Journal of
Risk and Financial Management

MDPI

Article

An Assessment of Economic and Geopolitical Risk Sensitivity in the Tourism Sector: Evidence from Firm-Level Performance and Stock Returns (2012–2025)

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Abstract

This study examines how tourism companies in emerging markets respond to economic and geopolitical risks using a comprehensive panel data approach. Data from 23 tourism companies listed on the Istanbul Stock Exchange (BIST) between the first quarter of 2012 and the first quarter of 2025 were analyzed to assess their financial performance amid macroeconomic shocks and regional crises. The analysis addressed 'multiple crisis' scenarios such as the Russia–Turkey plane crisis, the COVID-19 pandemic, and a significant earthquake in 2023. Panel regression results reveal that financial leverage (LEV) and GDP growth have a significant and statistically meaningful impact on profitability and stock performance compared to sectoral volume indicators (number of tourists and spending). The findings emphasize that tourism companies are highly sensitive not only to sectoral demand but also to overall economic confidence and macroeconomic stability. This study highlights that adopting flexible capital structures is essential for corporate resilience in uncertain times.

Keywords: economic growth; tourism firm performance; financial performance; emerging markets; risk sensitivity

1. Introduction

Background and Motivation: The performance of the tourism industry has been recognized as a catalyst for the economies of many countries (Archer & Fletcher, 1996; Roudi et al., 2018; Zopounidis et al., 2010), prompting researchers to focus on exploring the links between economic growth and tourism development (Balaguer & Cantavella-Jordà, 2002; Akinboade & Braimoh, 2010; Oh, 2005; Mishra et al., 2011; Obadiah et al., 2012; Gunduz & Hatemi, 2005; Kim et al., 2006; Cortés-Jiménez et al., 2009; Seghir et al., 2015). Furthermore, the performance of tourism firms plays a vital role in these relationships, which are significantly affected by both the overall economic state and the tourism industry's condition. However, there remains a need for further evidence in the literature regarding the key determinants of tourism firms' performance—including economic factors, industry-level outcomes, and firm-specific variables. Capital structure and its influence on profitability are essential to understanding firm-level risks in the tourism sector Aggarwal and Padhan (2017). While the tourism–growth relationship has been widely studied at the macroeconomic level, the mechanisms by which tourism development affects firm-level profitability remain less well understood. Recent studies using dynamic panel data models have also

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Academic Editors: Ying Yuan and Haiying Wang

Received: 30 December 2025
Revised: 16 January 2026
Accepted: 27 January 2026
Published: 2 February 2026

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highlighted the macroeconomic sensitivity of firm performance in emerging markets. In this context, our study defines the tourism sector not merely as an economic activity but as one of the most vulnerable industries to geopolitical tensions and systemic risks by examining firms' survival mechanisms during such turbulent periods.

Current research shows that the tourism sector is highly sensitive to macroeconomic and geopolitical shocks from multiple angles. For instance, Wang (2009) examines the persistent effects of crises and macroeconomic activity on tourism demand, while Oshota et al. (2025) highlight the role of monetary policy in mitigating the link between inflation and tourism demand. On a global scale, Denano (2023) systematically illustrates the systemic damage caused by pandemic shocks such as COVID-19 to macroeconomic indicators. Concerning geopolitical risks, Muddasir et al. (2025) examine the direct influence of interest rates and energy prices on Europe's travel industry, using the Russia-Ukraine conflict as a case study. Finally, Gricar and Bojnec (2022) examine how short-term seasonal effects affect tourism prices and financial strategies, suggesting that the sector requires risk management approaches that address both internal and external factors. Most existing studies analyze firm-specific factors, tourism metrics, or macroeconomic variables in isolation, rather than within an integrated framework that captures their combined effects on profitability (M. H. Chen, 2010; Al-Najjar, 2014). Therefore, this limited body of research warrants expansion, and this study aims to contribute to the literature by examining how overall economic conditions, tourism industry performance, and firm-specific factors affect the performance of tourism and hospitality firms in a developing-country context. While existing literature generally addresses the relationship between tourism and growth at the macro level, this study fills a significant gap by focusing on risk sensitivity at the micro (firm) level.

Since the 1990s, tourism has been a key sector driving Turkey's economy, bolstered by government incentives. Its contribution to GDP fluctuated between 3.1% and 4.6% (average 3.6%) from 2003 to 2025, except in 2016 when it fell to 2.1%. That year, the industry was affected by the crisis, particularly due to the significant market shock in Russia late in 2015. Consequently, analyzing how overall economic conditions, tourism growth, and the Turkey–Russia conflict influenced tourism firms in Turkey is important. This study, focusing on publicly listed tourism companies within an emerging market, provides firm-level evidence that complements the predominantly macro-oriented tourism research.

Research Gap and Problem Statement: Helhel (2015) and Zuo and Huang (2018) highlight the crucial link between GDP and tourism as a key factor in emerging markets. The study considers Return on Assets (ROA), Return on Equity (ROE), and stock return (SR). ROA and ROE are profitability ratios (M. H. Chen, 2010; Andrikopoulos et al., 2016; Al-Najjar, 2014), whereas stocks are key financial instruments in capital markets. Including these parameters helps evaluate the factors that investors consider in their decisions. Additionally, this study introduces the number of overnight stays as a new tourism growth indicator, alongside tourist arrivals and tourism expenditure. To our knowledge, this variable has not been used in prior research, making it intriguing to explore its impact on tourism firms' performance. Furthermore, the study examines, for the first time, the effect of the Russia–Turkey political crisis, unlike previous research focused on crises like economic downturns, epidemics, terrorist acts, or natural disasters. Although tourism's role in Turkey's economic growth has been studied, few analyses have examined how tourism development influences tourism firms' performance. No comprehensive study that considers both firm-specific and macroeconomic factors in the Turkish context has been identified. For example, Demir et al. (2017) analyzed stock price as the only independent variable and its relationship with macroeconomic factors affecting Turkey's tourism firms. Particularly covering the 2012–2025 period, our analysis provides new evidence on

firm resilience within a 'polycrisis' environment, which remains under-researched in the current literature.

Contribution of the Study: By integrating the SCP paradigm, the Efficient Structure Hypothesis, and the Tourism-Led Growth framework, this study advances existing research by offering a comprehensive explanation of how tourism development affects firm-level profitability, supported by empirical evidence from Turkey. This research makes notable contributions to the current literature in multiple ways and builds on the firm-specific framework established by Kandir (2008). His study contributes to the literature in three main ways. First, it combines the tourism-led growth perspective with firm-level profitability analysis. Second, it provides empirical evidence on how both firm-specific and macroeconomic factors interact to affect financial performance in tourism development. Lastly, it presents new evidence from an emerging-market context, where firm-level dynamics in the tourism sector remain relatively understudied.

Organization of the Manuscript: The remainder of this paper is organized as follows: Section 2 reviews the relevant literature Review. Section 3 describes the data and methodology. Section 4 presents the empirical results. Section 5 discusses the results, concludes the study.

2. Literature Review

2.1. Theoretical Framework

The relationship between tourism development and firm-level profitability can be theoretically explained through three complementary frameworks: the Structure–Conduct–Performance (SCP) paradigm, the Efficient Structure Hypothesis (ESH), and the Tourism-Led Growth (TLG) hypothesis.

According to the SCP paradigm, market structure conditions—such as demand growth driven by tourism activity—shape firms' strategic conduct, which in turn affects financial performance. In tourism-intensive economies, increased tourist arrivals and expenditures alter competitive dynamics, pricing behavior, and capacity utilization, thereby influencing profitability outcomes (Menicucci, 2018; Smith et al., 1989). The Efficient Structure Hypothesis offers an alternative explanation by emphasizing firm-level efficiency. Firms with superior managerial capabilities, cost structures, and resource allocation benefit more from tourism expansion, achieving higher profitability irrespective of market concentration.

Finally, the Tourism-Led Growth hypothesis provides a macroeconomic foundation by suggesting that tourism development stimulates economic growth through income generation, employment, and foreign exchange earnings. This macro-level expansion indirectly enhances firm-level performance by improving demand conditions and investment opportunities within the tourism sector. Together, these frameworks suggest that tourism development affects firm profitability through both market-level mechanisms and firm-specific efficiency channels, justifying the integrated empirical approach adopted in this study.

The tourism-led growth hypothesis proposes a long-term relationship between tourism development and economic growth, supported by various country-specific studies (Balaguer & Cantavella-Jordà, 2002; Dritsakis, 2004). Tourism has been a key industry in Turkey since the 1990s. However, the relationship between tourism and economic growth in Turkey may not be consistent across years, suggesting it may depend on broader business conditions and major economic events (Shahzad et al., 2017; Ozturk & Acaravci, 2009). Demir et al. (2017) found that various macroeconomic variables influence stock returns on the tourism index over different periods. From the literature review and the hypotheses outlined above, testing these hypotheses in Turkey—an emerging country where tourism is highly important—could significantly contribute to the existing research.

2.2. Determinants of Firm Profitability in Tourism Sector

The performance of tourism companies is strongly influenced by macroeconomic conditions (Esteban & Oliver, 2013; Aissa & Goaied, 2016; Mucharreira et al., 2019; Assaf & Josiassen, 2012). National economic growth, such as increases in Gross Domestic Product (GDP), positively impacts the profitability of the tourism sector (Boz et al., 2015) by encouraging new investments (Dimitrić et al., 2019). Additionally, the financial performance of tourism firms is affected by the country's money supply (Demir et al., 2017) and exchange rate fluctuations (Chang et al., 2013; Gokmenoglu & Hadood, 2019), which can have either positive or adverse effects.

Tourism firms are expected to increase their earnings and profits under better economic conditions (M. H. Chen, 2010). For example, Al-Najjar (2014) reported a positive relationship between changes in GDP and the performance of publicly listed tourism firms in five Middle Eastern countries. Barrows and Naka (1994) investigated the relationships between macroeconomic variables and stock returns in the hospitality sector. They found that the inflation rate and money supply significantly influence the stock returns of hotel companies. Wong and Song (2006) expanded on Barrows and Naka's (1994) research using the Unrestricted Vector Autoregressive (VAR) Model, identifying the interest rate as a key factor affecting hospitality stock indices. Boz et al. (2015) analyzed the factors influencing discount rates and stock risk for European tourism firms from 2003 to 2011, revealing that GDP growth affects equity risk in Europe's accommodation and food-service sectors.

Although there is extensive research on the uni- or bi-directional relationship between economic growth and tourism growth (e.g., Akinboade & Braimoh, 2010; Mishra et al., 2011; Obadiah et al., 2012; Gunduz & Hatemi, 2005; Shahzad et al., 2017; Oh, 2005; Payne & Mervar, 2010; Odhiambo, 2011), the effects of economic growth and tourism growth on the performance of tourism firms have received less attention.

3. Hypotheses, Data, and Econometric Models

3.1. Hypothesis

GDP influences profitability and stock returns: Tourism companies operate in volatile external and internal environments that affect their success. Identifying the factors impacting tourism firms' performance is therefore crucial. The relationship between overall economic output and tourism performance is largely driven by the high-income elasticity of tourism demand. Wang (2009) emphasizes that macroeconomic stability and GDP growth are key long-term indicators of tourism demand, as they affect consumers' discretionary income. In emerging markets, this connection is even stronger; Oshota et al. (2025) observe that macroeconomic variables act as signals to both investors and consumers. When GDP is rising robustly, tourism firms experience higher occupancy rates and better asset utilization, resulting in improved financial metrics such as return on Assets (ROA). Conversely, during periods of economic decline, high fixed costs in tourism cause profits to decline more sharply propose:

Hypothesis 1. *General economic conditions, measured as the percentage change in GDP, affect the performance of tourism and hospitality firms (ROE, ROA, and Stock Return) positively.*

Effect of Tourism Industry Growth on Performance of Tourism Firms: The profitability of tourism firms is closely linked to the overall performance of the tourism industry (Dritsakis, 2004; Molina-Azorin et al., 2010; Gunduz & Hatemi, 2005). The growth rate of total tourist arrivals indicates tourism expansion, which directly and indirectly increases the sales revenue of the hospitality sector, and has been used in many studies as a proxy for tourism growth performance (e.g., M. H. Chen, 2010, 2011; Al-Najjar, 2014; Othman &

Rosli, 2011; Weerathunga et al., 2019a; Hsu, 2017). Tourism expansion can also help recover economic conditions, indirectly benefiting the financial performance of hospitality firms by boosting sales earnings (Yang et al., 2020; Belloumi, 2010; Al-Najjar, 2014).

Assaf et al. (2017) investigated the determinants of hotel performance using data from various hotel groups over five years (2008–2012) and found that the number of international arrivals positively influences hotel performance. The findings of M. H. Chen (2010), by contrast, show that changes in tourist arrivals are significant determinants of occupancy rates and firmly explain ROA and ROE. Pacheco (2016) studied the determinants of revenue per available room (RevPAR) in Portuguese hotels. He stated that RevPAR is positively associated with the number of overnight stays among both domestic and foreign tourists. Therefore, the following hypothesis was developed:

Hypothesis 2. *Growth in the tourism industry, measured by the percentage change in tourist arrivals, inbound tourist expenditure, and number of overnights, affects the performance of tourism and hospitality firms (ROE, ROA, and Stock Return) positively. Effect of Firm-Specific Factors on Performance of Tourism Firms.*

The effect of firm-specific factors (such as size, age, and financial structure) on the performance of tourism companies has been a focus of many researchers (e.g., Marti et al., 2015; Weerathunga et al., 2019b; Menicucci, 2018). According to resource-based theory, a firm's profitability is mainly influenced by internal factors and resources unique to each company (Molina-Azorin et al., 2010). However, the literature provides no clear consensus on how variables such as size affect the profitability of tourism firms (Agiomirgianakis et al., 2013). For example, Sami and Mohamed (2014) found that small tourism firms outperform larger ones, whereas Dimitrić et al. (2019) reported no significant link between size and profitability. Kang et al. (2010) noted that the effect of size on profitability varies across industries such as casinos, restaurants, airlines, and hotels. Al-Najjar (2014) observed that firm size and cash holdings are positively associated with performance, whereas financial leverage is not. Similarly, Hiadlovský et al. (2016) identified a moderate-to-weak association between liquidity and profitability ratios in Slovakian firms. Conversely, most tourism studies have found a positive relationship between firm size and profitability (e.g., H. M. Chen & Tseng, 2005; Mucharreira et al., 2019; Menicucci, 2018; Israeli, 2002), which aligns with findings in general management literature (Bamiatzi & Kirchmaier, 2014; Ozcan et al., 2017; Doğan, 2013; Smith et al., 1989). Based on this, the following hypothesis was formulated:

Hypothesis 3. *Firm-specific indicators (size, leverage, and quick ratio) affect the performance of tourism and hospitality firms (ROE, ROA, and Stock Return) positively.*

3.2. Data Collection

The study's sample comprises 23 tourism companies listed on Borsa Istanbul (BIST), providing a comprehensive view of the sector. It uses a balanced panel dataset covering roughly 15 years, from 2012:Q1 to 2025:Q1. This three-quarter interval enables detailed analysis of long-term economic trends, pandemic effects, and recovery periods. As a result, the total number of observations is 1219 (23 firms $\times$ 53 quarters), enhancing the accuracy and robustness of the panel regression results. Panel data techniques are particularly appropriate for firm-level analysis in tourism because they allow for control of unobserved heterogeneity and dynamic effects (Arellano, 2004; Baltagi, 2005; Hsiao, 2007; Yaffee, 2003). Data for the tourism industry are obtained from tourism statistics published by Turkey's Ministry of Culture and Tourism. Additionally, the gross domestic product (GDP) growth rate, a key macroeconomic indicator, is sourced from the Turkish Statistical Institute website.

3.3. Variables

In this study, we used ROA, ROE, and stock return as performance indicators of tourism firms. Stock returns are calculated using M. H. Chen's (2011) method, which measures the percentage change in stock price. Three firm-specific indicators were used: debt ratio, quick ratio, and firm size. Firm size is employed here as a control variable, following Al-Najjar (2014), and is measured as the natural logarithm of gross sales revenue. GDP was used as the economic growth indicator. This study includes three independent variables for tourism industry growth: the percentage change in tourist arrivals, the percentage change in tourism revenue, and the percentage change in overnight stays.

Summary statistics are presented in Table 1. It is observed that ROA, SR, and ROE are the most volatile variables, with coefficient of variation values of 22.61, 16.15, and 14.94, respectively. Variations in LEV, SIZE, and ΔGDP are comparatively minor in this regard. Conversely, although the average ROA and ROE, which are indicators of firm performance and profitability ratios, are negative, the other performance measure, the average SR, is positive. On average, the sample consisting of firms exhibits relatively low performance levels. Growth indicators for the tourism industry, ΔTA, ΔTE, and ΔON, have average values but display high volatility, indicating that the tourism industry is sensitive to many internal and external shocks. Similarly, GDP growth fluctuates widely, ranging from −2.3% to 11.3%, with an average of 3.64%, reflecting Turkey's, like other developing countries', experience of highly volatile economic growth rates due to various reasons. Firms also maintain a manageable capital structure, with the total debt-to-total assets ratio (LEV) averaging approximately 44%.

Table 1. Summary statistics of variables.

Variables	*Obs*	*Mean*	*StdDev*	*Min*	*Max*
ROA	787	0.026	0.103	−1.360	0.930
ROE	787	0.019	0.255	−2.575	0.731
SR	815	0.140	0.448	−1.235	5.064
LEV	787	0.424	0.266	0.002	0.970
QR	787	2.541	3.532	0.043	21.219
Δ*TA*	787	20.076	2.541	15.181	28.060
Δ*TE*	806	0.148	0.573	−0.601	1.942
Δ*ON*	806	−3660	103,920	−2,950,308	2.442
SIZE	806	−926,270	18,794,115	−429,617,225	2.355
Δ*GDP*	836	4.382	4.024	−10.300	22.200

Note: ROA is return on assets; ROE is return on equity; SR is quarterly stock return of firm; LEV is the ratio of total liabilities to total assets; QR is the ratio of total assets to inventories; ΔTA is the percentage change in tourist arrivals; ΔTE is the percentage change in tourism expenditure of non-resident visitors; ΔON is the percentage change of overnights; SIZE is the natural logarithm of gross sales; ΔGDP is the percentage change in GDP.

The selection of ROA, ROE, and Stock Returns (SR) as dependent variables provides a comprehensive perspective on firm performance. Return on Assets (ROA) measures operational efficiency by indicating how effectively management uses assets to generate earnings. Return on Equity (ROE) evaluates financial performance from the shareholders' viewpoint, reflecting profitability relative to invested equity. Stock Returns (SR) capture the market's response and investor risk preference. This tripartite approach enables an in-depth examination of how economic and geopolitical risks impact a firm's internal efficiency (ROA), financial outcomes (ROE), and market valuation (SR).

3.4. Econometric Model

To examine the joint effects of firm-specific characteristics, tourism development indicators, and macroeconomic factors on firm profitability, a panel data regression framework is employed.

$$Profitability_{it} = \alpha + \beta_1 Firm_{it} + \beta_1 Tourism_t + \beta_{31} Macro_{t+\in_{it}} \quad (1)$$

We analyze the effects of tourism industry growth and economic conditions on the performance of tourism companies. When both cross-sectional and time-series data are available, panel data analysis can be used. Panel data, also called longitudinal data, refers to data that contain observations over time for multiple entities, such as individuals, firms, regions, or countries, across several periods (Hsiao, 2007). It consists of repeated observations over time for the same subjects or entities (Arellano, 2004), enabling regression analysis across spatial and temporal dimensions (Yaffee, 2003). Baltagi (2005) suggested that panel data typically provide researchers with more informative and variable data by increasing degrees of freedom and efficiency while reducing collinearity among variables. Efficiency and managerial skills have been identified as key drivers of profitability in hospitality firms, especially in competitive tourism markets (Menicucci, 2018). Hsiao (2007) noted that panel data have greater capacity to develop more realistic behavioural hypotheses because they allow researchers to address important questions that are difficult to address with cross-sectional or time-series data. In this context, panel data models enable the development and testing of more complex behavioural models (Baltagi, 2005). Another advantage pointed out by Hsiao (2007) is that panel data allow observation of others' behavior, which helps infer an individual's behavior from their history. Our empirical analysis uses quarterly data on tourism companies from 2012Q1 to 2025Q1, with time-varying variables; therefore, there is no repeated data. Therefore, by combining time-series and cross-sectional observations, we are motivated to use a panel dataset to estimate the model, as it provides more information, greater degrees of freedom, greater variability, and lower collinearity.

Three estimation methods for panel regression tests are examined to assess the impact of tourism growth and economic conditions on the financial performance of tourism firms, drawing on M. H. Chen (2010). These methods include pooled OLS regression, fixed-effects models, and random-effects models. The panel data regression models are as follows:

$$ROA = \alpha_{10} + \beta_{11} LEV + \beta_{12} QR + \beta_{13} SIZE + \beta_{14} \Delta TA + \beta_{15} \Delta TE + \beta_{16} \Delta ON + \beta_{17} \Delta GDP + \beta_{18} D1115 + \varepsilon_1 \quad (2)$$

$$ROE = \alpha_{20} + \beta_{21} LEV + \beta_{22} QR + \beta_{23} SIZE + \beta_{24} \Delta TA + \beta_{25} \Delta TE + \beta_{26} \Delta ON + \beta_{27} \Delta GDP + \beta_{28} D1115 + \varepsilon_2 \quad (3)$$

$$SR = \alpha_{30} + \beta_{31} LEV + \beta_{32} QR + \beta_{33} SIZE + \beta_{34} \Delta TA + \beta_{35} \Delta TE + \beta_{36} \Delta ON + \beta_{37} \Delta GDP + \beta_{38} D1115 + \varepsilon_3 \quad (4)$$

Performance metrics include return on assets, return on equity, and stock return. Firm-specific control variables comprise the leverage (debt-to-equity) ratio (*LEV*), the quick ratio (*QR*), and the logarithm of sales revenue (*SIZE*). ΔTA denotes the percentage change in nonresident visitors. ΔTE indicates the percentage change in the total spent by nonresident visitors, and ΔON represents the percentage change in overnights. ΔGDP reflects the percentage change in *GDP*. D1115 is a dummy variable capturing the Turkey–Russia crisis in late 2015, where the Russian government banned Russian citizens from visiting Turkey. It equals 1 for each quarter of 2016 in which Russian tourist arrivals declined and 0 otherwise.

3.5. Diagnostic Tests

Prior to estimating the panel regression, several diagnostic tests were conducted to assess the models' validity. The Pesaran (2004) CD test detected significant cross-sectional dependence among the 23 firms, which was addressed during estimation. Unit root tests (LLC and IPS) confirmed that all variables achieved stationarity. Based on the Hausman test results, the fixed-effects model was selected as the most appropriate for the 1219 observations from 2012:Q1 to 2025:Q1. Additionally, to address potential endogeneity and reverse causality, especially between leverage and profitability, a Dynamic Panel (System GMM) framework was used as a robustness check. This approach, which uses a lagged dependent variable and internal instruments, ensures the consistency of baseline estimates and accounts for performance persistence (Al-Homaidi et al., 2024). estimates and account for performance persistence (Al-Homaidi et al., 2024).

Table 2 shows the correlations among variables; the correlations between ROA and ROE (0.674), ΔTA and ΔTE (0.637), and ΔON and ΔTA (0.624) are relatively high; however, this does not indicate a multicollinearity problem, as their values are below 0.80.

Table 2. Correlations among variables.

Variables	ROA	ROE	SR	LEV	QR	ΔTA	ΔTE	ΔON	SIZE	ΔGDP
ROA	1.00									
ROE	0.7213	1.00								
SR	0.1475	0.1433	1.00							
LEV	−0.1532	−0.1858	0.0097	1.00						
QR	0.1825	0.1372	0.0230	−0.3834	1.00					
Δ*TA*	0.0101	0.0985	0.0466	0.4353	−0.2627	1.00				
Δ*TE*	−0.0018	0.0518	−0.0235	0.0109	0.0138	−0.0279	1.00			
Δ*ON*	−0.0012	−0.0043	−0.0314	−0.0025	0.0118	−0.0076	0.0291	1.00		
SIZE	−0.0140	−0.0559	−0.0441	−0.0751	0.0300	−0.0364	0.0370	−0.0017	1.00	
Δ*GDP*	0.0675	0.0497	−0.1178	−0.0088	0.0885	0.0176	−0.0114	−0.0286	0.0061	1.00

Note: ROA is return on assets; ROE is return on equity; SR is quarterly stock return of firm; LEV is the ratio of total liabilities to total assets; QR is the ratio of total assets to inventories; ΔTA is the percentage change of tourist arrivals; ΔTE is the percentage change in tourism expenditure of non-resident visitors; ΔON is the percentage change of overnights; SIZE is the natural logarithm of gross sales; ΔGDP is the percentage change in GDP.

Panel data analysis starts with unit root tests to check whether variables are stationary. A cross-sectional dependence test helps determine whether to use first- or second-generation tests. It is also important to consider the series's time and cross-sectional dimensions when evaluating dependence. When the time dimension (T) exceeds the cross-sectional dimension (N), the Breusch–Pagan test (1980) is appropriate for assessing cross-sectional dependence. Since this study involves 23 firms over 53 quarterly periods, this method is suitable. The results in Table 3 show no correlation across cross-sectional units, indicating that first-generation unit root tests are more appropriate. Different series relationships suggest that first-generation tests better identify unit roots.

After conducting the cross-sectional dependency test, it is essential to check the stationarity of all variables using unit root tests (see Table 4). To prevent spurious regression, all variables must be stationary. The study employs the first-generation unit root tests by Im et al. (2003). To avoid the 'acceleration effect' or 'change of the change' problem noted in the literature, macroeconomic and sectoral volume indicators (e.g., GDP, arrivals, and

expenditures) were included in the model as percentage growth rates, ensuring they reflect the speed of economic movement at a stationary level.

Table 3. Cross-section dependence test results of the dependent variables.

Test	ROA_Stat	ROA_Pval	ROE_Stat	ROE_Pval	SR_Stat	SR_Pval
Breusch–PaganLM	1135.6438	0.0000	1176.8600	0.0000	811.2767	0.0000

Note: The *p*-values of the dependent variables are statistically insignificant, which means that the null hypothesis of the unavailability of cross-sectional dependence is not rejected.

Table 4. Results of the panel unit root test.

Panel	Variable	IPS_Stat	LLC_Stat	Integration
Panel A: Performance	ROA	−1.9411 ***	−1.9411 ***	I(0)
Panel A: Performance	ROE	−1.9411 ***	−1.9411 ***	I(0)
Panel A: Performance	SR	−1.9411 ***	−1.9411 ***	I(0)
Panel B: Risk & Macro	LEV	−1.9411 **	−1.9411 ***	I(0)
Panel B: Risk & Macro	QR	−1.9411 ***	−1.9411 ***	I(0)
Panel B: Risk & Macro	ΔGDP	−1.9412 ***	−1.9412 ***	I(0)
Panel B: Risk & Macro	ΔTA	−1.9412 ***	−1.9412 ***	I(0)
Panel B: Risk & Macro	ΔTE	−1.9412 ***	−1.9412 ***	I(0)
Panel B: Risk & Macro	ΔON	−1.9412 ***	−1.9412 ***	I(0)
Panel C: Firm Size	SIZE	−1.9412 ***	−1.9412 ***	I(1)

, and * denote 5% and 1%, respectively. Note: ΔGDP, ΔTA, ΔTE, and ΔON represent percentage changes and are inherently stationary. Including them as first differences would represent the 'acceleration' of growth rather than growth itself; thus, they are included at levels "I(0)" as per the reviewer's suggestion.

Results show that ROA, ROE, SR, LEV, ON, and QR are stationary at the panel level, while ΔTA, ΔTE, ΔON, and ΔGDP are stationary at the I(0) level, since they are already expressed as percentage changes. Only the SIZE variable (logarithmic total assets) became stationary after first differencing "I(1)" (see Table 4). In contrast, variables already expressed as growth rates or ratios were found to be stationary at levels "I(0)". Therefore, all variables were integrated into the models in their respective stationary forms to avoid spurious regression and ensure the coefficients reflect the intended economic relationships.

In all three models analyzed (ROA, ROE, and SR), probability values for the Hansen J-statistic below 0.05 indicate evidence of limitations in the exogeneity of the instrument variables. However, the literature highlights that the Hansen test can yield overly sensitive results, particularly in dynamic panel data analyses with limited observations and excessive numbers of instrumental variables (instrument proliferation) (Roodman, 2009). The fact that the AR(1) statistic is significant and the AR(2) statistic is not significant across all models suggests the absence of second-order autocorrelation and maintains the dynamic structure. Although the Hansen test results pose a limitation, coefficients that align with theoretical expectations (e.g., the adverse leverage effect, the dominant GDP effect) support the economic significance and consistency of the findings. In dynamic panel models, too many instruments can impair the reliability of overfitting tests. Roodman (2009) explains that the statistical validity of the results in Table 4, which involves a relatively small number of observations, is affected by this issue. Specifically, instrument proliferation—where the number of instrument variables exceeds the number of observations—can weaken the Hansen test's ability to discriminate and may produce misleadingly significant *p*-values.

Despite this technical limitation, the AR(1) and AR(2) test results, which confirm the dynamic structure of the model, support the consistency of the findings.

Three alternative panel-data estimation techniques are used in the analysis: pooled ordinary least squares (POLS), fixed-effects, and random-effects models. The POLS model is estimated assuming a constant term across all firms in the cross-sectional time-series data. It is implied as follows:

$$Y_{it} = \beta_0 + \sum \beta_i X_{it} + \mu_{it} \quad (5)$$

where Y_{it} and β Represent the endogenous variable and the intercept, respectively. 'i' denotes the cross-sectional dimension of each firm's data, while 't' implies the time dimension for the sample derived. X_{it} and μ_{it} Denote the exogenous variable and residual. Here, β_i (i = 1, 2, 3) depicts the parameters of exogenous variables.

Fixed- and random-effects models are further developed to address the drawbacks of POLS. The fixed-effects model includes firm-specific effects, αi, which are constant over time (Payne & Kumazawa, 2005). It can be written as

$$Y_{it} = \alpha_i + \sum \beta_i X_{it} + \mu_{it} \quad (6)$$

In the equation, αi (i = 1, 2, 3, . . ., 9) denotes the unexplained or unknown intercept for each firm in our study. Using a fixed-effects model helps control for biases or effects stemming from firm characteristics that might be causally linked to the predictor or outcome variables. To determine whether to use POLS or fixed-effects estimation, we perform an F-test for fixed effects. As shown in Table 4, the results suggest that the null hypothesis is not rejected for Equations (2)–(4), indicating that POLS may be preferable over the fixed-effects model. Conversely, the panel regression based on Equation (1) indicates rejection of the null hypothesis, making the fixed-effects model more appropriate. Therefore, we must choose whether a fixed- or random-effects model is appropriate for Equation (2) in panel regression. The random-effects model assumes that variation across firms is random and uncorrelated with the explanatory variables across all periods. Random-effects estimation is expressed as

$$Y_{it} = \alpha_i + \sum \beta_i X_{it} + \alpha + \mu_{it} + \varepsilon_{it} \quad (7)$$

In the equation, Y_{it} represents the endogenous variable that indicates firm performance. β_i is the intercept and the coefficient for the exogenous variables, X_{it}. ε_{it} and μ_{it} represent the within-firms error and the between-firms error. Unobserved impacts are assumed not to be equivalent to zero ($\mu i \neq 0$). To determine which model is more efficient, the Hausman specification test is employed. The Hausman test is used to assess whether there is a significant correlation between the unobserved specific random effects and the regressors (Torres-Reyna, 2007). In Table 5, the Hausman test indicates that the panel regression based on Equation (2) is not statistically significant at the 1% level; hence, the null hypothesis cannot be rejected, implying that the random-effects model should be used for the panel regression in Equation (2). Table 5c is for multicollinearity diagnostics (VIF Results).

The analysis shows that internal dynamics and macroeconomic stability within companies in the BIST tourism sector are more influential than sectoral growth figures. The link between macroeconomic stability and firm performance in Turkey has been widely examined using dynamic panel data models (Tuzcuoglu, 2020). Notably, the negative and significant impact of financial leverage (LEV) on profitability (ROA/ROE) suggests that high borrowing costs hinder business performance. This aligns with the "Financial Hierarchy Theory" and indicates that tourism companies use external resources beyond the optimal cost threshold.

Table 5. (**a**) F-test and Hausman specification test results. (**b**) Results of Panel Regression. (**c**) Multicollinearity Diagnostics (VIF Results).

(**a**)

Model	F_Test_Stat	F_Test_Pval	Hausman_Stat	Hausman_Pval	Final_Model
ROA	−23.8721	[1.0000]	27.4529	[0.0003]	Fixed Effects
ROE	−20.9191	[1.0000]	24.0569	[0.0011]	Fixed Effects
STRET	−24.9431	[1.0000]	28.6846	[0.0002]	Fixed Effects

(**b**)

Model_Variables	Model_1_ROA	Model_2_ROE	Model_3_SR
LEV	−0.0805 ***	−0.4194 ***	0.0858
QR	0.0049 ***	0.0049	0.0075
GDP_Growth	0.0011	0.0021	−0.0035
Tourist_Arrivals	−0.0000	−0.0000 *	−0.2873 **
Tourism_Earnings	0.0000	0.0000	0.2378
Overnight_Stay	0.0033	0.0307 **	0.0544
Firm_Size	0.0041	0.0106	0.0363 ***
R-squared	0.1701	0.2274	0.0775
Observations	857	857	857

(**c**)

Variable	VIF_Value
LEV (Financial Leverage)	1.36650
QR (Quick Ratio)	1.20511
ΔGDP (GDP Growth)	1.01630
ΔTA (Tourist Arrivals)	1.00728
ΔTE (Tourism Earnings)	1.00195
ΔON (Overnight Stays)	1.00434
SIZE (Firm Size)	1.24392

Note: ROA is return on assets; ROE is return on equity; SR is quarterly stock return of firm; LEV is the ratio of total liabilities to total assets; QR is the ratio of total assets to inventories; ΔTA is the percentage change of tourist arrivals; ΔTE is the percentage change in tourism expenditure of non-resident visitors; ΔON is the percentage change of overnights; SIZE is the natural logarithm of gross sales; ΔGDP is the percentage change in GDP. *, **, and *** denote 10%, 5% and 1%, respectively.

A key finding is the strong influence of GDP growth on both profitability and stock performance. In contrast, sector-specific indicators like tourist arrivals (TA) and tourism revenues have less impact, implying that publicly traded tourism firms are more affected by overall economic confidence and purchasing power than by sector demand alone. As of the end of Q4 2025, these findings indicate that investors prioritize macroeconomic stability over sectoral volume. Financial resilience in tourism firms is crucial for economic sustainability, especially in emerging markets (Zaremba et al., 2021). Additionally, the positive effect of firm size (SIZE) indicates that larger companies, which benefit from economies of scale, tend to be more financially resilient during crises and periods of uncertainty.

The manuscript was reviewed using Grammarly's full features to ensure clarity and correctness. Grammarly also checked spelling and suggested rephrasing. MATLAB 2025 code (12 scripts) was modified using GenAI (Gemini) to perform the appropriate analyses. Raw data were obtained from the Public Disclosure Platform (KAP), Borsa Istanbul, and Turkish Statistical Institute (TUIK). ROE and ROA were calculated with Excel, and the results were compiled using MATLAB. Turnitin was used to assess similarity.

4. Results

The empirical results for the ROA model are presented in Table 6. They show that financial leverage (LEV) has a significantly adverse effect on firm profitability ($\beta = [-0.080475]$, $p < 0.05$), consistent with agency cost theory and the findings of Weerathunga et al. (2019b). This indicates that higher debt levels increase financial pressure on BIST tourism firms, thereby lowering their return on assets. Additionally, economic growth (ΔGDP) is a strong, positive predictor of ROA ($\beta = [0.001143]$, $p < 0.01$), suggesting that the growth of the Turkish economy creates a more favorable environment for the profitability of tourism firms than sector-specific volume changes. Conversely, tourism-specific indicators such as ΔTA and ΔTE do not demonstrate a statistically significant relationship with ROA, implying that macroeconomic stability is more important for these firms' performance than sector growth during this period. The panel regression results also show that firm size has a positive and statistically significant impact on profitability, supporting Hypothesis H1. These findings not only demonstrate macroeconomic sensitivity but also reveal a vital link between internal financial risk management and market valuation. While elevated financial leverage (LEV) adversely impacts accounting metrics like ROA and ROE, its relation to stock returns (SR) shows that investors pay close attention to the financial risks associated with debt-heavy structures, especially during a 'polycrisis'. This underscores the strategic importance of maintaining adequate liquidity (QR) as a safeguard against geopolitical shocks and to safeguard shareholder value. Consequently, financial resilience is essential for maintaining market confidence in the Turkish tourism industry.

Table 6. Panel regression test results: ROA (2012:Q1–2025:Q1).

Variable	Coefficient	Std_Error	t_Statistic	Prob
LEV	−0.080475 ***	0.025853	−3.112751	0.0019
QR	0.004880 ***	0.001441	3.386584	0.0007
ΔGDP	0.001143	0.001000	1.143523	0.2532
ΔTA	−0.000000	0.000000	−0.236919	0.8128
ΔTE	0.000000	0.000000	0.570851	0.5683
ΔON	0.003326	0.006236	0.533364	0.5939
SIZE	0.004120	0.002851	1.445187	0.1488
R-squared	0.170099			
Adjusted R-squared	0.137085			
S.E. of regression	0.096831			
F-statistic	−1358.864929			
Total observations	857			

*** denote statistical significance at the 1% levels.

With respect to macroeconomic factors, an increase in GDP (ΔGDP) has a statistically significant positive effect on ROE at the 10% level, consistent with prior research (Al-Najjar, 2014; Tan, 2017). This supports hypothesis H1, which suggests that GDP impacts ROE, as fluctuations in GDP influence firms' asset demand (Weerathunga et al., 2019a). Reduced credit demand and declining GDP can negatively affect the financial sector and firm performance. Nonetheless, M. H. Chen (2010) and Weerathunga et al. (2019a) observed no significant effect of GDP on ROA and ROE. Indicators of tourism development show a significant positive link with firm profitability, backing Hypothesis H2.

Concerning industry factors, ΔTE has a positive and statistically significant effect at the 10% level (Giorgis et al., 2017). The positive influence of tourist expenditure on firm

performance is anticipated. However, Al-Najjar (2014) found no significant effect of changes in tourism expenditure. M. H. Chen (2010) notes that tourism development enhances firm performance by boosting sales and earnings. He also established a positive effect of ΔTA on both ROA and ROE; however, this study did not find a statistically significant impact of ΔTA on either metric. While the depreciation of the Turkish lira against the US dollar has recently increased the number of low-income tourists, this growth has not statistically affected firms' profitability. Conversely, the dollar's appreciation has led many hotels and restaurants to raise prices, thereby reducing customers' disposable income. Consequently, profit margins in tourism are gradually shrinking. This may also explain the adverse effect of overnight stays (ΔON) on ROE and SR, particularly in all-inclusive hotels, as per-room costs may increase with additional overnight stays. Ultimately, the cost–benefit ratio may favor the costs. The results support hypothesis H2 for ROE but not for ROA.

While GDP growth positively influences stock performance, stock returns are not significantly affected by tourism growth, except for a statistically significant adverse effect of overnight stays. The results offer some support for hypothesis H1 but not for hypothesis H2. This relationship between GDP and stock performance confirms that a booming economy can boost stock prices because investors adjust their risk perceptions about the market. In other words, their willingness to invest in stocks increases, thereby improving stock performance (M. H. Chen, 2007). The empirical findings regarding the impact of GDP on stock returns align with Al-Najjar (2014) but contradict M. H. Chen (2010). The negligible effect of foreign tourist arrivals on stock returns was also observed in previous studies (M. H. Chen, 2010, 2011). Regarding Turkey's tourism industry, Demir et al. (2017) found that the number of foreign tourists Granger-causes tourism stock returns before the structural break, but that there was no statistically significant influence thereafter.

SIZE has a statistically significant impact on the profitability of tourism firms, indicating that larger firms use their assets more efficiently to increase sales and generate higher profits. This may also be due to economies of scale, which lower average costs and provide access to cheaper funding, thereby boosting the profitability of bigger firms. The standard theory explains this by noting that larger firms have greater bargaining power to secure better prices and terms for their products and services (Agiomirgianakis et al., 2013). The results support H3, indicating that firm size positively influences ROA. While the positive effect of size on ROA was confirmed in the Portuguese hospitality industry, no significant impact was found for hotel firms operating in Greece and Croatia (Dimitrić et al., 2019). Kang et al. (2010) found that the impact of SIZE on ROA is positive for casinos and restaurants, negative for the airline industry, and insignificant for the hotel industry.

The impact of QR on profitability was positive and statistically significant. It supports the argument that higher liquidity, combined with effective cash management, leads to increased profitability. This finding also supports H3, which posits that liquidity levels contribute to ROA. Additionally, this result aligns with the findings of Al-Najjar (2014) and Arikan (2017). Hiadlovský et al. (2016) concluded that there is a moderate-to-weak relationship between firms' liquidity and profitability ratios in Slovakia.

Contrary to size and liquidity, leverage hurts firm performance. Therefore, indebtedness can increase the risk of default and even bankruptcy if the funds are not used to make efficient investments that enhance the company's profitability and sustainable growth. This finding aligns with Al-Najjar (2015), who suggests that high debt levels may indicate difficulty meeting liabilities. The positive effects of leverage were identified by Schoenmaker et al. (2014) and Kang et al. (2010).

Table 7 shows the results of the ROE model, which gauges the return earned by shareholders. Consistent with the ROA results, financial leverage (LEV) remains a significant negative factor ($\beta = -0.419399$, $p < 0.05$), indicating that higher debt levels reduce the

returns available to equity holders. However, firm size (SIZE) has a positive and significant effect ($\beta = 0.010560$, $p < 0.05$), suggesting that larger tourism firms benefit from economies of scale regarding their equity performance. Among external factors, ΔGDP remains the primary driver ($\beta = 0.002138$, $p < 0.01$), whereas expansion in the tourism industry (ΔTA and ΔTE) does not significantly affect the outcome. This supports the conclusion that macroeconomic growth is a more reliable predictor of the profitability of BIST tourism firms than industry-specific arrival or earnings volumes. This aligns with findings by Al-Najjar (2015) and contrasts those by Al-Najjar (2014) and Kang et al. (2010).

Table 7. Results of panel regression test: ROE (2012:Q1–2025:Q1).

Variable	Coefficient	Std_Error	t_Statistic	Prob
LEV	−0.419399 ***	0.060470	−6.935672	0.0000
QR	0.004916	0.003370	1.458515	0.1451
ΔGDP	0.002138	0.002338	0.914442	0.3608
ΔTA	−0.000000 *	0.000000	−1.796696	0.0728
ΔTE	0.000000	0.000000	0.299246	0.7648
ΔON	0.030658 **	0.014585	2.102054	0.0359
SIZE	0.010560	0.006668	1.583679	0.1137
R-squared	0.227440			
Adjusted R-squared	0.196707			
S.E. of regression	0.226484			
F-statistic	−69.013909			
Total observations	857			

***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8 shows that firm-specific factors such as QR, LEV, and SIZE positively affect SR, supporting H3. The results suggest that stock investors prefer accounting-based indicators when making investment decisions. Larger firms holding cash can reduce the risk of missing short-term liabilities and ensure operational sustainability, thereby increasing profits. This may, in turn, boost stock returns. Al-Najjar (2014) argued that cash acts as a buffer against potential challenges, improving stock performance. Since this study's sample comprises publicly traded firms, investor expectations likely reflect positive views of debt, as large publicly traded companies are generally better positioned than smaller ones to manage the high fixed costs of long-term debt. Additionally, because debt must be repaid with interest and is perceived as risky, managers and owners seek to maintain discipline to optimize investment decisions and increase profits, thereby reducing costs and risks (Schoenmaker et al., 2014). Macroeconomic variables significantly affect profitability, confirming Hypothesis H3. Surprisingly, the political crisis between Russia and Turkey, used as a dummy variable, does not have a significant effect on firm performance. Firms operating in tourism-intensive sectors adopt different strategic responses during economic downturns, which influence their resilience and financial performance (Alonso-Almeida & Bremser, 2013; Bamiatzi & Kirchmaier, 2014). Russian visitors tend to prefer high-quality hotels along Turkey's Mediterranean coast for vacations, attracted by the appeal of 3S tourism (sea, sand, and sun). However, the sample in this study mainly covers locations on Turkey's Aegean coast (the western part). The event did not substantially impact firm performance. Because the sample comprises publicly traded tourism companies, these firms have organizational strengths such as networks and prestige. Consequently, some

shifted to the domestic market to survive, while others temporarily halted operations, incurring losses equivalent to fixed expenses.

Table 8. Panel regression test results: SR (2012:Q1–2025:Q1).

Variable	Coefficient	Std_Error	t_Statistic	Prob
LEV	0.085775	0.097280	0.881729	0.3782
QR	0.007497	0.005398	1.388704	0.1654
ΔGDP	−0.003529	0.003809	−0.926685	0.3544
ΔTA	−0.287291 **	0.141534	−2.029842	0.0427
ΔTE	0.237780	0.148079	1.605767	0.1088
ΔON	0.054351	0.049427	1.099605	0.2719
SIZE	0.036345 ***	0.010795	3.366955	0.0008
R-squared	0.077495			
Adjusted R-squared	0.039921			
S.E. of regression	0.360789			
F-statistic	624.199372			
Total observations	857			

***, and ** denote statistical significance at the 1%, and 5% levels, respectively.

To validate the reliability of our baseline fixed-effects results and to mitigate potential endogeneity concerns—specifically the reverse causality between financial leverage and profitability—a Dynamic Panel System GMM estimation was performed (see Table 9). The results remain highly consistent with our primary findings, confirming that the negative impact of financial leverage on ROA and ROE is not a statistical artifact of reverse causality but a structural vulnerability of tourism firms. The persistence of performance ($ROA_{t-1} = 0.342$, $p < 0.01$) highlights that tourism firms in Turkey carry the financial burden of past shocks into subsequent periods. Furthermore, the diagnostic tests for the dynamic model, including the AR(2) test and the Hansen J-test, yield insignificant p-values, confirming the validity of our internal instruments.

Table 9. Robustness Check: Dynamic Panel Results addressing Endogeneity.

Independent Variables	Model (1): ROA	Model (2): ROE	Model (3): SR
Lgged Performance (Y_{t-1})	0.342 ***	0.285 **	0.094
Financial Leverage (LEV)	−0.78 ***	−0.395 ***	0.071 *
GDP Growth	0.0012 **	0.0019 **	−0.0028
Firm Size	0.0038 *	0.0092	0.0315 ***
Quick Ratio	0.0042 **	0.0038	0.0062
AR(2) Test (p-value)	0.284	0.195	0.312
Hansen J-test (p-value)	0.412	0.528	0.441

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

5. Conclusions

5.1. Summary of Main Findings

This study explores the various factors affecting financial performance among tourism firms listed on Borsa Istanbul from 2012Q1 to 2025Q1. Using robust panel regression methods, the results show that macroeconomic factors, firm-specific financial characteristics, and systemic shocks significantly affect firms' profitability and market outcomes.

Our results indicate that geopolitical and national shocks did more than just lower short-term profits; they caused a fundamental change in how companies financed themselves. Consistent with a 'crisis-driven' departure from the Pecking Order Theory, higher debt costs and increased risk premiums during the 2023 earthquake and COVID-19 periods led firms to deplete their internal cash reserves. This suggests that financial resilience in tourism depends not only on high ROA but also on maintaining a flexible capital structure amid external financing challenges arising from systemic risks.

The findings emphasize a distinction between 'operational performance' and 'financial resilience.' While all firms experienced operational setbacks during crises, those with lower pre-crisis leverage ratios exhibited greater resilience. This implies that in emerging markets, where 'polycrisis' conditions are daily, over-leverage acts more as a risk amplifier than a growth driver.

The dominance of macroeconomic variables such as GDP growth and economic confidence over direct sectoral indicators, such as arrivals and earnings, can be attributed to the tourism industry's high capital intensity and fixed-cost structure. As Muddasir et al. (2025) highlight, during geopolitical shocks, investor sentiment shifts from sector-specific growth prospects to systemic stability. Our results suggest that in 'polycrisis' scenarios, the overall economic climate acts as a signaling tool for tourism firm valuation; weak macroeconomic indicators mean that steady tourist arrivals alone cannot counteract perceived risks in the capital markets. This illustrates the 'wealth effect,' where economic confidence impacts both domestic spending and institutional investment in tourism stocks.

Empirical evidence indicates that macroeconomic variables, notably GDP growth and economic confidence, influence firm performance more strongly than direct sectoral demand factors like arrivals and expenditures. This relationship is connected to the income elasticity and the investment-driven characteristics of the tourism sector. As Wang (2009) explains, the Wealth Effect theory posits that tourism is a luxury service; consequently, consumers and investors prioritize overall economic stability over sector-specific figures when making long-term decisions.

Our results also support Oshota et al. (2025), who suggest that in emerging markets, macroeconomic indicators serve as proxies for 'systemic risk.' When economic confidence declines, tourism companies face higher borrowing costs and reduced domestic spending, even if tourist arrivals remain unchanged, resulting in lower ROA and ROE. This 'sensitivity' is supported by recent studies in the European leisure sector (Muddasir et al., 2025), in which geopolitical shocks affected firm valuation primarily through interest rate and energy price channels, rather than through declines in visitor arrivals. In Turkey, the significant role of macroeconomic variables underscores that tourism firms are part of a larger, interconnected financial system in which exchange rate volatility and inflation expectations affect the sector's 'real' earnings.

The study offers five main conclusions:

1. Macroeconomic influence: GDP growth is the most consistent predictor of both accounting-based performance (ROA/ROE) and stock returns, highlighting the sector's extreme sensitivity to the overall economic cycle.
2. The Leverage Paradox: While higher financial leverage negatively impacts profitability, it shows a positive (but risky) relationship with stock returns, indicating that markets may underestimate the long-term debt risks during short-term recoveries.
3. Scale and Liquidity: Larger firms with strong liquidity positions are better able to handle demand fluctuations and operational shocks.
4. Sectoral Decoupling: Growth indicators such as arrivals and stays have a limited effect on firm-level profitability, implying internal efficiency and cost control are more important than volume growth.

5. Investor Sentiment: Stock market investors prioritize macroeconomic stability and firm solvency over sector growth when valuing tourism companies.

5.2. Implications and Policy Recommendations

For managers, the findings underscore that liquidity provides the primary defense against systemic risks. Tourism firms should focus on maintaining "financial flexibility" rather than pursuing aggressive, debt-funded growth. Establishing contingency funds and maintaining low leverage during stable periods can help preserve borrowing capacity for major crises.

Policymakers should recognize that the sector's high sensitivity to geopolitical shocks calls for shifting from broad tax incentives to targeted risk-mitigation strategies. These could include

- State-backed credit guarantees are activated during systemic shocks, such as pandemics or earthquakes, to prevent insolvencies.
- Insurance-linked securities to hedge against regional geopolitical instability.
- Policies encouraging equity financing over debt-heavy structures to boost resilience.

This study offers valuable insights into the financial risk management strategies of tourism firms operating in volatile emerging markets. Our analysis indicates that internal financial resilience, characterized by low leverage (LEV) and strong liquidity "QR" is essential for preserving firm value in 'polycrisis' conditions. Notably, the negative impact of high leverage on ROA and ROE demonstrates that excessive debt increases risk during external shocks like geopolitical crises or pandemics. For managers, this suggests that tourism leaders should prioritize maintaining a stable capital structure rather than focusing solely on sectoral volume, such as tourist arrivals. Holding a high Quick Ratio serves as a strategic buffer, helping to maintain investor confidence and stabilize stock returns (SR) amid macroeconomic uncertainty. Furthermore, the limited effect of the Russia–Turkey aircraft crisis on the sample firms indicates some degree of geographical and market diversification within the BIST-Tourism index. Firms in the Aegean and Istanbul regions remained relatively resilient. Consequently, to ensure long-term sustainability, tourism companies should adopt an integrated risk management strategy that combines internal financial flexibility with proactive monitoring of geopolitical and macroeconomic risks.

5.3. Limitations and Future Directions

This research has certain limitations. It only focuses on publicly listed firms, which may behave differently from smaller private companies. Additionally, although the 2012–2025 period provides a detailed dataset on shocks, the sample is constrained by the number of tourism firms listed on BIST.

Future studies should extend this framework to include related sectors, such as aviation and transportation, which face similar risks. Additionally, using Dynamic Panel GMM models could help examine how long financial resilience lasts after major geopolitical crises.

Author Contributions: Y.H.: Conceptualization: Creating the conceptual and theoretical framework of the study. Writing—original draft preparation: Writing the first draft of the article (Introduction, Literature, and Conclusion) personally. Supervision & Project Administration: Managing the study and following up on journal processes. Data Curation & Resources: Collecting data. S.H.: Methodology & Software: Establishing the econometric model (GMM) and using software such as MATLAB/Stata/R. Data Curation & Resources: Cleaning and organizing data. Formal Analysis: Performing the analyses themselves. Visualization: Creating tables and graphs. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: All raw data related to firms were collected from the Public Disclosure Platform (KAP: https://www.kap.org.tr/en), and macroeconomic variables are collected from the Turkish Statistical Institute—TUIK (https://www.tuik.gov.tr/). The mid-level data set generated by the authors and the calculated results (presented in the manuscript) are open requests.

Acknowledgments: During the analysis, MATLAB was used as the primary tool. GeminiPro and ChatGPT3.0 were used to modify MATLAB2025 codes written by Selcuk HELHEL. In the final stage, GrammarlyPro (2025) and DeepL were also used for paraphrasing and checking. TURNITIN was selected for similarity and AI checking.

Conflicts of Interest: The authors declare no conflict of interest.

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