

Macro-environment and financial resilience: a longitudinal analysis of the “Mediterranean Tourism paradox” in the Greek hospitality sector (2005–2024)

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Maria Kalogera, Antonios Georgopoulos and Eleftherios Aggelopoulos
Department of Business Administration, University of Patras, Patras, Greece, and
Elen Paraskevi Paraschi
Department of Tourism Management, University of Patras, Patras, Greece

Abstract

Purpose – This study examines the influence of macro-environmental forces on the financial performance of hospitality businesses using the extended PEST-DG model as a mapping mechanism. The main objective of the research is to transform exogenous environmental variables into specific data by directly linking them to the measurable accounting indicators of tourist accommodation units.

Design/methodology/approach – The research processes an unbalanced panel of 86 companies (2–3★, 4–5★ hotels and platform-based operators), using the Hausman-Taylor estimator to incorporate time-invariant variables that fixed effects models are unable to determine. Financial performance is approximated through three indicators in six sub-periods (2005–2024) aligning the empirical part with the PEST-DG theoretical framework.

Findings – First, the “Mediterranean Paradox” is confirmed, where increasing arrivals do not ensure business profitability. Second, the superiority of Return on Assets (ROA) in asset-light models (Airbnb) is structural but is accompanied by a non-linear “leverage penalty” that increases vulnerability to debt. Third, the star category only affects through interactions in times of crisis and finally, paradoxically, Capital Controls improved profit margins, imposing digital payments that limited the underground economy.

Practical implications – The study proposes to shift the revenue strategy from arrivals volume to tourism receipts and to calibrate the support mechanisms based on the asset structure of each category. Furthermore, it highlights that the exclusive use of the ROA indicator to evaluate Airbnb operators is misleading, as high leverage acts as a vulnerability multiplier that undermines profitability in times of crisis.

Originality/value – This study is the first application of the Hausman-Taylor estimator in the field of hospitality financial management in the Mediterranean region. Furthermore, it offers the first verified profitability comparison between traditional hotel units and operators based on digital platforms; to the authors’ knowledge, the first such comparison in the Mediterranean hospitality context, made possible by the unique natural experiment of Law 4472/2017. From a methodological point of view, the PEST-DG framework evolves from a qualitative strategic tool to a fully traceable quantitative map.

Keywords Mediterranean tourism paradox, PEST-DG framework, Hotel financial performance, Hausman-Taylor estimator, Asset-light model, Capital controls, Leverage risk, Panel data

Paper type Research article

1. Introduction

According to Aristotle, prudence is not limited to the theoretical knowledge of rules, but is judged primarily by the ability to recognize how these rules are formed in reality. Similarly, for

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an economist or a consultant accountant in the hotel industry, this virtue corresponds to the ability to recognize a social shock or geopolitical unrest behind the numbers of a profit and loss account or a government decision. Thus, a hotel's balance sheet ceases to be an accounting document and becomes a sensitive seismograph that can detect the contraction of the economy before central banks and the reduction in revenues caused by a pandemic or extreme energy costs. In Greece, this issue takes on almost existential dimensions, since tourism is the basis of the economy and accounts for 30% of GDP. However, the study of 86 Greek hospitality companies over the twenty-year period 2005–2024 reveals some paradoxes that overturn traditional approaches.

The analysis reveals a striking contradiction, since during the financial crisis, while arrivals increased by 47% ([Institute of the Greek Tourism Confederation \[INSETI\], 2024](#)), profitability remained at negative levels, which can overturn the linear relationship between demand and profit. At the same time, the superiority of the “asset-light” model is highlighted, thanks to which short-term rental companies achieve a multiple return on assets (ROA) compared to traditional hotels, thereby compensating for their lower profit margins. Even capital controls have worked unexpectedly and pushed for a violent but necessary rationalization of expenses. The period 2022–2024 looks like a “hollow” recovery, where unsustainable energy costs separate record revenues from the real financial health of companies.

This study attempts to interpret these contradictions by extending the classic PEST framework with the demographic and geopolitical dimension (PEST-DG) and linking it to the hotel industry. For the empirical analysis, panel data and [Hausman-Taylor estimators \(1981\)](#) were used, a methodological choice that proved to be crucial, as it allows the simultaneous examination of fixed characteristics, such as star category, and dynamic macroeconomic changes. Thus, a deeper understanding of how the international environment affects the Greek hotel reality is offered.

This study seeks to fill significant gaps in the international literature. While macro-environmental frameworks such as PEST are widely used in strategic research in the hotel sector ([Mucharreira et al., 2019](#); [Dogru and Sirakaya-Turk, 2018](#)), no study in the Mediterranean context has operationalized them as a quantitative transmission mechanism that directly links exogenous forces with audited accounting ratios at the company level. At the same time, the methodological approach to hotel profitability is often limited to fixed-effects estimators ([Dimitrić et al., 2019](#); [Magoutas et al., 2016](#); [Dimitropoulos, 2018](#)), which eliminate the time-invariant variables (star rating and business model) that carry the greatest strategic weight. The Hausman-Taylor estimator, which resolves this identification problem without the need for external tools, remains virtually unknown in hotel finance in the Mediterranean. Furthermore, the competitive asymmetry between high-intensity hotels and low-intensity platforms, documented at the demand level ([Dogru et al., 2020](#); [Zervas et al., 2017](#)), had never been analyzed using audited financial statements, as the institutional conditions for such a comparison did not exist. Law 4472/2017, which establishes the Registry of Short-Term Accommodation Properties in Greece, offers a unique natural experiment that this research leverages for the first time.

Beyond its empirical findings, this study offers a mechanism that can be generalized beyond the Greek case: it explains *when* macro-environmental change actually reaches firm profitability. The key point is that more demand does not automatically mean more profit. Demand growth improves performance only when it comes with pricing power. When growth is instead driven by low-spending visitors displaced from rival destinations, volume rises but value does not, and profitability stalls. This qualifies the common view, rooted in carrying-capacity and tourism-area-life-cycle thinking, that more arrivals are inherently good; it specifies the conditions under which extra demand fails to convert into profit. The same logic clarifies the asset-light finding through a resource-based lens: when demand is volatile and low in value, the fixed-cost structure of asset-heavy hotels turns from an advantage into a liability, while asset-light operators adapt more easily. The mechanism should therefore apply to any

destination facing displacement-driven demand and competition between ownership-heavy and platform-based models.

The paper follows a multi-stage approach, starting with a literature review (Section 2) and the development of the PEST-DG framework, with a focus on how its factors are reflected in the accounting data of the companies (Section 3). It then focuses on specifying the mechanisms of the “Mediterranean tourism paradox” in Greece (Section 4), while the empirical core focuses on the analysis of ICAP data through various Hausman-Taylor models (Section 5). The work concludes with the presentation of the practical implications and the summary of the conclusions (Section 6).

2. Literature review: crises, financial performance and structural contradictions in the hospitality industry

2.1 Macroeconomic shocks and their transmission to the firm level

Researchers (Okumus, 2004; Cró and Martins, 2017; Smeral, 2012; Papatheodorou *et al.*, 2010; Chen, 2011) who approach the impact of macroeconomic crises on the financial performance of traditional distinguished two categories. Those that focus on aggregate measures, such as arrivals and revenue per available room (RevPAR), and those that are limited to the analysis of accounting ratios at the company level, are usually derived from the broader macroeconomic environment. Although studies such as Mucharreira *et al.* (2019) recognize macroeconomic variables as critical determinants of corporate performance, they do not distinguish them by qualitative characteristics, such as category or business model. Similarly, Dogru and Sirakaya-Turk (2018), despite highlighting the importance of GDP and seasonality, do not take into account the deep structural ruptures caused by the public debt crisis in the Mediterranean economic systems after 2009.

More recent work links macro-environmental disruption directly to firm-level resilience and performance. Sakellarios *et al.* (2025) examine micro and small firms in Greece and Cyprus after the sovereign-debt crisis, showing how prolonged macroeconomic stress reshapes firm performance and adaptive strategy, while Prayag *et al.* (2018) link organizational resilience to firms’ financial performance in the tourism sector, showing how it shapes their capacity to absorb and recover from external shocks. Evidence from an adjacent service sector reinforces this transmission logic: Nouraldeen (2025) traces how a macro-financial crisis fed through to the financial performance of Lebanese banks, conditional on governance structures. These studies motivate the present multi-crisis, firm-level approach but stop short of a framework mapping specific macro-forces onto individual accounting lines.

The present study addresses this gap by treating the Greek hospitality sector as a natural laboratory in which six successive macro-shocks of different nature are simultaneously reflected in audited firm-level financial statements over twenty years.

2.2 Asset-light vs. asset-heavy oriented models

The emergence of the sharing economy and the dominance of digital short-term rental platforms have introduced a new form of competitive pressure in the hospitality industry, which goes beyond traditional pricing or availability issues. Dogru *et al.* (2020) described the so-called “Airbnb paradox”, where the rapid spread of platforms coexists with intense pressure on revenue (RevPAR) of traditional hotels, highlighting a deep competitive asymmetry between “asset-heavy” and “asset-light” business models. However, these analyses, like those of Zervas *et al.* (2017) or Guttentag *et al.* (2018), are typically limited to demand and occupancy indicators. The absence of audited financial statements has made it impossible to make a meaningful comparison of the profitability, leverage and efficiency of these two business models.

Beyond demand-side metrics, a parallel stream links hospitality business models to their resilience under crisis: Elshaer and Saad (2022), for instance, show that adaptive performance

and institutional orientation underpin business continuity in tourism and hospitality firms during disruption. Whether the asset-light model confers comparable resilience in audited financial terms, however, remains untested, a gap this study addresses through RQ4.

At this point, the Greek case offers a rare methodological advantage. The institutionalization of the Short-Term Accommodation Property Registry through Law 4472/2017 and its operation since 2017 created for the first time a single basis for recording activity, through which short-term rental companies became recognizable as a distinct category in commercial databases, allowing for the first time the systematic retrieval and comparison of their financial data with those of traditional hotels.

The present study exploits this institutional opening to conduct, for the first time, a systematic comparison of the two models on the basis of audited accounting data, directly addressing the third research question.

2.3 Research gaps and empirical contribution

The literature shows a clear gap in research. Research focuses either on national macro-measures (revenues, RevPAR, revenue) or on individual balance sheets, where there are no documented mechanisms for the connection between them. This gap remains structural. Without a framework that maps the transmission of macro power to the profit and loss account, a comparison between crises of different nature becomes impossible. This study introduces the PEST-DG framework and provides a theoretical map with full traceability from macroeconomic changes to the accounting measure. From a broader perspective, [Magoutas et al. \(2016\)](#) analyzed the determinants of the profitability of Greek tourism during the period 2005–2011, highlighting how the economic crisis of that time transformed the structural pillars of its performance. The present work significantly expands this field of research, extending the time horizon by an additional thirteen years and incorporating three consecutive macroeconomic crises (capital controls, Covid-19, and the energy crisis) that fall entirely outside their original analytical framework.

At the same time, the literature suffers from a methodological impasse that has gone largely unnoticed. The dominance of fixed-effects estimators eliminates by definition the time-constant variables (star rating, business model type) precisely those that carry the greatest strategic importance. The Hausman-Taylor estimator (1981), which uses the time averages of exogenous variables as internal instruments, solves this identification problem without requiring external instruments, presenting an application that remains essentially unexplored in the Mediterranean hotel finance literature. Added to these two gaps is the opportunity created by Law 4472/2017 with the institutionalized operation of the Short-Term Accommodation Property Registry since 2017, which allows for the first time the comparison of traditional hotels and platform-based businesses on the basis of audited balance sheets with common indicators of ROA, EBITDA Margin and Net Profit Margin. This question remains unexplored in the international literature, as no equivalent legislative framework in another European country has created the conditions for a comparable empirical analysis based on audited financial data.

Against this background, the present study is guided by four interrelated research questions:

- RQ1. How do PEST-DG macro-environmental forces determine the financial performance of Greek hospitality firms over the long-term period 2005–2024?
- RQ2. Is the “Mediterranean Tourism Paradox” empirically evident when analyzing individual firm-level balance sheets?
- RQ3. How do star classification and capital structure influence profitability, and does this relationship shift during economic crises?
- RQ4. Do asset-light business models consistently outperform traditional hotel structures when controlling for size and leverage?

3. The PEST-DG framework applied to hospitality accounting

3.1 Theoretical foundations and extension

The classic PEST framework classifies macroenvironmental forces into four dimensions: Political, Economic, Social and Technological (Johnson and Scholes, 1999). Building on this established tool, whose relevance to corporate financial performance is documented by Mucharreira *et al.* (2019) and Dogru and Sirakaya-Turk (2018), the present study introduces two further dimensions, Demographic and Geopolitical (PEST-DG), and evolves the framework from a qualitative strategic instrument into a quantitative mapping mechanism. Each dimension is traced through four levels: key macro-forces, transmission channel, research indicators (ROA, Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) Margin, Net Profit Margin (NPM), Debt Ratio), and specific accounting lines, as shown in Table 1. In this way, the framework provides a direct empirical response to the first research question, establishing full traceability from macro-force to accounting line.

3.2 Sub-period classification: PEST-DG periodization

The application of the PEST-DG framework to empirical data requires the definition of time sub-periods that correspond to distinct phases of dominance of specific macro-forces. This delimitation is not arbitrary but is documented based on objective criteria such as GDP changes, institutional events, tourism data from the Bank of Greece and energy indicators from Eurostat. At the same time, each sub-period is explicitly linked to the dominant PEST-DG dimension that characterizes it but also to the transmission mechanism that it activates (i.e. the way in which this force reaches the financial numbers). The result is six theoretically documented sub-periods, as reflected in Table 2.

The analysis of Table 2 brings to light a crucial peculiarity of the Greek reality: no time period can be interpreted through a single dimension of the PEST-DG framework. On the contrary, the evolution of the industry is determined by the confluence of different forces. The period 2009–2014, for example, was not simply an economic recession, but a political-economic coincidence (E + P), where the 26% contraction of GDP and the imposition of the Memoranda were two sides of the same systemic shock.

Table 1. PEST-DG framework applied to hotel financial accounting

Dimension	Key forces	Primary transmission channel	Research indicator and accounting line
P – Political	Tax policy, labour law, capital controls, visa regimes	Compliance and labour cost compress margins	NPM, EBITDA Margin <i>Revenue, Net Profit</i>
E – Economic	GDP, interest rates, inflation, exchange rate	Demand shifts revenue; input and financing costs erode profit	ROA, EBITDA Margin, Debt Ratio <i>Revenue, Total Assets, Liabilities, COGS</i>
S – Social	Travel trends, sharing economy, consumer behaviour	Airbnb competition & Average Daily Rate (ADR) compression alter revenue mix	ROA, NPM <i>Revenue, Net Profit</i>
T – Technological	OTA platforms, AI pricing, PMS systems	Distribution costs and operational efficiency affect margins	EBITDA Margin, ROA, <i>Total Assets, Revenue, COGS</i>
D – Demographic	Ageing markets, millennials, Gen-Z, health tourism	Segment mix and length of stay reshape revenue structure	NPM, EBITDA Margin <i>Revenue, Net Profit</i>
G – Geopolitical	Wars, terrorism, energy shocks, instability	Demand collapse and energy cost explosion hit assets and equity	ROA, Debt Ratio, EBITDA Margin <i>Revenue, Total Assets, Equity</i>

Table 2. Sub-period mapping to PEST-DG dimensions

Sub-period	Dominant PEST-DG	Key mechanism	Tourism receipts
Pre-Crisis	E (Economic)	Credit expansion; GDP growth; rising tourist receipts	€14.8 to €15.9 bn
Financial Crisis	E + P	GDP –26%; Memoranda I and II Mediterranean Paradox: arrivals +47% but ADR –17%	€14.9 to €22.0 bn
Capital Controls	P (Political)	Banking restrictions (28/6/2015); capital uncertainty Firm financing pressure	€26.1 to €28.1 bn
Recovery	E + S + T	Controls lifted; tourism boom; Airbnb emergence Law 4472/2017; digital platform expansion	€27.2 to €33.1 bn
Covid-19	G + S	Pandemic; near-total shutdown 2020 Rapid partial recovery 2021	€7.4 to €14.7 bn
Tourism Recovery and Energy Crisis	G + E	Russia–Ukraine war; energy costs +186% Record arrivals 40.7 mn; hollow recovery paradox	€32.2 to €40.7 bn

Sources: World Bank (GDP), Eurostat (Electricity), Bank of Greece (Tourism Revenues)

The Capital Controls (2015–2016) constitute the most revealing sub-period. While the banking suffocation is classified under the Political dimension (P), its effect on the hotel industry was paradoxically positive. The main change was not only in the volume of tourism revenues (+25% compared to the crisis period based on Bank of Greece evidence), but in their accounting structure. The restriction of cash forced the widespread use of electronic transactions, which shrank the underground economy and strengthened declared profit margins (Hondroyannis and Papaoikonomou, 2017).

A threefold catalyst (E + S + T) underpinned the 2017–2019 upturn, as economic growth, the rise of platform-based lodging, and the market dominance of OTAs (Online Travel Agency) intersected to force a structural shift in the industry’s operational paradigm.

In contrast, the pandemic (2020–2021) brought the most violent discontinuity in twenty years (G + S). Tourism revenues collapsed by 77% in 2020 (from €33.1 billion to €7.4 billion), before a partial recovery in 2021 (+98% to €14.7 billion). The transmission mechanism operated simultaneously via the geopolitical dimension (G), with the restriction of global mobility, and the social dimension (S), with the radical change in consumption patterns due to health insecurity.

The most complex scenario, however, is reflected in the recent period 2022–2024 where we observe the simultaneous effect of two conflicting forces (G + E). While geopolitical instability stemming from the invasion of Ukraine sent energy costs skyrocketing, the market’s underlying economic momentum simultaneously drove revenues to historic highs.

4. Greece as a PEST-DG laboratory: the Macro-Environment 2005–2024

4.1 The three mechanisms of the Mediterranean Tourism paradox

The twenty years under review bring to light the “Paradox of Mediterranean Tourism”, i.e. the explosive increase in demand during periods of crisis without achieving corresponding profits. This phenomenon was triggered by the following mechanisms. Initially, despite the memoranda, the Geopolitical Shift Phenomenon transformed Greece into a “safe haven” due to the instability in Egypt and Tunisia. This displacement is inherently a Mediterranean-basin dynamic rather than a purely national one, since demand redistributes among competing Mediterranean destinations; analogous crisis-driven demand asymmetries across Southern and Mediterranean Europe are documented by Lazarević and Stanišić (2023). However, this

influx of visitors had no pricing power, as the need for security attracted a clientele with a high price sensitivity index, reducing average spending. At the same time, while internal devaluation improved cost competitiveness, it paradoxically limited revenues per arrival to around 530 euros, a benchmark that remained largely stagnant throughout the subsequent phases of recovery. Finally, the Global Tourism Boom acted as an “external blood donor,” maintaining the illusion of a thriving industry in national statistics, while in reality corporate balance sheets showed continued pressure. These three mechanisms collectively explain the paradox posed by the second research question that attempts to explain why the expansion of demand at the aggregate level failed to generate profitability at the firm level.

Table 3 captures the scope of the macroeconomic disruption for the entire twenty years: from the violent fluctuation of GDP (ranging from -9.99% to $+8.70\%$) and unemployment that reached 27.30% , to the most extreme distribution of the dataset, that of the electricity price (skewness = 3.442), which reflects exclusively the 2022 surge to $\text{€}0.460/\text{kWh}$, a fivefold increase in just one year. Moreover, three contradictions stand out: (1) tourism revenues held near pre-crisis levels during the 2009–2014 recession, (2) arrivals reached 27.10 million during Capital Controls while unemployment hit 24.20% ; and (3) 2022–2024 combines record revenues with the highest electricity price in twenty years.

Figure 1 visually illustrates the central paradox of the twenty years under review. Tourist arrivals follow an overall upward trajectory, from 16 million in the Pre-Crisis period to 35 million arrivals during the Tourism Recovery 2022–2024. Revenue per arrival moves in the opposite direction, shrinking from $\text{€}739$ to $\text{€}530$ according to Capital Controls and remaining at $\text{€}540$ – $\text{€}566$ since then, i.e. consistently below pre-crisis levels. The gap between the two axes (the left one that rises and the right one that never recovers) is the most eloquent visual representation of the Mediterranean Tourism Paradox as more tourists does not necessarily mean more profits for businesses in the sector.

5. Micro-environment: firm-level evidence from ICAP DataPrisma

5.1 Data and sample

The empirical analysis is based on an unbalanced panel of 86 companies (1,118 observations) from the ICAP DataPrisma database (2005–2024). The sample consists of 26 two-to-three-star (2–3★) hotels, 41 four-to-five-star (4–5★) units and 19 short-term rental companies (Airbnb-type) which have been included since 2017. The limited number of the latter ($N = 19$) is due to their recent entry into the market, the recent institutional framework (Law 4472/2017) and the obligation to publish financial statements (S.A., Ltd.), excluding individuals. Despite its size, this sample functions as a census of registered corporate Airbnb providers in Greece, ensuring the representativeness of the organized segment of the market. More broadly, because the panel is drawn from corporate filers (S.A. and Ltd.) in ICAP DataPrisma, it represents the organized, incorporated segment of Greek accommodation rather than the numerous small, family-run and individually operated units; the sector-level conclusions and policy implications that follow should accordingly be read as applying to this corporate segment.

To ensure the reliability of the results, three selection criteria were applied: (1) six years of continuous data, (2) positive assets and (3) the absence of inconsistencies in accounting. This panel data approach is consistent with recent firm-level empirical studies on Greek companies ([Rompotis, 2024](#)), while the focus on audited accounting statements rather than market data reflects both the unlisted nature of the sample firms and the methodological priority of capturing balance-sheet transmission mechanisms over market-price dynamics.

To limit the effect of outliers, the dependent variables were winsorized at the 1st and 99th percentiles. **Table 4** encodes the identification of the variables, the calculation formulae and the expected direction of the effects. The use of the Hausman-Taylor estimator requires the classification of the variables into time-varying endogenous (firm characteristics), time-varying exogenous (macroeconomic fluctuations) and time-constant exogenous (hotel star rating, legal form). This classification reflects the economic structure of the data-generating

Table 3. Descriptive statistics and sub-period mean analysis of Greek macroeconomic indicators (2005–2024)

Variable/Sub-Period	Mean						Full period (2005–24)	Min	Max	Skewness
	Pre-crisis (2005–08)	Financial crisis (2009–14)	Capital controls (2015–16)	Recovery (2017–19)	Covid-19 (2020–21)	Tourism recovery & energy crisis (2022–24)				
GDP (%)	2.95	–4.92	–0.10	1.97	–0.25	3.30	–0.13	–9.99	8.70	–0.575
Unemp. (%)	8.70	19.63	24.20	19.37	15.50	11.17	16.2	7.70	27.30	0.350
Inflation (%)	3.45	1.28	–0.55	0.80	–0.35	5.50	1.93	–1.40	9.30	1.045
Tourism (€bn)	11.62	11.37	14.35	16.30	6.50	19.96	13.3	4.30	21.60	0.233
Arrivals (mn)	15.72	17	27.10	30.13	11.05	35.30	21.9	7.40	40.70	0.534
Electricity (€/kWh)	0.090	0.115	0.133	0.140	0.158	0.282	0.145	0.085	0.460	3.442
Rev/Arrival (€)	739	673	530	540	586	568	628	519.60	777.80	0.238

Note(s): Based on 20 annual country-level observations

Source(s): World Bank (GDP), Eurostat (Unemployment, Electricity), ELSTAT (Inflation), and Bank of Greece (Tourism Revenues and Arrivals)

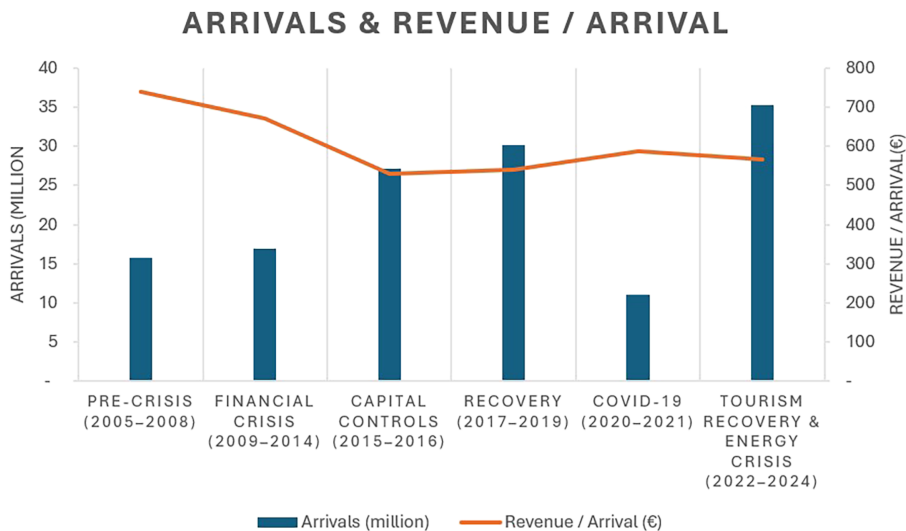


Figure 1. Tourist arrivals and revenue per arrival by sub-period. **Sources:** Bank of Greece (Tourism revenues and arrivals)

Table 4. Variable definitions and Measurement | TV = time-varying; TI = time-invariant, TVX = TV exogenous, TVN = TV endogenous

Variable	Symbol	Formula/Definition	HT role
Return on Assets	ROA	Net Profit/Total Assets	Dependent
EBITDA Margin	EBITDA Margin	EBITDA/Sales	Dependent
Net Profit Margin	NPM	Net Profit/Sales	Dependent
Debt Ratio	DebtRatio	(Total Assets – Equity)/Total Assets	TVN
Liquidity Ratio	LiqRatio	Current Assets/Short-Term Liabilities	TVN
Firm Size	ln(TA)	Natural logarithm of Total Assets	TVN (Model B)
Financial Crisis	D_Crisis	= 1 if 2009–2014, else 0	TVX
Capital Controls	D_CapCtrl	= 1 if 2015–2016, else 0 (Model A)	TVX
Recovery	D_Recovery	= 1 if 2017–2019, else 0 (Model A)	TVX
Covid-19	D_Covid	= 1 if 2020–2021, else 0	TVX
Tourism	D_Tourism	= 1 if 2022–2024, else 0	TVX
Recovery			
Tourism Growth	TourismGrowth	Annual % change in tourism receipts (€bn)	TVX
2–3 Stars dummy	Stars23	= 1 if 2–3★ hotel, else 0 (ref: 4–5★); Model A only	TI Exogenous
Airbnb dummy	StarsAirbnb	= 1 if Airbnb operator, else 0 (ref: all hotels); Model B	TI Exogenous

process: firm-level financial ratios such as leverage and liquidity are jointly determined with profitability and are therefore treated as endogenous, whereas national macro-environmental indicators are plausibly exogenous to any individual, price-taking accommodation firm that cannot influence aggregate tourism receipts or macro-regimes, while star rating and legal form are time-invariant and exogenous by construction. This approach has advantages over traditional fixed effects, as it allows the estimation of time-constant parameters, which ensures a comprehensive interpretation of the performance within the framework of the PEST-DG.

5.2 Descriptive analysis and Kruskal-Wallis tests

Table 5 presents descriptive statistics (mean and standard deviation) for all performance and control variables across the six sub-periods. Notable patterns include the progressive growth of total assets in 4–5★ hotels (from €37M in 2005–08 to €129M in 2022–24), the sharp deterioration of ROA relative to the preceding period during the Financial Crisis (–0.39% for 2–3★, –0.21% for 4–5★, versus +1.50% and +0.23% in the Pre-crisis period) and Covid-19 (–2.15% for 2–3★, –0.26% for 4–5★, versus +2.63% and +3.61% during the Recovery, 2017–19), and the markedly lower asset base of Airbnb firms (mean Total Assets €1.07–1.58 M) compared to traditional hotels, a structural difference that underpins the ROA superiority of the asset-light model. Moreover, Kruskal-Wallis tests (Table 6) reveal that star classification is not a systematic determinant of profitability: significant differences between 2–3★ and 4–5★ hotels emerge only during Capital Controls (NPM: $p = 0.026$) and Recovery 2017–19 (EBITDA: $p = 0.048$; NPM: $p = 0.036$), while all other sub-periods show no significant divergence. For the Hotels vs. Airbnb comparison, the Recovery sub-period yields the strongest signal (EBITDA: $p = 0.008$), whereas Covid-19 and the Energy Crisis show no significant differences across any indicator. Full results are reported in Table 6.

5.3 Hausman-Taylor estimation methodology

The Hausman-Taylor (HT) estimator (Hausman and Taylor, 1981) resolves the dilemma between fixed and random effects by using time-averaged values of the exogenous variables as internal instruments, allowing simultaneous control of endogeneity and estimation of time-invariant parameters. Multicollinearity diagnostics confirm the stability of the estimates: VIF tests (mean VIF: 2.08 and 2.53 respectively) and Spearman correlations (max $|r| = 0.46$) indicate no problematic collinearity among regressors (see Supplementary Material, Tables S1, S2, S3).

In the context of the empirical analysis, two models are estimated, each for three profitability dependent variables (ROA, EBITDA Margin, Net Profit Margin). First, by employing Model A, we examine the hotel industry (2–3★ and 4–5★) for the full twenty-year period 2005–2024:

$$Y_{i,t} = a + \beta_1 DebtRatio_{i,t} + \beta_2 LiqRatio_{i,t} + \beta_3 D_Crisis_t + \beta_4 D_CapCtrl_t + \beta_5 D_Recovery_t + \beta_6 D_Covid_t + \beta_7 D_Tourism_t + \beta_8 TourismGrowth_t + \gamma_1 Stars23_i + \delta_1 (Stars23_i * D_Covid_t) + \delta_2 (DebtRatio_{i,t} * D_Covid_t) + \mu_i + \varepsilon_{i,t}$$

where $Y \in \{ROA, EBITDA \text{ Margin}, NPM\}$, i = firm, t = year, μ_i = unobserved individual factor, $\varepsilon_{i,t}$ = idiosyncratic error.

Model B incorporates short-term rental firms to address the competitive dynamics between the traditional hotel model and the asset-light Airbnb model (2017–2024), a comparison that becomes empirically relevant only from 2017 when Airbnb achieves sufficient market presence in the sample:

$$Y_{i,t} = a + \beta_1 DebtRatio_{i,t} + \beta_2 LiqRatio_{i,t} + \beta_3 \ln(TA)_{i,t} + \beta_4 (DebtRatio_{i,t} * StarsAirbnb_i) + \beta_5 D_Covid_t + \beta_6 D_Tourism_t + \beta_7 TourismGrowth_t + \gamma_1 StarsAirbnb_i + \delta_1 (StarsAirbnb_i * D_Covid_t) + \delta_2 (StarsAirbnb_i * D_Tourism_t) + \delta_3 (DebtRatio_{i,t} * D_Covid_t) + \mu_i + \varepsilon_{i,t}$$

The inclusion of interaction terms serves a dual purpose. On the one hand, it allows for the control of the heterogeneous effect of crises by business category, and on the other hand, it

Table 5. Descriptive statistics by sub-period and hotel category – mean and standard deviation

Variable	Stat	Pre-crisis 2005–08		Financial Crisis 2009–14		Capital controls 2015–16		Recovery 2017–19		Airbnb	Covid-19 2020–21		Airbnb	Energy Crisis 2022–24		Airbnb
		2–3★	4–5★	2–3★	4–5★	2–3★	4–5★	2–3★	4–5★		2–3★	4–5★		2–3★	4–5★	
ROA	Mean	0.0150	0.0023	–0.0039	–0.0021	0.0116	0.0284	0.0263	0.0361	–0.0350	–0.0215	–0.0026	0.0170	0.0566	0.0664	0.1076
	(SD)	(0.0536)	(0.0979)	(0.0500)	(0.0661)	(0.0572)	(0.0792)	(0.0583)	(0.0561)	(0.3732)	(0.0849)	(0.0676)	(0.2796)	(0.0824)	(0.1115)	(0.2367)
EBITDA	Mean	0.2170	0.2403	0.2787	0.2185	0.3076	0.3136	0.1963	0.1719	0.1937 [†]	–0.8884	0.1084	0.2304	0.2572	0.4002	0.2904
Margin	(SD)	(0.3966)	(0.2577)	(0.2321)	(0.2865)	(0.2441)	(0.1997)	(0.5155)	(1.2736)	(0.4057)	(5.5751)	(0.6106)	(0.7127)	(0.3233)	(0.6414)	(0.3910)
Net Profit	Mean	–0.1438	–0.0503	–0.0887	–0.1217	–0.0540	0.0736	–0.0285	–0.0366	–0.0242	–1.5445	–0.6581	–0.0701	0.0823	0.2043	0.0535
Margin (ROS)	(SD)	(1.3481)	(0.3752)	(0.2401)	(0.4626)	(0.2533)	(0.2195)	(0.5963)	(1.1357)	(0.3702)	(6.8600)	(2.5502)	(0.7479)	(0.3037)	(0.6604)	(0.4618)
Debt Ratio	Mean	0.3998	0.5183	0.3861	0.5166	0.4463	0.4345	0.4288	0.4606	0.4612	0.5197	0.5458	0.5651	0.4281	0.4726	0.4899
	(SD)	(0.2433)	(0.2742)	(0.2468)	(0.2661)	(0.2562)	(0.2572)	(0.2633)	(0.2545)	(0.5263)	(0.2777)	(0.2615)	(0.4717)	(0.2587)	(0.2867)	(0.3730)
ln(Total Assets)	Mean	14.43	16.39	14.76	16.82	14.90	16.86	14.99	17.11	12.95	15.00	17.18	13.40	15.07	17.48	13.75
	(SD)	(1.019)	(1.742)	(0.986)	(1.710)	(1.053)	(1.841)	(1.137)	(1.759)	(1.683)	(1.188)	(1.738)	(1.281)	(1.184)	(1.689)	(1.143)
Total	Mean	3.22 M	37.00 M	4.53 M	57.98 M	5.27 M	72.22 M	6.17 M	88.10 M	1.07 M	6.54 M	98.16 M	1.30 M	7.16 M	129.02 M	1.58 M
Assets (€)	(SD)	(3.94 M)	(47.33 M)	(6.15 M)	(84.51 M)	(6.22 M)	(112.08 M)	(7.25 M)	(135.32 M)	(1.36 M)	(8.00 M)	(154.20 M)	(1.61 M)	(9.68 M)	(212.71 M)	(1.66 M)
Cost of	Mean	4.81 M	19.99 M	5.32 M	31.15 M	20.03 M	37.91 M	25.93 M	41.29 M	622.4 K	25.30 M	44.46 M	742.5 K	30.92 M	66.99 M	2.42 M
Goods Sold (€)	(SD)	(13.46 M)	(40.38 M)	(16.10 M)	(77.78 M)	(79.17 M)	(93.23 M)	(96.67 M)	(104.55 M)	(845.1 K)	(98.38 M)	(117.24 M)	(1.35 M)	(108.84 M)	(169.76 M)	(4.03 M)
Liquidity Ratio	Mean	2.786	4.408	3.855	2.786	5.711	3.183	1.449	4.140	2.084	–3.510	8.202	3.235	2.905	3.481	5.683
	(SD)	(5.845)	(30.436)	(11.552)	(4.143)	(13.695)	(3.321)	(12.102)	(16.569)	(2.530)	(32.235)	(27.802)	(5.557)	(6.646)	(7.687)	(9.691)

Note(s): Airbnb firms enter sample from 2017

Table 6. Kruskal-Wallis test *p*-values by sub-period

Sub-period	ROA	EBITDA margin	Net profit margin
<i>A. Comparison of Hotel Categories (2–3★ vs. 4–5★)</i>			
Pre-crisis 2005–08	0.517	0.831	0.747
Financial Crisis 2009–14	0.854	0.154	0.482
Capital Controls 2015–16	0.074*	0.325	0.026**
Recovery 2017–19	0.161	0.048**	0.036**
Covid-19 2020–21	0.235	0.259	0.765
Tourism Recovery and Energy Crisis 2022–24	0.486	0.169	0.183
<i>B. Hotels vs. Airbnb</i>			
Covid-19 2020–21	0.475	0.232	0.057*
Recovery 2017–19	0.125	0.008***	0.064*
Tourism Recovery and Energy Crisis 2022–24	0.532	0.119	0.100

Note(s): * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ | *Italic* = statistically significant at 5% level. Part B reported only for sub-periods where Airbnb firms are present in the sample

captures the reinforcing role of leverage in periods of shock, central assumptions of the PEST-DG theoretical framework.

5.4 Hausman-Taylor estimation results

5.4.1 Model A – hotels only. Addressing the [RQ1](#), [RQ2](#), [RQ3](#), Model A examines how crisis regimes and star classification interact with capital structure across the full twenty-year horizon. The results of Model A ([Table 7](#)) show the debt ratio as the dominant structural factor. Its effect is strongly negative on ROA (-0.098^{***}) and NPM (-0.372^{***}), but statistically irrelevant on EBITDA Margin. The negative relationship between leverage and firm-level profitability is consistent with [Dimitropoulos \(2018\)](#), who documented an equivalent pattern for the Greek hospitality sector during the sovereign debt crisis, though that study relied on OLS estimation and was limited to the 2011–2013 period, precluding the identification of

Table 7. Model A: Hausman-Taylor estimation results

Variable	ROA coef	ROA p-val	EBITDA margin coef	EBITDA Margin p-val	NPM coef	NPM p-val
Debt Ratio	-0.0980^{***}	0.000	-0.0628	0.236	-0.3724^{***}	0.000
Liquidity Ratio	-0.0001	0.190	0.0000	0.948	-0.0021^{**}	0.046
Financial Crisis	-0.0110^{**}	0.026	$+0.0041$	0.865	-0.0424	0.239
Capital Controls	$+0.0136^{**}$	0.041	$+0.0751^{**}$	0.022	$+0.0724$	0.136
Recovery 2017–19	$+0.0213^{***}$	0.000	$+0.0122$	0.666	$+0.0665$	0.113
Covid-19	-0.0318^{**}	0.016	-0.0889	0.181	-0.0129	0.896
Tourism Recovery	$+0.0323^{***}$	0.000	-0.0442	0.142	-0.0038	0.933
Tourism Growth (%)	$+0.0004^{***}$	0.000	$+0.0029^{***}$	0.000	$+0.0044^{***}$	0.000
Stars23 × Covid	-0.0133	0.214	-0.1448^{***}	0.007	-0.1301	0.101
Debt Ratio × Covid	$+0.0410^{**}$	0.038	-0.0911	0.357	-0.5354^{***}	0.000
Stars 2–3★	-0.0113	0.205	-0.0054	0.891	-0.0383	0.464
N (obs.)	1,118		1,110		1,110	
N (firms)	67		67		67	

Note(s): TV Endogenous: Debt Ratio, Liquidity Ratio | TI Exogenous: Stars23 | Reference period: Pre-crisis 2005–2008 | Reference category: 4–5★ hotels | * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

time-invariant effects that the present Hausman-Taylor specification recovers. This threefold distinction confirms the economic distress theory: leverage does not affect operating profitability, but the final pressure due to debt service costs. This finding is consistent with Kalash (2023), who documents an equivalent leverage penalty in the Turkish market, showing that the negative effect of financial leverage on performance intensifies significantly for firms already exposed to financial distress risk, a dynamic that mirrors the crisis-amplification mechanism identified here across the Greek hospitality sub-periods.

The central finding is the variable “Tourism Growth”, the only one with a statistically significant positive effect on all three dimensions: ROA (+0.0004***), EBITDA Margin (+0.0029***), and NPM (+0.0044***). This fact confirms that the main transmission mechanism is the quality of spending and not the number of arrivals, which reverses the conventional literature. At the same time, the period of capital controls (2015–2016) paradoxically shows a positive sign in ROA (+0.0136**) and EBITDA Margin (+0.0751**), confirming the mechanism of “forced rationalization”. Finally, the statistical insignificance of the Stars23 variable indicates that the star category is not an autonomous determinant of profitability but only acts through the interaction with crisis regimes (EBITDA Margin: 0.1448***).

The sub-period dummies confirm a symmetric crisis-recovery pattern: Financial Crisis and Covid-19 significantly reduce profitability, while Recovery 2017–19 and Tourism Recovery register equivalent rebounds, confirming that the market reacts predictably to macroeconomic cycles. The Stars23 × Covid interaction (EBITDA: −0.145***) reveals that economy hotels bore a disproportionate share of the pandemic shock, reflecting shallower financial buffers and lower cost flexibility relative to luxury units. Finally, Debt Ratio × Covid (NPM: −0.535***) confirms that leverage, manageable under normal conditions, becomes acutely destructive during crises amplifying profitability losses beyond the direct demand shock.

5.4.2 Model B – hotels vs airbnb. Model B provides the econometric answer to the RQ1, RQ2, RQ4, testing whether the asset-light model superiority survives controls for firm size and financial leverage. Model B (Table 8) shows the interaction between StarsAirbnb and Covid as the strongest finding, with positive and significant coefficients on ROA (+0.0497***), EBITDA (+0.2593***), and NPM (+0.4193***). The results are consistent with the platform resilience hypothesis, as the asset-light model allows for direct cost compression compared to capital-intensive hotels; however, as the Covid regime is specified as a composite

Table 8. Model B: Hausman-Taylor estimation results

Variable	ROA coef	ROA <i>p</i> -val	EBITDA coef	EBITDA <i>p</i> -val	NPM coef	NPM <i>p</i> -val
Debt Ratio	−0.0836**	0.015	−0.2091	0.108	−0.2588	0.165
Liquidity Ratio	+0.0003	0.152	−0.0002	0.852	−0.0015	0.310
ln(Total Assets)	−0.0371	0.000	+0.0409	0.234	+0.0399	0.419
Debt Ratio × StarsAirbnb	−0.1049**	0.026	+0.1759	0.374	+0.1506	0.600
Covid-19	−0.0127	0.344	−0.1268**	0.036	−0.1913**	0.031
Tourism Recovery	+0.0011	0.896	−0.0484	0.177	−0.0508	0.334
Tourism Growth (%)	+0.0005***	0.000	+0.0024***	0.000	+0.0037***	0.000
StarsAirbnb × Covid	+0.0497***	0.007	+0.2593***	0.002	+0.4193***	0.001
StarsAirbnb × Tourism Recovery	+0.0483***	0.005	+0.0666	0.394	+0.0551	0.630
Debt Ratio × Covid	−0.0546***	0.007	−0.1240	0.170	−0.4278***	0.001
StarsAirbnb	+0.1020**	0.025	+0.0892	0.568	+0.0896	0.691
N (obs.)	599		593		593	
N (firms)	86		86		86	

Note(s): TV Endogenous: Debt Ratio, Liquidity Ratio, ln(TA), Debt Ratio × StarsAirbnb | TI Exogenous: StarsAirbnb | Reference: all hotels combined | **p* < 0.10, ***p* < 0.05, ****p* < 0.01

geopolitical–social (G + S) shock, a concurrent social-channel account (the shift toward self-contained accommodation) cannot be separately identified by the interaction term. Airbnb’s structural superiority is also confirmed by the positive StarsAirbnb coefficient (+0.102** on ROA). However, the interaction between Debt Ratio and StarsAirbnb is negative (−0.1049** on ROA), suggesting that debt disproportionately hurts short-term rental companies; the lack of ownership increases financing costs, making profitability vulnerable to leverage. The model concludes by confirming TourismGrowth (***) as a universal transmission mechanism common to both categories.

The ln(Total Assets) coefficient (+0.037*** on ROA) confirms a size premium consistent with economies of scale. Covid-19 hits EBITDA (−0.127**) and NPM (−0.191**) but not ROA, suggesting the shock operated through cost rigidity rather than asset utilization. StarsAirbnb × Tourism Recovery (+0.048*** on ROA) confirms that the asset-light model captured a disproportionate share of the post-pandemic demand rebound, while Debt Ratio × Covid (NPM: −0.428***) replicates the Model A finding that leverage becomes destructive under crisis conditions.

6. Conclusions and implications

Figure 2 synthesizes the conceptual model of this study, linking the six PEST-DG macro-forces, through the volume–value transmission mechanism and the asset-heavy/asset-light distinction, to firm-level financial outcomes and their managerial, policy and investment implications.

This study has empirically demonstrated and validated the PEST-DG framework as a quantitative map linking exogenous systemic forces with business accounting data over the period 2005–2024. Through the Hausman-Taylor estimator applied to a twenty-year pan-Hellenic Greek hospitality industry, four research questions are examined (Table 9).

The first two research questions lead to the same crucial conclusion. The macro-environmental forces, analyzed through the PEST-DG framework, are the key determinants of business profitability, empirically confirming the “paradox of Mediterranean tourism”. The

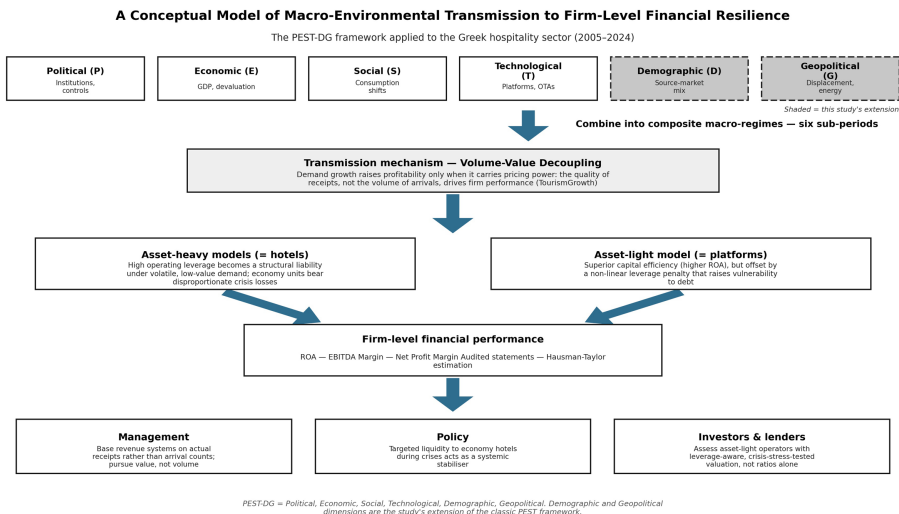


Figure 2. Conceptual model of macro-environmental transmission to firm-level financial resilience in the Greek hospitality sector (2005–2024), based on the extended PEST-DG framework

Table 9. Research questions: Summary of empirical evidence

RQ	Research question	Key finding	Model A	Model B	Outcome
RQ1	How do PEST-DG macro-environmental forces determine the financial performance of Greek hospitality firms (2005–2024)?	TourismGrowth (%) is the only variable significant across all three profitability dimensions, confirming quality of spend (not volume) as the primary transmission mechanism	✓	✓	Confirmed
RQ2	Is the “Mediterranean Tourism Paradox” empirically evident at firm-level balance sheets?	Rising arrivals consistently fail to translate into firm-level profitability. Revenue per arrival compressed from €739 (Pre-crisis) to €530 (Capital Controls) and never recovered, while internal devaluation masked structural weakness	✓	✓	Confirmed
RQ3	How do star classification and capital structure influence profitability, and does this relationship shift during economic crises?	Star category is not an autonomous profitability driver under normal conditions. It becomes significant only in crisis: Stars23 × Covid (EBITDA: -0.145^{***}) shows economy hotels bore disproportionate pandemic losses. Debt Ratio × Covid (NPM: -0.535^{***}) confirms leverage becomes destructive in downturns	✓	—	Partially confirmed
RQ4	Do asset-light business models consistently outperform traditional hotel structures when controlling for size and leverage?	Airbnb shows structural ROA superiority (StarsAirbnb: $+0.102^{**}$) and crisis resilience (Airbnb × Covid: ROA $+0.050^{***}$, EBITDA $+0.259^{***}$). However, Debt Ratio × Airbnb (-0.105^{**} on ROA) reveals leverage is disproportionately costly for asset-light firms	—	✓	Confirmed with caveats

Notes(s): ✓ = addressed and confirmed by the model; — = not addressed by this model, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Model A: hotel-only sample (2005–2024, $N = 1,118$); Model B: hotels vs. Airbnb (2017–2024, $N = 599$). Reference period: Pre-crisis 2005–2008

increase in tourist arrivals does not automatically imply profitability. Acting together as a composite macro-regime rather than as separately identified forces, the geopolitical shift in demand, the internal devaluation and the growth of world tourism help account for why rising occupancy is systematically accompanied by increasingly smaller profit margins. The political implications are clear, since the model of “growth based on figures” seems to have reached its end. The change towards the expenditure per capita should replace the volume of visitors as the central objective, which requires a qualitative improvement of the product instead of a simple increase in capacity. For managers, income management systems should focus on real income and not on the number of tourists, since only the first ones reflect the true financial performance at the end of the fiscal year.

Star ratings, which are the focus of [RQ3](#), have proven to have little impact on performance under normal market conditions. However, their importance becomes critical during times of crisis. Lower-category hotels suffer disproportionate operating losses precisely when the environment becomes more adverse, increasing their vulnerability. Therefore, providing targeted liquidity to these units during economic disruptions is not simply a subsidy, but rather acts as a systemic stabilizer. For lenders and the investment community, risk assessments in the hotel sector should be stress-tested under hypothetical crisis scenarios, rather than relying solely on typical steady-state conditions.

The asset-light model, examined in [RQ4](#), reveals clear structural advantages in terms of capital efficiency and resilience during times of crisis. Short-term rental companies invest less capital to achieve the same return, an advantage that is amplified when traditional hotels have the greatest exposure. However, this approach is not foolproof. The lack of equity assets to serve as collateral makes any additional borrowing disproportionately burdensome. Valuing these companies solely based on performance ratios masks a considerable sensitivity to leverage, which the market and regulators should not underestimate.

As a methodological contribution, this paper constitutes the first application of the Hausman-Taylor estimator to the financial performance of hotels in the Mediterranean and the first controlled comparison between traditional hospitality and digital platforms, made possible by Law 4472/2017. Limitations include the inability to capture informal accommodation and possible survivorship bias, while future research should extend the PEST-DG framework to comparative Mediterranean destinations such as Spain, Portugal and Croatia, where [Lazarević and Stanišić \(2023\)](#) document analogous crisis-driven demand asymmetries in order to validate the cross-national generalizability of these findings.

To return to the Aristotelian prudence introduced in the introduction, the ability to discern behind economic numbers the macro-force that created them is not just a theoretical virtue but a measured competitive advantage. A balance sheet that withstands successive shocks is not accidental – it is the imprint of a timely recognition of how macro-forces are embedded in each specific reality.

Supplementary material

Table A1. Variance Inflation Factors (VIF) for Models A and B. Critical limit: VIF >10. Mean VIF: 2.08 (Model A), 2.53 (Model B)

Model A Variable	VIF	Model B Variable	VIF
d_covid	5.10	stars_airbnb	4.62
inter_dr_covid	4.15	inter_dr_covid_b	4.38
d_crisis	2.16	d_covid	4.29
d_tourism	2.04	inter_dr_airbnb	3.12
d_recovery	1.85	inter_airbnb_tourism	2.62
inter_23_covid	1.57	inter_airbnb_covid	2.28
d_capctrl	1.46	debt_ratio	1.51
debt_ratio	1.23	d_tourism	1.50
stars_23	1.17	ln_ta	1.30
tourism_growth	1.17	tourism_growth	1.17
liq_ratio	1.02	liq_ratio	1.01

Table A2. Spearman rank correlations – Model A. Cells with $|r| > 0.40$ are highlighted. Maximum correlation: 0.460 (d_tourism and tourism_growth) - structurally expected, below the critical threshold of 0.70

	debt_ratio	liq_ratio	tourism_gr	d_crisis	d_capctrl	d_recovery	d_covid	d_tourism	stars_23
debt_ratio	1.000	-0.177	0.002	-0.006	-0.050	-0.041	0.094	-0.004	-0.097
liq_ratio	-0.177	1.000	0.032	-0.032	0.024	-0.003	0.029	0.065	-0.075
tourism_gr	0.002	0.032	1.000	-0.235	-0.157	0.033	-0.029	0.460	-0.050
d_crisis	-0.006	-0.032	-0.235	1.000	-0.196	-0.295	-0.246	-0.299	0.061
d_capctrl	-0.050	0.024	-0.157	-0.196	1.000	-0.140	-0.117	-0.142	0.014
d_recovery	-0.041	-0.003	0.033	-0.295	-0.140	1.000	-0.176	-0.214	-0.042
d_covid	0.094	0.029	-0.029	-0.246	-0.117	-0.176	1.000	-0.179	-0.042
d_tourism	-0.004	0.065	0.460	-0.299	-0.142	-0.214	-0.179	1.000	-0.071
stars_23	-0.097	-0.075	-0.050	0.061	0.014	-0.042	-0.042	-0.071	1.000

Table A3. Spearman rank correlations – Model B. Maximum: 0.460 (d_tourism and tourism_growth). ln_ta and stars_airbnb = -0.401: reflects Airbnb's structurally smaller capital base – theoretically consistent

	debt_ratio	liq_ratio	ln_ta	tourism_gr	d_covid	d_tourism	stars_airbnb
debt_ratio	1.000	-0.177	0.162	0.002	0.094	-0.004	-0.010
liq_ratio	-0.177	1.000	-0.042	0.032	0.029	0.065	0.002
ln_ta	0.162	-0.042	1.000	-0.006	-0.032	0.022	-0.401
tourism_gr	0.002	0.032	-0.006	1.000	-0.029	0.460	0.143
d_covid	0.094	0.029	-0.032	-0.029	1.000	-0.179	0.164
d_tourism	-0.004	0.065	0.022	0.460	-0.179	1.000	0.200
stars_airbnb	-0.010	0.002	-0.401	0.143	0.164	0.200	1.000

References

- Chen, M.H. (2011), "The response of hotel performance to international tourism development and crisis events", *International Journal of Hospitality Management*, Vol. 30 No. 1, pp. 200-212, doi: [10.1016/j.ijhm.2010.06.005](https://doi.org/10.1016/j.ijhm.2010.06.005).
- Cró, S. and Martins, A.M. (2017), "Structural breaks in international tourism demand: are they caused by crises or disasters?", *Tourism Management*, Vol. 63, pp. 3-9, doi: [10.1016/j.tourman.2017.05.009](https://doi.org/10.1016/j.tourman.2017.05.009).
- Dimitrić, M., Tomas Žiković, I. and Filipović, S. (2019), "Profitability determinants of hotel companies in selected Mediterranean countries", *Economic Research-Ekonomska Istraživanja*, Vol. 32 No. 1, pp. 3104-3126.
- Dimitropoulos, P. (2018), "Profitability determinants of the Greek hospitality industry: the crisis effect", in Katsoni, V. and Velandar, K. (Eds), *Innovative Approaches to Tourism and Leisure*, Springer, Cham, pp. 405-416.
- Dogru, T. and Sirakaya-Turk, E. (2018), "Determinants of hotel performance: seasonality and macroeconomic factors", *Tourism Analysis*, Vol. 23 No. 2, pp. 229-241.
- Dogru, T., Mody, M., Suess, C., McGinley, S. and Line, N.D. (2020), "The Airbnb paradox", *Tourism Management*, Vol. 77, 104001.
- Elshaer, I.A. and Saad, S.K. (2022), "Entrepreneurial resilience and business continuity in the tourism and hospitality industry: the role of adaptive performance and institutional orientation", *Tourism Review*, Vol. 77 No. 5, pp. 1365-1384, doi: [10.1108/tr-04-2021-0171](https://doi.org/10.1108/tr-04-2021-0171).
- Guttentag, D., Smith, S., Potwarka, L. and Havitz, M. (2018), "Why tourists choose Airbnb: a motivation-based segmentation study", *Journal of Travel Research*, Vol. 57 No. 3, pp. 342-359, doi: [10.1177/0047287517696980](https://doi.org/10.1177/0047287517696980).

- Hausman, J.A. and Taylor, W.E. (1981), "Panel data and unobservable individual effects", *Econometrica*, Vol. 49 No. 6, pp. 1377-1398, doi: [10.2307/1911406](https://doi.org/10.2307/1911406).
- Hondroyannis, G. and Papaioikonomou, D. (2017), "The effect of card payments on VAT revenue: new evidence from Greece", *Economics Letters*, Vol. 157, pp. 17-20, doi: [10.1016/j.econlet.2017.05.009](https://doi.org/10.1016/j.econlet.2017.05.009).
- INSETE Intelligence (2024), "Statistical bulletin: developments in the Greek tourism market", available at: <https://insete.gr/intelligence/> (accessed 15 January 2026).
- Johnson, G. and Scholes, K. (1999), *Exploring Corporate Strategy*, 5th ed., Prentice Hall, London.
- Kalash, I. (2023), "The financial leverage–financial performance relationship in the emerging market of Turkey: the role of financial distress risk and currency crisis", *EuroMed Journal of Business*, Vol. 18 No. 1, pp. 1-20, doi: [10.1108/EMJB-04-2021-0056](https://doi.org/10.1108/EMJB-04-2021-0056).
- Lazarević, S. and Stanišić, T. (2023), "The impact of global crises on international tourism in the Southern and Mediterranean Europe", *Hotel and Tourism Management*, Vol. 11 No. 2, pp. 103-115, doi: [10.5937/menhottur2302103l](https://doi.org/10.5937/menhottur2302103l).
- Magoutas, A., Papadoudis, G. and Sfakianakis, G. (2016), "The financial performance of Greek hotels before and during the crisis", *Journal of Investment and Management*, Vol. 5 No. 6, pp. 189-192.
- Mucharreira, P.R., Antunes, M.G., Justino, M.R.F. and Texeira-Quirós, J. (2019), "Macroeconomic determinants relevance in corporate financial performance", *Investment Management and Financial Innovations*, Vol. 16 No. 3, pp. 1-11.
- Nouraldeem, R.M. (2025), "The financial performance of Lebanese banks up to the financial crisis: do audit committee characteristics and ownership concentration matter?", *EuroMed Journal of Business*, Vol. 20 No. 3, pp. 654-668, doi: [10.1108/emjb-07-2023-0199](https://doi.org/10.1108/emjb-07-2023-0199).
- Okumus, F. (2004), "Potential challenges of employing a formal environmental scanning approach in hospitality organizations", *International Journal of Hospitality Management*, Vol. 23 No. 2, pp. 123-143, doi: [10.1016/j.ijhm.2003.09.002](https://doi.org/10.1016/j.ijhm.2003.09.002).
- Papatheodorou, A., Rosselló, J. and Xiao, H. (2010), "Global economic crisis and tourism: consequences and perspectives", *Journal of Travel Research*, Vol. 49 No. 1, pp. 39-45, doi: [10.1177/0047287509355327](https://doi.org/10.1177/0047287509355327).
- Prayag, G., Chowdhury, M., Spector, S. and Orchiston, C. (2018), "Organizational resilience and financial performance", *Annals of Tourism Research*, Vol. 73, pp. 193-196, doi: [10.1016/j.annals.2018.06.006](https://doi.org/10.1016/j.annals.2018.06.006).
- Rompotis, G. (2024/2025), "Cash flow management, performance and risk: evidence from Greece", *EuroMed Journal of Business*, Vol. 20 No. 3, pp. 595-627, doi: [10.1108/EMJB-09-2023-0245](https://doi.org/10.1108/EMJB-09-2023-0245).
- Sakellarios, N., Duarte Alonso, A., Vu, O.T.K., O'Brien, S., Kok, S. and Velasquez, S. (2025), "Exploring the gender entrepreneurial dimension following a long-term crisis: the case of Cypriot and Greek micro and small firms", *EuroMed Journal of Business*, Vol. 20 No. 3, pp. 628-653, doi: [10.1108/emjb-08-2023-0215](https://doi.org/10.1108/emjb-08-2023-0215).
- Smeral, E. (2012), "International tourism demand and the business cycle", *Annals of Tourism Research*, Vol. 39 No. 1, pp. 379-400, doi: [10.1016/j.annals.2011.07.015](https://doi.org/10.1016/j.annals.2011.07.015).
- Zervas, G., Proserpio, D. and Byers, J.W. (2017), "The rise of the sharing economy: estimating the impact of Airbnb on the hotel industry", *Journal of Marketing Research*, Vol. 54 No. 5, pp. 687-705, doi: [10.1509/jmr.15.0204](https://doi.org/10.1509/jmr.15.0204).

Further reading

- Bank of Greece (2024), "Developments in the balance of travel services", available at: <https://www.bankofgreece.gr/en/statistics/external-sector/balance-of-payments/travel-services> (accessed 23 March 2026).
- Candeias Fernandes, A.J. and Franco, M. (2022), "The role of entrepreneurial resilience in forms of collaboration: a systematic literature review with bibliometric analyses", *EuroMed Journal of Business*, Vol. 17 No. 4, pp. 752-789, doi: [10.1108/emjb-05-2021-0075](https://doi.org/10.1108/emjb-05-2021-0075).

-
- Eurostat (2024), “Unemployment by sex and age - monthly data”, available at: https://ec.europa.eu/eurostat/databrowser/view/une_rt_m/default/table (accessed 13 February 2026).
- Hellenic Statistical Authority (ELSTAT) (2024), “Consumer price index (CPI): March 2024”, available at: <https://www.statistics.gr/documents/20181/f278dc3c-ac00-da81-ac5e-778ca5a30e3a> (accessed 10 February 2026).
- Law 4472/2017 (Government Gazette A' 74) (2017), *Article 84: Short-Term Accommodation Property Registry*, National Printing House, Athens.
- World Bank (2024), “GDP (current US\$) - Greece”, available at: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=GR> (accessed 25 January 2026).

Corresponding author

Maria Kalogera can be contacted at: kalogera@upatras.gr