performance measures.	Positive (+)	Leverage showed a positive and significant effect on ROA (0.0156, $p < 0.05$), suggesting defensive borrowing or scale advantages.	Partially supported
H2: External shocks deepen performance declines via competitiveness and cost pressures.	Negative (−)	Significant negative impact of REER (−0.0031, $p < 0.01$) on ROA confirms vulnerability through the competitiveness channel.	Supported
H3: Market-based performance (SR) is highly sensitive to macroeconomic and risk premiums.	High Sensitivity	Stock Returns (SR) responded strongly to REER and period-specific common effects rather than internal firm metrics.	Strongly supported
H4: The COVID-19 pandemic induced a structural shift in the leverage–performance relationship.	Structural Break	Post-pandemic analysis (Tables 7–9) confirms significant regime-sensitivity and increased fragility in high-leverage regimes.	Supported

5. Discussion

The primary aim of this study is to reveal whether the relationship between financial leverage and firm performance in the tourism sector is linear and how this relationship has changed in the post-COVID-19 period. The findings clearly and consistently answer the research question; they show that borrowing turns into financial vulnerability beyond certain thresholds. Specifically, it has been determined that when the financial leverage ratio exceeds approximately 60–70%, a significant regime change in firm performance occurs. This evidence clearly indicates that the leverage–performance relationship in the tourism sector is nonlinear and exhibits a threshold-based structure. Additionally, in the post-COVID-19 period, these thresholds have become more binding, and firms under high leverage regimes tend to become more vulnerable both in accounting-based and market-based performance indicators.

These results indicate that borrowing in the tourism sector is not always a supportive financial tool for performance. Especially during periods of multiple macroeconomic shocks, leverage can deepen vulnerability by reducing firms' financial flexibility. However, the fact that some companies with high leverage ratios experience limited performance losses suggests that alternative explanations should also be considered. This situation points to factors such as heterogeneity among firms, liquidity management capacity, cost structures, the quality of corporate governance, and strategic decisions made during crisis periods, which can mitigate the impact of leverage. Therefore, the transformation of borrowing into financial vulnerability depends not only on the debt ratio but also on the corporate and operational capacity under which this debt is carried.

The findings of the study offer important insights both theoretically and practically. The findings of this study may initially be perceived intuitively; however, the main contribution is demonstrating empirically when, at what leverage level, and through which performance channel these intuitions are valid. Unlike previous studies that assume a linear relationship between leverage and performance, this research reveals that the leverage effect shifts regimes endogenously through thresholds. The results show that borrowing can move in harmony with firm performance up to a certain point, but once this threshold is exceeded, financial fragility rapidly deepens. Additionally, the originality of the study lies in simultaneously showing that the same leverage regime has different speeds and intensities of impact on accounting-based performance indicators (ROA, ROE) and market-based indicators (stock returns). The findings indicate that financial fragility manifests with a delay in accounting indicators, whereas market-based indicators price in risks earlier. This divergence suggests that financial fragility should be viewed not only as 'low performance' but as a dynamic process dependent on the performance measurement channel. Finally, considering the post-COVID period as a separate regime demonstrates that the observed thresholds are not specific to temporary shocks; instead, the leverage–fragility relationship has been structurally reshaped in the post-crisis period. In this respect, the study not only reiterates that 'high debt is risky' but also clearly shows under which conditions debt transforms into a persistent source of fragility. From a theoretical perspective, the results question the frequently assumed linear leverage–performance relationship in the capital structure literature and reveal that threshold-based, regime-dependent approaches are more explanatory for the tourism sector. In this context, it is observed that the Pecking Order and Trade-off approaches are not mutually exclusive theories but complementary frameworks that operate through different performance channels. In practice, it becomes critical for firm managers to consider sustainable leverage thresholds when making borrowing decisions. For policymakers, it is important to evaluate leverage ratios as early warning indicators in macroprudential regulations targeting the tourism sector. For investors, especially in the post-crisis period, it is understood that the risk premiums of highly leveraged tourism firms should be priced more cautiously.

This study makes three main contributions to the relationship between financial leverage and firm performance in the tourism sector. First, by advancing the literature's view that the leverage–performance relationship is nonlinear, it empirically demonstrates, using an endogenous-threshold regression approach, that borrowing beyond certain thresholds translates into financial vulnerability. In this regard, the study shows that the capital structure in the tourism sector is not a static matter of ratios but a regime-dependent and threshold-based process. Second, treating the post-COVID-19 period as a separate regime reveals how a global crisis permanently reshapes the leverage–vulnerability mechanism and demonstrates that financial vulnerability has become a structural characteristic rather than a temporary shock. Third, by evaluating accounting-based and market-based performance indicators within the same framework, it comprehensively analyses how financial vulnerability differs through internal channels (profitability and liquidity) and external channels (risk premium, exchange rate, and cost pressures). In this context, the study more clearly defines the limits of debt-based growth strategies in the tourism sector and provides an empirical reference point for threshold-based early warning mechanisms.

However, the study has some limitations. As with most firm-level capital-structure studies, the possibility of endogeneity between financial leverage and firm performance cannot be entirely ruled out. One of the important limitations of this study is that the relationship between financial leverage and firm performance is potentially bidirectional. Although the panel data structure used, along with firm-specific random effects and period fixed effects, partially controls for heterogeneity, the endogeneity problem related to

causality cannot be eliminated methodologically. Therefore, the coefficients reported in the study should be interpreted as observed relationships under certain conditions, rather than causal effects.

Nevertheless, the use of quarterly panel data, firm-level random effects, period fixed effects, and an endogenous-threshold regression framework helps mitigate concerns about unobserved heterogeneity and reverse causality, although future research employing instrumental variables or dynamic panel techniques could further strengthen causal inference.

First, the analysis is limited to tourism companies listed on Borsa Istanbul, which restricts the generalisability of the results to all tourism businesses. Second, some structural elements, such as financial flexibility, digital capacity, and the quality of corporate governance, cannot be measured directly and are instead inferred from indirect indicators. Additionally, the set of macroeconomic variables used largely reflects sectoral dynamics but may not encompass all external shock channels. There are significant differences among tourism companies in terms of asset concentration, fixed cost ratio, and revenue structure. In this study, due to the limited sample size, separate analyses could not be conducted based on sub-sectors. This situation should be considered a limitation, as it may not fully capture the sector's heterogeneity.

These limitations also present new directions and questions for future research. Further studies could incorporate variables such as firm-level digitalisation indicators, ESG scores, or governance structures into the model to examine the leverage–vulnerability relationship in more detail. Additionally, it could be investigated whether leverage thresholds differ across sub-sectors of the tourism industry (such as hospitality, transportation, food and beverage). Finally, applying similar threshold analyses across different countries and crisis types could provide more comprehensive answers to whether financial vulnerability is universal or context-dependent.

6. Conclusions

This study provides strong evidence that the relationship between financial leverage and firm performance in the tourism sector is nonlinear, and that beyond certain thresholds, borrowing becomes a source of financial vulnerability. The findings clearly answer the research question by showing that when financial leverage ratios exceed approximately 60–70%, a significant regime change in firm performance occurs. Especially in the post-COVID-19 period, this relationship has become more sensitive and fragile; high leverage levels are associated with more negative effects on both accounting-based and market-based performance indicators. These results indicate that borrowing is not always a tool that supports growth in the tourism sector; instead, it can become a structural risk factor during periods of crisis. This study moves beyond simplistic interpretations, suggesting that borrowing uniformly weakens firm performance in the tourism sector. The findings indicate that the leverage–performance relationship varies depending on leverage levels and crisis regimes, and that financial fragility deepens rapidly once specific thresholds are crossed. Accordingly, the contribution of this research lies not merely in documenting performance declines during crises, but in identifying the leverage levels at which financial vulnerability becomes structural rather than temporary. The study shows that financial fragility is not only a result of temporary shocks but also has a structural characteristic that is sensitive to thresholds and crisis regimes. In this context, decisions regarding the capital structure in the tourism sector should be evaluated not on static ratios but considering macroeconomic conditions and crisis dynamics. The sustainability of borrowing depends not only on the size of the debt but also on the economic environment in which it is carried and the institutional capacity under which it is managed.

From an application perspective, it is important for company managers to monitor leverage thresholds when making borrowing decisions and to prioritise strategies that maintain financial flexibility. For policymakers, it is necessary to consider leverage ratios as early warning indicators in regulations targeting the tourism sector and to develop measures that will enhance the sector's financial resilience during crisis periods. For investors, especially in the post-crisis period, it is understood that the risk profiles of highly leveraged tourism companies should be evaluated more cautiously. In this context, the findings should be considered as relational evidence showing under what conditions financial vulnerability concentrates, rather than as direct causal results in terms of policy or management recommendations.

As a result, this study reveals when and under what conditions borrowing in the tourism sector becomes dangerous, contributing to a better understanding of financial vulnerability. The findings indicate that capital structure decisions should be reconsidered during crises and provide a guiding framework for developing more sustainable, cautious, and resilient financial strategies in the tourism industry.

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