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Abstract

Tourism is a contemporary social as well as economic phenomenon, being one of the main sectors, with a continuous impact on the local economy and society of each tourist destination. The economic value of tourism lies in the creation of jobs and income, the implementation of investments for infrastructure development, and its contribution to national taxes. In Greece, the majority of tourist traffic is mainly distributed among the three regions of Crete, the Ionian Islands, and the South Aegean. This paper examines the supply and demand of the Greek tourism product with a focus on the island of Santorini, which is an internationally renowned destination of the South Aegean. The study contributes to the literature on island destinations by providing a comprehensive, post-pandemic assessment of tourism demand and supply dynamics, highlighting structural pressures related to overtourism, seasonality, and destination resilience. The research relies on official and recently published statistical data from the Bank of Greece, the Hellenic Statistical Authority, the Hotel Chamber, and other reliable sources. By systematically linking empirical indicators with destination management challenges, the study offers policy-relevant insights for sustainable tourism planning in high-pressure island destinations. Through this study, useful conclusions are drawn for the island of Santorini, which help in addressing the challenges in managing the destination, based on close cooperation with all interested parties.

JEL Classifications: L83, R11, Z32

Keywords: Santorini, tourism product, tourist demand, tourist supply

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1. Introduction

Santorini or Thira is an island located in the southern Aegean Sea, in the Cyclades island group. It is 128 nautical miles from Piraeus and 63 nautical miles from Crete. In fact, it is an island complex consisting of five islands. Santorini is the largest of these, covering 76.2 square kilometres along with Therasia, Aspronisi and the two volcanic islands, Palea and Nea Kameni, which were formed after a series of volcanic eruptions in the area. All are remnants of the prehistoric island of Strongyli around a large oval basin (caldera) formed by the sinking of the centre due to the volcanic eruption. The capital of Santorini is Fira.

Santorini is one of the most popular tourist destinations worldwide. Every year thousands of visitors from all over the world arrive on the island to enjoy natural beauty and beaches. Besides these, visitors have the opportunity to see archaeological sites, museums, houses built into the rock, unique beaches, wineries and beautiful Cycladic churches and chapels. The greatest attraction of Santorini is its volcano and its sunset, which is one of the most enchanting in the world.

The economic life of Santorini before 1960, when tourism gradually began, relied on agriculture and trade. Today, the island's economy is based on agriculture, fishing, manufacturing, services, and infrastructure - construction. These sectors support the island's main economic sector, tourism. Various forms of alternative tourism, such as gastronomic tourism, sports tourism (hiking, climbing, etc.), conference tourism, wellness, and wedding tourism are developing on the island of Santorini. However, the development of tourism has shifted the focus of the economy to activities related to tourism, resulting in a contraction of the primary sector. Examining the population composition by gender, it is noted that of the total permanent population in 2021 (15,480 people), men accounted for 50.4% (7,802 people) and women accounted for 49.6% of the population (7,678) (ELSTAT, 2023).

The tourist season in Santorini starts in April and ends in late October, when many shops, restaurants and hotels close. In winter, only a few hotels and restaurants remain open to visitors. According to Papalexi (2009), Santorini cannot develop winter tourism due to weather conditions (strong winds prohibit travel), making it difficult for foreigners to stay on the island.

In Santorini arrivals take place by air and sea. Santorini's airport is international and serves a large and growing number of travellers, both with domestic and international flights (charters). Regarding shipping, Santorini receives a large number of passenger ships, cruise ships and leisure boats at Athinios, the island's largest port, and at the old port of Fira.

Tourism contributes both to the island's economy and to its social development. From an economic perspective, the impact of tourism in Santorini includes an increase in business income, improvement of social services, development of its less developed areas, upgrading of infrastructure, encouragement of entrepreneurial activity, increase in employment, and enhancement of residents' living standards. The social impacts of tourism include the modernisation of the local community, the protection and renovation of heritage buildings, and the revival of arts, customs, traditions, and local events. Tourism also has positive effects on the natural environment, the protection of natural areas, and the replacement, protection, and adaptation of old buildings for new uses (Kilipiris, 2006). Additionally, several areas of Santorini have been designated as protected areas, such as the little islands of Nea and Palaia Kameni (Natura, 2000) that are recorded no habitats, and the community of Oia has been designated as a traditional settlement (building restrictions in this settlement).

In Santorini, there is problem with the lack of the necessary water resources and the quality of groundwater. Given the island's tourism development, as well as the qualitative upgrading of tourism, water needs, especially during the summer months, are very high. The municipality has built a desalination plant with a capacity of 5,000 m3/day.

Despite the economic importance and international visibility of Santorini, existing academic research has primarily examined isolated dimensions of tourism development, such as overtourism pressures, spatial transformations, or accommodation patterns, without providing an integrated empirical assessment of both tourism demand and supply. Moreover, limited attention has been paid to the post-COVID-19 recovery phase using official statistical indicators at the destination level. This gap in the literature motivates the present study.

This study constitutes a quantitative analysis of the demand and supply of Santorini’s tourism product, based on official statistical data for the period 2019–2023. By adopting an integrated destination-level approach, the study responds to current academic debates on overtourism, destination resilience, and sustainable tourism development in island destinations. Moreover, the analysis links empirical tourism indicators with structural challenges related to seasonality, congestion, infrastructure capacity, and resource management.

The originality of this paper lies in its combined and systematic examination of tourism demand and supply for the island of Santorini over the period 2019–2023, capturing the effects of the COVID-19 pandemic and the subsequent recovery. By jointly analysing arrivals, overnight stays, length of stay, cultural visitation, hotel capacity, employment, and investment, the study contributes to the literature on island destinations and provides policy-relevant insights for sustainable tourism management under conditions of high tourism pressure.

The remainder of the paper is structured as follows. Section 2 reviews the relevant literature on island tourism, overtourism, and tourism development in Santorini. Section 3 presents the research questions guiding the study and outlines the methodology and data sources. Section 4 presents and discusses the empirical results regarding tourism demand and supply. Finally, Section 5 concludes with policy implications and directions for future research.

2. Literature Review

Tourism development in island destinations has been widely examined in academic literature, particularly in relation to issues of seasonality, carrying capacity, and sustainability. Island destinations often experience intensified tourism pressures, leading to congestion, environmental stress, and challenges for local communities (Butler, 1980; UNWTO, 2018). In this context, the concept of overtourism has emerged to describe situations in which tourism growth negatively affects residents' quality of life and destination identity.

Several studies focus explicitly on Santorini as a paradigmatic case of overtourism. Sarantakou and Terkenli (2019) analyse the impacts of non-institutionalised tourism accommodation on the island's landscape, highlighting spatial transformations and land-use pressures. More recently, Leka et al. (2025) propose a methodological framework for assessing overtourism in insular destinations and apply it to Santorini, concluding that the island faces severe structural pressures related to tourism intensity, spatial concentration, and infrastructure capacity. Additional research examines residents' perceptions of tourism impacts, revealing a tension between economic benefits and social costs. In addition, Leka, Vlachos and Papageorgiou (2023) analyse residents' perceptions of overtourism in Santorini, emphasizing the social and infrastructural pressures associated with high tourism intensity. They find that while tourism contributes significantly to the local economy, it also affects residents' daily life, accessibility, and social cohesion. Similarly, Sarantakou and Terkenli (2018) examine the relationship between tourism development and landscape transformation in Santorini, highlighting how spatial concentration and tourism density generate environmental and infrastructural challenges. Together, these studies reinforce the need for integrated quantitative analyses that link tourism demand and supply with social sustainability considerations.

Cruise tourism has also been identified as a critical component of tourism development in Greek island destinations. Kasimati, Dionysopoulou and Doulgeraki (2019) examine the cruise industry in Greece, highlighting growth prospects alongside challenges related to port capacity, congestion, and local impacts. Although their analysis is conducted at the national level, Santorini is identified as one of the country's leading cruise destinations, reinforcing concerns regarding visitor concentration and infrastructure pressure in island contexts.

Despite these contributions, the existing literature largely focuses on qualitative assessments or single-dimension analyses of tourism development. Empirical studies that jointly examine tourism demand and supply indicators using official statistical data at the destination level remain limited. Furthermore, post-pandemic analyses capturing the recovery phase of tourism activity are still emerging. This study addresses these gaps by providing an integrated, quantitative assessment of Santorini’s tourism product and by linking empirical findings to destination management challenges.

3. Research questions and methodological approach

Based on the literature review and the identified research gaps, this study is guided by the following research questions:

RQ1: How has tourism demand (domestic and inbound) in Santorini evolved during the period 2019–2023, particularly in response to the COVID-19 pandemic and the subsequent recovery?

RQ2: How has the supply of the tourism product changed over the same period?

RQ3: What empirical evidence emerges regarding structural pressures and sustainability challenges in Santorini as a mature island destination?

The study adopts a quantitative, descriptive research design based on secondary data obtained from official and reliable sources. Data were collected from the Hellenic Statistical Authority (ELSTAT), the Bank of Greece, the Hellenic Civil Aviation Authority (HCAA), the Hellenic Chamber of Hotels, INSETE, and ELIME. The dataset includes annual indicators on tourism demand and supply for the period 2019–2023.

The analysis focuses on arrivals, overnight stays, average length of stay, air and sea passenger traffic, cruise activity, hotel capacity, short-term rental accommodation, employment, and hotel investments. Descriptive statistical techniques were applied to examine trends, percentage changes, and comparative shares. Data processing and analysis were conducted using Microsoft tools. The methodological approach allows for a comprehensive depiction of tourism dynamics while supporting policy-oriented interpretation.

4. Results and Findings

4.1 The demand for Santorini's tourism product

This section presents data on domestic and incoming tourism in Santorini. The aim is to depict the pattern of demand for Santorini's tourism product or for the Regional Unit (R.U.) of Thira[i] (depending on the availability of statistical data) during the five-year period 2019-2023 and to examine whether there is a recovery in tourism demand following the pandemic crisis (Kasimati, Kondelis & Lagopoulos, 2020;2021). In line with recent international literature on post-pandemic tourism recovery and destination resilience, the analysis focuses on changes in volume, structure, and spatial concentration of demand rather than solely on aggregate growth.

4.1.1 Domestic tourism

Domestic arrivals at hotel accommodations in the Regional Unit of Thira during the period 2019-2023 recorded an increase of 5% (from 74 thousand in 2019 to 77 thousand in 2023). Regarding the percentage distribution for 2023 in the Cyclades, it is observed that the largest volume of domestic arrivals is recorded at hotel accommodations in the Regional Unit of Thira (22%), Mykonos (15%) and Syros and Paros (12%). The Regional Unit of Thira accounted for 21% of domestic overnight stays recorded in the Cyclades in 2023. During the period 2019-2023, the Regional Unit of Thira recorded an increase in overnight stays of 7% (from 187 thousand in 2019 to 199 thousand in 2023). The average length of stay of domestic travellers in the Regional Unit of Thira increased during the period 2019-2022 from 2.5 days to 2.7 days but decreased to 2.6 days in 2023.

Table 1: Arrivals, overnight stays & average length of stay of domestic visitors in hotel accommodations, 2019-2023

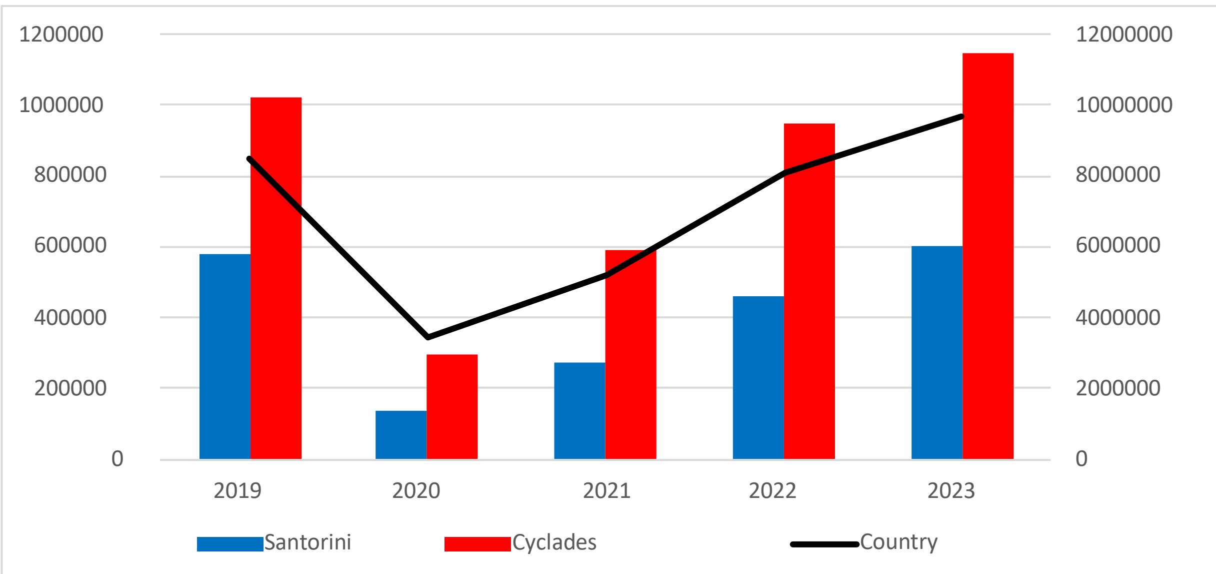
		2019	2020	2021	2022	2023
Regional Unit of Thira	Domestic arrivals	74,010	27,198	36,365	63,790	77,374
	Domestic overnight stays	186,617	77,949	112,964	172,191	199,271
	Average length of stay	2.5		3.1	2.7	2.6
Cyclades	**Domestic arrivals**	**339,073**	**160,347**	**196,149**	**313,183**	**355,712**
	Domestic overnight stays	**911,690**	**494,588**	**599,027**	**873,989**	**967,322**
	Average length of stay	**2.7**		**3.1**	**2.8**	**2.7**

Source: ELSTAT (2024a), Authors' calculations

In 2022, Santorini Airport[ii] welcomed 79% of domestic traffic recorded in 2019, marking a 21% decrease during the period 2019-2022 (from 578 thousand in 2019 to 459 thousand in 2022) due to the pandemic crisis. In 2023, Santorini Airport recovered the losses recorded in domestic air arrivals during 2020-2022.

According to Chart 1, during the period 2019-2023, domestic air arrivals in Santorini increased by 4% (from 578 thousand in 2019 to 602 thousand in 2023), compared to the second Cycladic airport of Mykonos, which recorded 262 thousand domestic arrivals. Regarding the percentage distribution for 2023 in the Cyclades, it is observed that the highest share is held by Santorini Airport (48%), followed by Mykonos Airport (25%), Paros (15%), Naxos (6%), Milos (5%) and Syros (1%).

Chart 1: Domestic passenger arrivals at Santorini airport, 2019-2023



Source: HCAA (2024), Authors' calculations

Table 2 records the handled domestic passengers (boarding and disembarkation with Passenger-Ferry (P/F) ships) from Athinios, the port of Santorini[iii]. In 2023, Santorini represented a 14% of domestic passenger traffic in the Cyclades, holding the second highest percentage after Paros (17%). During the period 2019-2023, domestic passenger traffic at the port of Santorini recorded a double-digit decline of 20% (from 2.2 million in 2019 to 1.7 million in 2023).

Table 2: Domestic traffic at Santorini port, 2019-2023

		DEPARTING PASSENGERS (ARRIVALS)	DEPARTING PASSENGERS (DEPARTURES)	TOTAL PASSENGERS
YEAR	**PORT**	**PASSENGERS WITH P/C - F/C**	**PASSENGERS WITH P/C - F/C**	**PASSENGERS WITH P/C - F/C**
2023	Santorini	885,816	815,346	1,701,162

	Cyclades	**6,267,244**	**6,148,435**	**12,415,679**
2022	Santorini	814,999	764,711	1,579,710
	Cyclades	**6,029,465**	**5,947,003**	**11,976,468**
2021	Santorini	529,859	513,864	1,043,723
	Cyclades	**4,390,251**	**4,352,522**	**8,742,773**
2020	Santorini	252,437	239,197	491,634
	Cyclades	**2,524,091**	**2,459,104**	**4,983,195**
2019	Santorini	1,088,552	1,029,388	2,117,940
	Cyclades	**6,130,776**	**6,024,629**	**12,155,405**

Source: ELSTAT (2024b), Authors' calculations

4.1.2 Inbound Tourism

Arrivals of foreigners at hotel accommodations in the Regional Unit of Thira during the period 2019-2023 recorded an increase of 14% (from 632 thousand in 2019 to 720 thousand in 2023). Regarding the percentage distribution for 2023 in the Cyclades, it is observed that the largest volume of arrivals is recorded at hotel accommodations in the Regional Unit of Thira (43%), Mykonos (36%) and Paros (9%). The Regional Unit of Thira accounted for 39% of overnight stays recorded in the Cyclades in 2023. During the period 2019-2023, the Regional Unit of Thira recorded an increase in overnight stays of 15% (from 1.9 million in 2019 to 2.2 million in 2023). The average length of stay of foreign visitors in the Regional Unit of Thira remained unchanged during 2019-2023 at 3 days.

Table 3: Arrivals, overnight stays & average length of stay of foreigners in hotel accommodations, 2019-2023

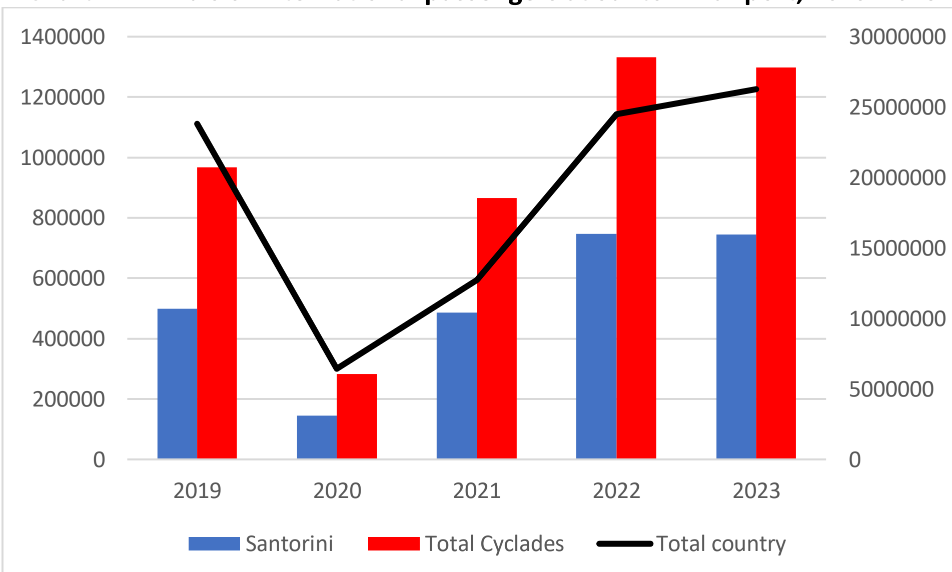
		2019	2020	2021	2022	2023
Regional Unit	Arrivals of foreigners	631,537	116,554	271,180	608,721	719,794
	Overnight stays of foreigners	1,889,481	429,326	955,672	1,817,144	2,165,283
	Average length of stay	3.0		3.5	3.0	3.0
Cyclades	**Arrivals of foreigners**	**1,529,882**	**281,880**	**695,596**	**1,441,161**	**1,678,282**
	Overnight stays of foreigners	**5,103,374**	**1,071,403**	**2,532,198**	**4,884,205**	**5,613,128**
	Average length of stay	**3.3**		**3.6**	**3.4**	**3.3**

Source: ELSTAT (2024a), Authors' calculations

In 2021, after one and a half years of the pandemic, Santorini welcomed 97% of the international air arrivals of 2019, while in 2022 and 2023 it recovered the losses recorded in air arrivals in 2020. Specifically, according to Chart 2 during the period 2019-2023, international air arrivals in Santorini increased by 49%

(from 499 thousands in 2019 to 744 thousands in 2023), compared to the second Cycladic airport of Mykonos where 546 thousand international arrivals were recorded. Regarding the percentage distribution for 2023 in the Cyclades, it is observed that the highest share belongs to Santorini airport (57%), followed by Mykonos airport (42%) and Paros (0.2%). The airports of Syros, Naxos and Milos did not record international traffic for 2023.

Chart 2: Arrivals of international passengers at Santorini airport, 2019-2023



Source: HCAA (2024), Authors' calculations

Santorini has traditionally been one of the most important cruise destinations in the country as well as in the Southeastern Mediterranean (Kasimati, Dionysopoulou & Doulgeraki, 2019) with a particularly high number of visitors and vessels that fluctuates depending on the external factors that determine developments in the sector. Cruise ships are docked at the old port of Fira. In 2023, 1,268,968 people arrived at the port of Santorini, making it the second port in terms of cruise ship arrivals after the port of Piraeus (see Table 4). Regarding the percentage distribution of cruise ship traffic in the ports of the Cyclades for 2023, it is noted that the highest percentage is recorded at the port of Santorini (45%). The same applies to the percentage distribution of cruise passenger arrivals, with Santorini's share standing at 53%.

Table 4: Cruise ship and cruise passenger traffic at the port of Santorini, 2019-2023

Port	2019	2020	2021	2022	2023

Santorini	Number of Cruise Ships	592	3	191	686	800
	Number of Arrivals	980771	131	104074	826602	1298968
Cyclades	**Number of Cruise Ships**	**1316**	**35**	**537**	**1523**	**1838**
	Number of Arrivals	**1827175**	**1976**	**321126**	**1552275**	**2564488**
Country	**Number of Cruise Ships**	**3979**	**210**	**2064**	**4780**	**5230**
	Number of Arrivals	**5552384**	**67528**	**1418315**	**4629650**	**7003150**

Source: ELIME (2024), Authors' calculations

The cultural potential of Santorini is composed of archaeological sites and museums, religious monuments (temples, monasteries, chapels), notable residential complexes, and more. From this cultural heritage of Santorini, the most important are (i) the Archaeological Museum of Thira, which houses collections of sculptures and inscriptions from the archaic to the Roman era as well as ceramics and terracotta figurines from the geometric to the Hellenistic period, (ii) the Prehistoric Museum of Thira, which hosts findings from Akrotiri and various sites of Thira, and (iii) the prehistoric city of Ancient Thira, which is one of the most significant centre of the Aegean in prehistoric times, with prehistoric settlements dating from the Late Neolithic Period.

Table 5: Visitors of museums and archaeological sites in Santorini, 2019-2023

	2019	2020	2021	2022	2023
MUSEUMS					
Santorini	***64927***	***12433***	***26861***	***57782***	***59877***
New Thira	52139	9481	26810	57613	59523
Old Thira	11198	2703	0	0	0
Collection of Thira's icons and relics	1590	249	51	169	354
Total Cyclades	**154975**	**33135**	**76852**	**138595**	**126848**
Total Country	**5895927**	**1100904**	**2047481**	**4636901**	**5782202**
ARCHAEOLOGICAL SITES					
Santorini	***335609***	***54836***	***162554***	***289107***	***315073***
Akrotiri of Thira	292356	41846	129292	247381	278287

Ancient Thira	43253	12990	33262	41726	36786
Cyclades	**596265**	**96518**	**301923**	**545186**	**597110**
Country	**13663351**	**2671924**	**5309545**	**10946651**	**13407338**

Source: ELSTAT (2024c), Authors' calculations

In 2023, Santorini ranks first in the Cyclades, as it receives 374,950 visitors to museum sites (see Table 5) compared to 78,591 visitors to the archaeological sites and museums of Naxos. Additionally, visitors and revenue at the museums and archaeological sites of Santorini account for 52% and 66% of the corresponding total figures in the Cyclades (see Table 6).

Table 6: Revenues (€) of museums & archaeological sites in Santorini, 2019-2023

	2019	**2020**	**2021**	**2022**	**2023**
MUSEUMS					
Santorini	***246370***	***45110***	***124095***	***294703***	***294929***
New Thira	220820	39915	123957	294231	294231
Old Thira	22798	4678	0	0	0
Collection of Thira's icons and relics	2752	517	138	472	698
Total Cyclades	**391832**	**84700**	**201777**	**421437**	**396380**
Total Country	**23343026**	**4047401**	**10385644**	**23361229**	**35617601**
ARCHAEOLOGICAL SITES					
Santorini	***2963447***	***417624***	***1380363***	***2622138***	***2921445***
Akrotiri of Thira	2811200	354708	1208904	2403282	2730291
Ancient Thira	152247	62916	171459	218856	191154
Cyclades	**4912183**	**656457**	**2311110**	**3994638**	**4450670**
Country	**107595820**	**17128635**	**44349550**	**98173648**	**122235056**

Source: ELSTAT (2024c), Authors' calculation

The strong recovery of inbound tourism, particularly through air and cruise arrivals, underscores Santorini's continued dependence on international markets and reinforces concerns raised in the literature regarding congestion, carrying capacity, and pressure on local infrastructure in island destinations.

4.2. The supply of the tourism product of Santorini

This section presents data on the supply of the tourism product of Santorini, such as the island's hotel potential, which has one of the largest capacities within the Cyclades island complex, as well as data on employment and investment. The analysis emphasizes how supply-side expansion and qualitative upgrading interact with demand growth, raising important questions regarding sustainability and long-term destination management.

4.2.1 Hotel capacity

Santorini in 2023 had 328 hotel units with 8,617 rooms and 17,360 beds (see Table 7), representing 81% of the hotel capacity of the regional unit of Thira (404 hotel units) and 28% of the hotel capacity of the South Aegean Region (1,179 hotel units). In the individual star categories, we observe a high concentration in 4* (30%) and 3* (27%) hotels and a low concentration in 1* (8%). The remaining 5* and 2* categories hold 21% and 13%, respectively. The picture in hotel rooms is more evenly distributed, apart from 1*. Specifically: 5* hotels hold a percentage of 31%, 4* hotels for 30%, 3* hotels for 23%, 2* hotels for 12% and 1* hotels for only 4%. A similar picture in the beds of 5* hotels with 32%, 4* hotels for 30%, 3* hotels for 23%, 2* hotels for 11% and 1* hotels for 4%. In conclusion, we can say that 5* hotels, although representing 21% of the hotel units, nevertheless hold 31% of the rooms and 32% of the beds of Santorini.

The regional unit of Thira in 2023 had 404 hotel units with 10,256 rooms and 20,689 beds, representing 34% of the hotel potential of the South Aegean Region. In the entire South Aegean Region, the 5* hotels of the regional unit of Thira represent 41% of hotel units and hold 37% of both rooms and beds.

Table 7: Hotel Capacity of Santorini & the regional unit of Thira, 2023

	5*	4*	3*	2*	1*	Total
Santorini						
Units	69	99	90	43	27	328
Rooms	2632	2628	2003	999	355	8617
Beds	5473	5235	4067	1856	729	17360
Regional unit of Thira						
Units	72	107	119	73	33	404
Rooms	2738	2848	2690	1536	444	10256
Beds	5691	5681	5477	2924	916	20689
Regional Unit of South Aegean						

Units	174	245	313	329	118	1179
Rooms	7385	7854	8003	6434	1609	31285
Beds	15448	15780	16049	12536	3204	63017

Source: Hellenic Chamber of Hotels (2023), Authors' calculations

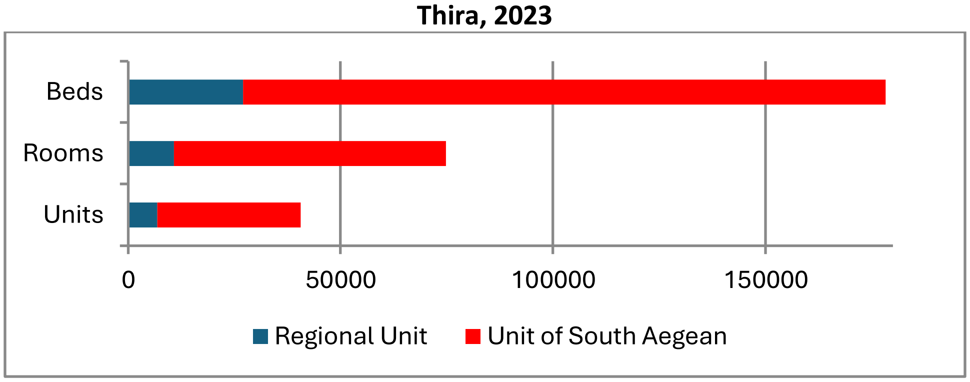
The occupancy rate of hotel accommodations in the Cyclades showed an improvement, from 50.9% in 2021 to 57.5% in 2023. This also affected the occupancy rate in the regional unit of Thira, where it recorded an improvement (from 48.5% in 2021 to 54.9% in 2023), remaining second in the Cyclades in occupancy rate (see Table 8).

Table 8: Hotel occupancy in the regional unit of Thira & in the Cyclades, 2019-2023

	2019	**2020**	**2021**	**2022**	**2023**
Regional Unit					
Mykonos	66.1%	40.8%	55.3%	63.3%	63.4%
Thira	49.8%	29.5%	48.5%	51.2%	54.9%
Paros	39.9%	22.5%	46.2%	48.2%	51.0%
Naxos	38.3%	21.9%	37.8%	41.9%	44.7%
Syros	35.0%	30.2%	44.4%	38.5%	41.5%
Andros	26.0%	19.9%	29.6%	37.9%	37.4%
Kea - Kythnos	22.6%	23.1%	50.5%	35.0%	34.9%
Tinos	24.1%	25.6%	27.5%	30.1%	31.8%
Milos	25.2%	22.8%	31.3%	29.8%	35.8%
Cyclades	**57.7%**	**40.1%**	**50.9%**	**56.2%**	**57.5%**

Source: Hellenic Statistical Authority (2024e), Authors' calculations

Chart 3: Short-term rental accommodation in the Cyclades and the Regional Unit of Thira, 2023



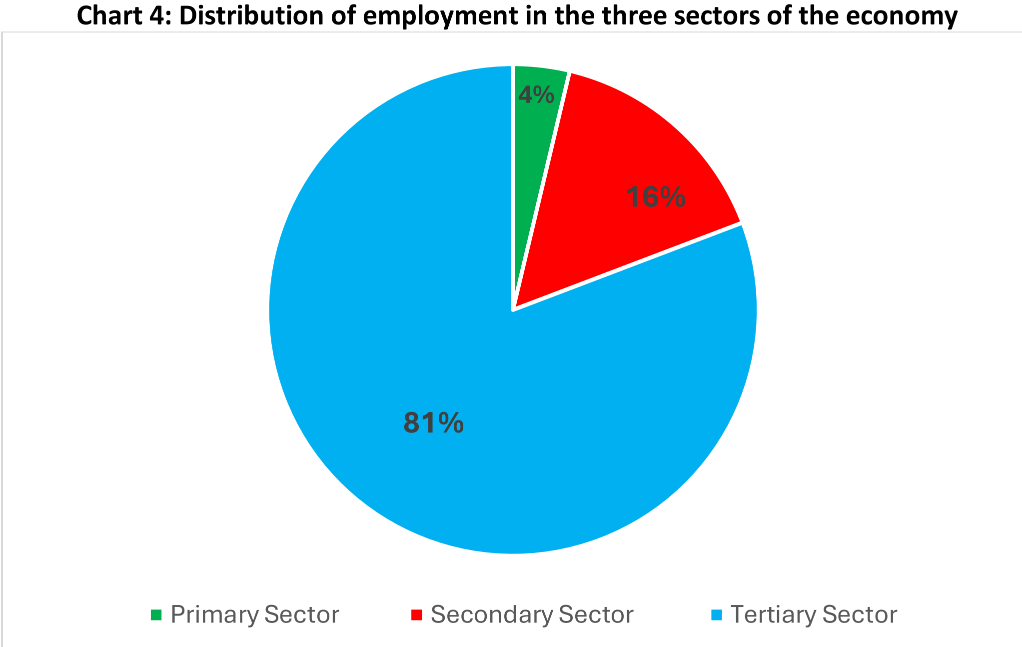
Source: INSETE (2023), Authors' calculations

According to the data shown in Chart 3, in July 2023, the regional unit of Thira had 6,903 short-term rental accommodations[iv] with 10,715 rooms and 27,045 beds. More specifically, it represented 21% of the units in the South Aegean Region, 17% of the rooms and 18% of the beds.

4.2.2 Employment

The tourism sector in the South Aegean Region appears to be steadily increasing in employment compared to other sectors and to contribute to the fight against unemployment, since it has a significant impact on employment (Kasimati, 2022). Based on data from the ERGANI information system (2023), which records all businesses and employees with private law employment relationships[v] 12,294 employees are recorded in 2,658 businesses and branches for the Thira Region (out of 2,350,982 employees and 348,582 businesses in the entire country). Based on the economic characteristics of the 2021 census, which refers to the employment of permanent residents only, it is observed that in the Municipality of Thira there are 15,481 economically active and inactive employees (economically active: 8,174 people, of which 541 are unemployed, economically inactive: 7,309 people). The total number of employees in the three sectors of the economy is 7,631 people, where 284 people are employed in the primary sector (i.e. agriculture, forestry and fishing), 1,184 people are employed in the secondary sector (including construction) and 6,159 people are employed in the tertiary sector (see Chart 4). In the tertiary sector, 38% of employees are employed in hotels-restaurants.

Chart 4: Distribution of employment in the three sectors of the economy



Source: Hellenic Statistical Authority (2024d), Authors' calculations

More specifically, in the tertiary sector there are 2,349 employees in the "Accommodation and food service activities" sectorvi, 1,309 in the "wholesale and retail trade-repair of motor vehicles and motorcycles" sector, 421 employees in the "administrative and support activities" sector, 361 in the "public administration and defense" sector, 289 in the "education" sector, 214 employees in the "human health and social work activities" sector and 1,216 employees in other sectors of the South Aegean Region in 2023.

4.2.3 Investments

Academic literature has shown that the rise of tourism leads to investments in the “accommodation and catering” sector, either by upgrading the existing hotel capacity, or by creating new units and rooms (Kasimati, 2017). This section attempts to estimate the investments made by the hotel sector in Santorini in the years 2022 and 2023 for the creation of new rooms. For this purpose, for new constructions, the following were considered:

- the number of new rooms constructed, according to the Hotel Chamber, and
- the average estimated cost of constructing new rooms per star category based on market data.

From the above, it follows that the total investments by the Santorini hotel sector for the construction of new hotel rooms in the years 2022 and 2023, were estimated at approximately € 64.9 million and € 78.6 million respectively, i.e. an increase of 21% (see Table 9).

Table 9: Number of new hotel rooms in Santorini & construction cost by room category, 2022-2023

New rooms		
Stars*	**2022**	**2023**
1	14	13
2	26	17
3	150	85
4	252	228
5	136	151
Total	**578**	**494**
Contruction cost (in €)		
Stars*	**2022**	**2023**
1	445707	520000
2	1379570	1156000
3	13387500	10200000
4	29988000	36480000

5	19652000	30200000
Total	**64852778**	**78556000**

Source: Hellenic Chamber of Hotels (2024), Authors' calculations

It should be noted that the investment estimates presented are indicative and based on secondary data and average construction costs. As such, they do not capture differences in land values, financing structures, or renovation investments. Nevertheless, they provide a useful approximation of the scale and direction of capital investment in Santorini's hotel sector during the post-pandemic period.

On the supply side, the expansion and upgrading of hotel capacity—particularly in higher star categories—combined with the rapid growth of short-term rental accommodation, suggest an intensification of tourism development. While this enhances competitiveness, it also raises questions regarding sustainability, resource management, and the long-term balance between tourism growth and residents' quality of life.

5. Conclusions - Policy Proposals

The findings of this study reveal that Santorini's tourism recovery is accompanied by structural pressures characteristic of island destinations. The empirical evidence demonstrates that while tourism contributes significantly to economic performance, it also intensifies challenges related to seasonality, infrastructure strain, and environmental sustainability.

On the demand side, domestic tourism records the largest volume of arrivals and overnight stays of domestic tourists in the hotel accommodations of the regional unit of Thira, with a percentage of approximately 22%. The average length of stay of domestic travelers in the regional unit of Thira increased to 2.7 days in 2022 from 2.5 days in 2019 but decreased to 2.6 days in 2023. In 2023, Santorini Airport covered the losses of domestic air arrivals during the period 2020–2022, with the highest share of domestic arrivals in the Cyclades (48%).

Regarding inbound tourism, Santorini dominates foreign arrivals, overnight stays, and international air traffic within the Cyclades, while also functioning as a major cruise destination. This concentration of tourism activity strengthens the island's economic performance but simultaneously exacerbates challenges related to congestion, seasonality, environmental pressure, and quality of life for residents.

On the supply side, the expansion and upgrading of hotel capacity—particularly in higher star categories—combined with rising short-term rental accommodation, indicate a continued orientation toward upscale tourism. While this trend enhances competitiveness, it also calls for careful regulation and coordination to avoid over-expansion and resource depletion.

Despite the phenomena of overtourism which tend to exacerbate the problems of sustainable management of the island (Sarantakou & Terkenli, 2019; Butler, 2018; McKinsey, 2017; Smith, 2017) *, Santorini remains one of the most recognizable Greek destinations and can offer an internationally competitive tourism experience beyond the traditional "Sun-Sea-Sand" model.

Policy proposals should therefore be prioritized along three axes:

(i) strengthening infrastructure and resource management (water, transport, congestion control),

(ii) promoting alternative and off-season tourism forms linked to local production and culture, and

(iii) investing in human capital, governance, and data-driven destination management.

Such an approach would enhance destination resilience, improve residents' quality of life, and ensure the long-term sustainability of Santorini's tourism product.

This study has important implications at multiple levels. From an academic perspective, it contributes to literature by offering an integrated, destination-level analysis of tourism demand and supply in a high-pressure island context. From a practical and policy perspective, the findings support the need for data-driven destination management, targeted infrastructure investment, regulation of accommodation growth, and diversification of tourism activity. At the societal level, addressing tourism pressures is essential for safeguarding residents' quality of life and social cohesion.

Future research could build on this study by incorporating qualitative methods, such as resident and stakeholder surveys, to complement the quantitative findings. Further investigation into environmental impacts, carrying capacity thresholds, and governance mechanisms would also enhance understanding of sustainable tourism development in Santorini and similar island destinations.

*The sustainable management problems of Santorini mainly include the following:

Overtourism: Excessive visitor numbers put pressure on the island's natural and cultural resources, leading to environmental and social problems.

Limited resources: Santorini's insular nature limits the available land and natural resources, making it difficult to serve increasing needs.

Waste management: The increase in visitors leads to greater waste production, while its treatment and recycling are limited.

Infrastructure problems: Existing infrastructure is not always sufficient to support the volume of tourism, with consequences for traffic and service provision.

Environmental degradation: The reckless development of tourism can lead to the degradation of natural landscapes and ecosystems.

Social impacts: Local communities often face challenges such as rising prices and the alteration of their cultural character due to tourist pressure.

The studies highlight the importance of a sustainable approach to tourism management, which takes into account the needs of the local community and the environment.

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Notes:

i. The regional unit of Thira includes the Municipality of Thira, Anafi, Ios, Folegandros, and Sikinos.

ii. Santorini International Airport is located 6 km from the town of Fira in the 'Monolithos' area and has been operating since 1976. Since April 2017, Santorini Airport has been managed by Fraport Greece.

iii. Athinios port is the main port of Santorini, located at the foot of the caldera, 8 km from Fira, the island's capital, and 7 km from Santorini International Airport. Athinios port serves both passenger traffic (to Piraeus and surrounding islands) and freight traffic of the island.

iv. The short-term rental potential data comes from Transparent and concerns the month of July 2023 (peak season). Transparent is a company that monitors and records short-term rental listings on the Airbnb, Vrbo, Booking.com and TripAdvisor platforms.

v. The data is annual and concerns the year 2023 for all businesses in the country that employ employees under a private law employment relationship, as submitted electronically to ERGANI during the period from October 1 to December 15, 2023.

vi. Out of the 437,234 employed in accommodation and food service activities in the country (based on 2021 census data), only 1%, i.e. 2,759, belong to the P.E. of Thira, while the latter represents 34% of the hotel potential of the South Aegean Region in 2023.