Economic Indicators and Cost Analysis in the Hotel Industry of Crete

Efstathios Velissariou and Ioanna Georgedaki

Abstract In a highly competitive tourism environment, effective management, efficient organization, and the ability to calculate operating costs are some basic requirements for the competitiveness and the future viability of hotel businesses. Indicators are a main method of analyzing the operation, the costs, and finally, the economic effectiveness of a business. This paper presents the results of a survey in 160 hotels in the region of Crete in Greece, aiming to investigate the use of indicators as a management tool in hotels and the ability to calculate the cost, but also the break-even point of hotel businesses. Crete is the largest island in Greece, and since the mid-1980s, it has been transformed into a popular tourist destination offering the hotel industry a total of 190 thousand beds. The survey was conducted in the spring of 2021, and the results were disappointing, since only the half of the hotels in Crete use indicators to measure their performance. Also, one in four hotels in Crete and one in three hotels that operate all year round cannot exactly calculate their costs. More specifically, the research showed that about half of the hotels calculate only by estimation (and not exactly) their operating costs, the cost of overnight stays, and the break-even point of the business. Also, according to the results of the survey, for most hotels, the payroll cost and the operating cost per bed is lower than those found in the literature. In particular, payroll costs estimated at 32% of turnover, on the contrary the occupancy rate above which the hotel generates profit is particularly high and ranges at the level of 41–45%. Hotels use economic indicators but not entirely effective as they are mainly used for annual comparisons, while the most popular indicators used are those associated with the daily performance of the business. Finally, through the correlations of the research variables, it is understood that hotels that use indicators can calculate their costs more precisely and can plan the economic operation of the business more efficiently.

E. Velissariou (✉)
University of Thessaly, Larissa, Greece
e-mail: belissar@uth.gr

I. Georgedaki
Hellenic Open University, Patras, Greece
e-mail: std130287@ac.eap.gr

1 Introduction

The basis of a targeted and accurate measurement of performance, costs, and the financial position of a company of any size and industry are the financial statements. The financial statements are based on the accounting figures and provide valuable information about the financial viability of the business as well as its value. Economic indicators are also derived from these situations, which are fractions with numerator and denominator elements from the balance sheet, the budgetary control, or the results of use of the business (Papadeas, 2015).

According to Tourna-Germanou (2015), indicators are also the most basic tool used in the analysis of financial statements. Indicators should be logical, understandable, and able to lead to conclusions that will influence business decisions. Diagnosing the position of the company each time requires the calculation and examination of the appropriate indicators and not the calculation of all possible ones. Basic conditions for a company's financial data to be useful are that they are relevant, reliable, comparable, easy to understand, and have consistency and stability (Tinkelman, 2015).

At the same time, the indicators can be used as a means of quick and effective control within the company, enabling immediate reforms where necessary, while they can also be used to predict the future business course. Therefore, it is a key tool for informing the course and making decisions within each company (Singh & Schmidgall, 2002). It is common for financial indicators to be classified according to the type of business being analyzed, and according to Courtis (1978), they are classified into solvency or risk, efficiency, and management performance ratios. The composition of the indicators also depends on the type of business. For hotel businesses, there are specific operating indicators that measure business operations, performance, costs, and financial figures.

This paper examines the case of the hotel businesses of Crete in Greece. In particular, the research examines whether and to what extent the hotels in Crete make use of financial indicators, to measure operational results, operating costs, and the efficiency of the business in general. It should be noted that the island of Crete is one of the main tourist destinations in Greece and gathers 26% of the 4- and 5-star hotels in Greece.

2 Main Economic Indicators for Hotels

There are many types of indicators in the hotel industry depending on the facilities and services providing by the hotel. On daily basis are mainly analyzed **operational indicators**, such as the rooms occupancy, the average room rate, and the revenue per available room (REVPAR). The sales mix indicator shows the percentage of sales expressed as a percentage of the total made in the hotel for each day, week, month, or year. Finally, the room yield is the share of the actual total room revenue divided by the potential total room revenue.

Cost indicators measure the operating costs of specific departments or factors. Among the most important indicators are average labor cost per hour, labor cost as a percentage of total costs or in relation to revenue, hotel energy costs, and F&B supply costs. Important for the operating efficiency of the hotel are the profit indicators or **Financial performance indicators.** The most used financial performance indicators are earnings before interest, taxes, depreciation, and amortization (EBITDA), earnings before taxes (EBT) but also return on investment, and the gross profit margin (Guilding, 2002). Jagels and Coltman (2004) focus on a different mix of indicators important for hotels, such as liquidity index (working capital) or current ratio (current assets/short-term liabilities), long-term solvency index or coefficient of long-term solvency (total assets/total liabilities). All the above indicators can be characterized as economic business indicators.

Research by Singh and Smidgall (2002) examined the importance among the 36 most frequently used indicators for tourism executives in the USA. According to the results of the research, the ten most essential indicators for the description of hotels as concluded by the above research are the average room rate, the revenue per available room (REVPAR), the paid occupancy percentage, the labor cost, the net profit margin, the rooms department profit, the food department profit, the beverage department profit, the food cost percentage, and the beverage cost percentage.

The research of Pié et al. (2019) used mainly financial indicators to analyze the financial crisis in five-star hotels in Barcelona and Madrid. The indicators used were the total dept, the financial autonomy of the hotel, the coefficient of long-term solvency, the financing of fixed assets coefficient, the liquidity, and the Treasury. Spain is a Mediterranean country with similar tourist characteristics to Greece, but the research by Pié et al. (2019) had a different purpose and was linked to the financial crisis in the period 2008–2011.

In Greece, the Institute of the Association of Hellenic Tourism Enterprises (INSETE) conducts surveys on hotel finances on a regular basis. In the research published in 2020 by Ikkos and Rasouli (2020), the financial data of hotels in Greece are analyzed using indexes based on the financial statements of the companies which was done by region and by class, focusing on the profitability and liabilities of the hotels based on the indicators: Turnover per room, profits before taxes, interest and depreciation to turnover, profits before taxes to turnover, debt per room, debt to turnover, debt to equity, and debt to EBITDA (Ikkos & Rasouli, 2020).

3 Development and Characteristics of the Hotel Industry in Greece

The international mass tourism in Greece started in the mid-1960s, and by the beginning of 2010, the arrivals of international travelers amounted 15 million. After 2012, an explosion is recorded on tourist arrivals, and in just seven years (2013–2019), the arrivals doubled and exceeded 31.4 million (Bank of Greece, 2022a, 2022b). In the following two years (2020 and 2021), tourist traffic decreased significantly, due to the COVID-19 pandemic, but tourism recovered strongly in the year 2022.

The development of mass tourism in Greece also led to the development of the hotel industry. In 1960, the capacity of hotel beds in Greece was only 49.7 thousand beds (Stavrou, 1984), in 1980, the capacity reached 278 thousand beds (NSAG, 1983), in 2000, to 592 thousand beds, and in 2021, the capacity of hotels mounded 879 thousand (Hellenic Chamber of Hotels, 2022).

Basically, most hotels in Greece are small businesses, seasonal operating, and family-run. It is characteristic that the average size of hotels in Greece (in the year 2021) was only 44 rooms or 87 beds. Table 1 shows that the average size of the hotels is related to the hotel class, and 5-star hotels (which is the highest class) have the greatest capacity by 291 beds per hotel.

Tourism in Greece is directly linked to the summer, the sea, the islands, and the beaches, and for this reason, a large part of the hotels operate on seasonal basis. In particular, the tourist season in Greece starts in April, depending on the Catholic Easter and extends until the end of October, in the southernmost regions.

The average employment in hotels in Greece is only 8.1 employees per company and in Crete 10.5, due to the larger size of the hotels. The educational level of hotel employees is also low. Only 13% of those employed in hotels have tourism or hotel education, while in Crete, this percentage is slightly higher at 17% (Ikkos & Rasouli,

Table 1 Number of hotels and capacity by class in Greece (1982 and 2021)

31/12/1982	5- star	4- star	3- star	2- star	1- star	Total
Hotels 1982	44	294	909	1,484	1,354	4,085
Beds 1982	19,333	76,291	84,205	88,277	38,108	306,214
% of total (%)	*6.3*	*24.9*	*27.5*	*28.8*	*12.4*	*100.0*
31/12/2021	**5 stars**	**4 stars**	**3 stars**	**2 stars**	**1 star**	**Total**
Hotels 2021	700	1,767	2,838	3,519	1,274	10,098
Rooms 2021	97,342	124,955	102,357	92,524	24,358	441,536
Beds 2021	203,959	250,566	200,386	175,515	48,829	879,255
Beds of total (%)	*23.2*	*28.5*	*22.8*	*20.0*	*5.6*	*100.0*
Rooms per Hotel 2021	139.1	70.7	36.1	26.3	19.1	43.7
Beds per Hotel 2021	291.4	141.8	70.6	49.9	38.3	87.1

Source NSAG (1983), Hellenic Chamber of Hotels (2022)

2020). The low educational level of employees in Greece is also confirmed by the research of Velissariou (2006).

Also, characteristic of Greek hotels is the family nature of the businesses. Research in hotels in Crete showed that up to seven family members work in the hotel business and an average of 2.32 family members per hotel (Papanikos, 2001).

Among the positives of Greek hotels is the improvement of hotel quality. Between 1982 and 2021, a significant growth in 4- and 5-star hotels was recorded. While in year 1982, hotels of the high-class categories represented only 31.2% of the bed supply; in 2021, this percentage was 51.7%.

The small size of hotels, in relation to the family nature of the businesses, as well the low level of hotel management knowledge, lead most hotels to be highly dependent on the tour operators, which deprives these companies the flexibility and ability to adapt to new business conditions and remain competitive.

At the same time aiming for further development and adaptation to the constantly changing conditions of the market and the great competition, some hotels proceed with centralized development strategies directing their resources to specific market products and technologies. The forms of centralized development that are commonly used in Greece are the *franchising*, the *acquisitions, and mergers* witch can be vertical or horizontal (Walker & Walker, 2014), the *management contracts*, whereby a specialized company undertakes the management of the hotel, the *strategic alliances* or referral associations between one or more companies, often sharing common promotion and quality policies, the *business participations* or *joint ventures*, which is a collaboration between companies of different branches, usually a large construction company with a hotel.

4   Crete as a Tourist Destination

Crete is the largest island in Greece occupying an area of 8336 Km^2 and is divided into four regional units (RU of Chania, RU of Rethymno, RU of Heraklion, and RU of Lassithi). The population on the island amounts to 617,360 according to the 2021 census. Mass tourism in Crete started with a slight delay compared to the rest of Greece in the mid-1970s. In the year 1980, the international tourist arrivals by plane were only 400 thousand. In the year 2011, arrivals were recorded 2.79 million, and in 2019, the arrivals were 4.46 million. The total arrivals in Crete, based on data from the Bank of Greece (2022b), amount to 5.287 million tourists. Most arrivals take place by plane and mainly at the airport of Heraklion (3.3 million arrivals in 2019), and Chania (1.14 million arrivals). Regarding the country of origin of flights to Crete in 2019, passengers from Germany had the highest share with 25%, followed by arrivals from the UK with 11%, France with 11%, the Netherlands with 6%, Italy with 5%, Belgium with 4%, Switzerland with 3%, Russia with 2, and 33% from other countries.

Passenger traffic has also increased in the four major ports of Crete, where a total of 3,137,320 domestic passengers disembarked in 2019. In the same year, Crete was

visited by 397 cruise ships with 607,268 passengers, recording an increase of 84% in the period 2014–2019 when in the same period, the increase in Greece was only 12%.

The average length of stay in Crete is from 8.2 to 8.4 days, when the average in Greece is only 6.3–6.6 depending on the season (Bank of Greece, 2022c).

Table 2 shows that the biggest growth in the figures of tourism in Crete was the number of visitors to museums, showing in 2019 an increase of 184,1% compared to 2014. This fact is not only due to the increase in air arrivals but mainly in the increase of cruise ship passenger arrivals.

The development of the hotel industry in Crete followed a parallel development to the arrivals.

In the year 1980, a total of 29.3 thousand hotel beds were offered in Crete, and in 2021, a capacity of 193.9 thousand beds was recorded (Hellenic Chamber of Hotels, 2022). Most interesting is the fact that 5- and 4-star hotels in Crete represent 61.5% of the total capacity of hotels in Crete and are much higher than the average in Greece, where the corresponding percentage is 51.7%. Also impressive is the fact that 26.3% of the 5- and 4-star hotels in Greece are concentrated in Crete, while in total, it offers 22.1% of the hotel beds in Greece (Tables 3 and 4).

The average occupancy of hotels in Crete in the period 2014–2019 was approximately 63%, much higher than the average in Greece, which at the same period was

Table 2 Main figures of tourism in Crete

	2014	2019	Difference (%)
International arrivals by air	3,533,754	4,455,810	26,1
Arrivals by air (domestic)	707,540	991,611	40,1
Arrivals by ship	2,685,989	3,137,320	16,8
Cruises ships	286	397	38,8
Cruises passengers	329,709	607,268	84,2
Museums visitors	297,569	845,477	184,1
Archeological sites visitors	1,567,924	2,155,260	37,5
Hotel arrivals	3,250,910	5,033,786	54,8
Hotel overnights	20,593,775	27,962,541	35,8

Source INSETE (2020)

Table 3 Hotels establishments and capacity in Crete from 1980 to 2021

	1980	1990	2000	2010	2014	2019	2021
Hotels	342	1,093	1,306	1,549	1,545	1,619	1,644
Rooms	15,676	40,601	61,887	85,407	87,950	96,367	98,547
Beds	29,314	76,095	116,513	161,578	167,308	187,599	193,928

Source NSAG (1983), GNTO (2002), Hellenic Chamber of Hotels (2022), Hellenic Chamber of Hotels (2022)

Table 4 Hotels establishments and capacity in Crete in 2021 per hotel classification

	5-star	4-star	3-star	2-star	1-star	Total
Hotels	149	345	412	565	173	1,644
Rooms	25,130	33,076	17,894	18,315	4,132	98,547
Beds	53,452	65,817	33,890	32,790	7,979	193,928
Share in class (%)	27.6	33.9	17.5	16.9	4.1	100.0
Average revenue per bed	20,656	12,309	11,469	6,351	2,860	13,943 on average
Beds/hotel	359	191	82	58	46	118
Greece beds	203,959	250,566	200,386	175,515	48,829	879,255
% Crete of Greece (%)	26.2	26.3	16.9	18.7	16.3	22.1

Source Hellenic Chamber of Hotels (2022)

at 50% (INSETE, 2020). The sale prices of the rooms depend on the class of the hotel but also on the month of operation. According to the published price, data of 2018 prices range from 44 euros per room in 1-star hotels during the low season to 373 euros in 5-star hotels during the high season and averages 80 euros in the low season and 160 euros during the high season. (Source: Trivago Edited by INSETE, 2020) (Fig. 1).

Due to the high tourist demand, the supply of private accommodation increased at the same time. While in 1977, only 4,000 beds were offered, in 1993, the capacity
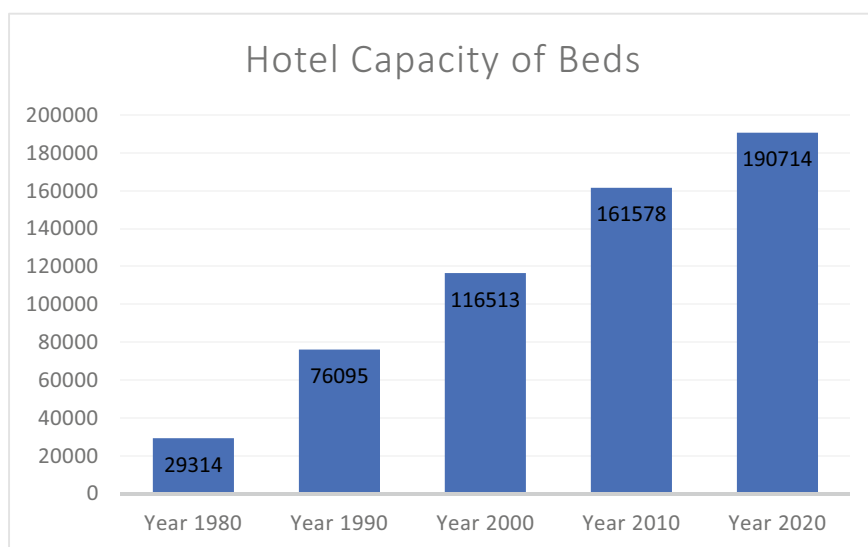
Fig. 1 Growth of the hotel capacity in Crete 1980–2021. *Source* NSAG (1983), GNTO (2002), Hellenic Chamber of Hotels (2022)

Table 5 Main hotel indicators in Crete

Indicators for 2018		Hotel class			
		5-star	4-star	3-star	2-star
Turnover/room	GR	35,501	18,883	9,964	6,886
	Crete	30,424	17,102	10,399	7,198
Net fixed assets/room	GR	22,850	9,066	3,795	1,871
	Crete	24,387	9,896	3,786	2,852
Own funds/room	GR	67,377	30,568	20,544	15,300
	Crete	49,302	26,392	17,467	16,656
Long-term loans/room	GR	55,126	13,014	6,568	2,037
	Crete	54,899	13,979	5,509	2,437
EBITDA	GR	29%	25%	21%	16%
	Crete	31%	21%	20%	22%
EBT	GR	5%	11%	6%	5%
	Crete	10%	11%	7%	6%
Long-term loans/turnover	GR	1.55	0.69	0.66	0.30
	Crete	1.80	0.82	0.53	0.34
Long-term loans/equity	GR	0.8	0.4	0.3	0.1
	Crete	1.1	0.5	0.3	0.1
Long-term loans/EBITDA	GR	5.3	2.8	3.1	1.9
	Crete	5.8	3.1	2.6	1.5

Source Processing Data from INSETE (2019, 2020), Ikkos and Rasouli (2020)

increased to 46 thousand (Velissariou, 1999) and in 2019 to 73,381 (of which 55,758 in Rooms to let and 17,623 in Apartments and Villas).

Then the main indicators are given according to the survey of Ikkos & Rasouli, 2020 for the hotels in Crete and Greece in total (Table 5).

5   Research Objectives and Methodology

The survey was conducted in hotels in Crete in early 2021. The primary scope of the research was to investigate whether hotel units in Crete use, calculate, and analyze hotel indicators and of course to research the ability to calculate the cost and the break-even point of hotel businesses. In this context, the differences in the use of indicators between hotels operating on a seasonal basis and on a continuous basis, and to what extent the size and class of the hotel affects management in terms of the use and analysis of number indicators, were investigated.

The statistical population of the survey was the hotels of the island of Crete, which were 1644, according to the data of the Hotel Chamber. Many hotels at the time of

the survey (spring 2021) were closed, due to their seasonal operation, but also due to covid-19 restrictions, which created uncertainty in the tourism market and may led to many hotels not operating throughout 2021 (Bellos, 2021).

For sending the questionnaires via e-mail to the hotels, information was obtained from the professional registers of the hotelier associations of Crete. A total of 162 questionnaires were collected, i.e., 10% of all hotels in Crete.

6   Survey Results

6.1   Characteristics of the Hotels that Participated in the Survey

The questionnaires were mostly answered by the managers or the owners–entrepreneurs themselves, as well as by the financial departments of the hotels. On average those who completed the questionnaires had 17.6 years of experience in the hotel industry. Regarding the relevance of the studies to the respondents' work, 46.3% answered that it was relevant, while 22.8% answered that it was partially relevant. The above data show that the questionnaires were completed mainly by responsible, qualified, and experienced executives of the hotel sector. Out of the 162 questionnaires that were completed, 76.5% were seasonal and 23.5% were in continuous operation.

In seasonal hotels, the average duration of operation was 6.5 months. The 5- and 4-star hotels operated for 7 months and the 1 and 2 stars only 6 months on average. About 36.7% of the hotels that participated in the survey were classified in the upper categories of 4 and 5 stars, 31.6% of the hotels belonged to the middle class (of 3 stars), and 31.6% in the lower categories of 2 and 1 star, showing a balanced distribution of the sample, but not representative of the distribution of hotels in Crete. For this reason, some results are extrapolated to the real distribution of hotels in Crete (Table 6).

Table 6 Class of hotels participated in the survey

Class	Share in the sample (%)	Continuous operation (%)	Seasonal operation (%)	Hotel allocation Crete (2021) (%)
1-star hotel	10.1	9.8	11.1	4.1
2-star hotel	21.5	24.6	11.1	16.9
3-star hotel	31.6	27.0	47.2	17.5
4-star hotel	24.7	25.4	22.2	33.9
5-star hotel	12.0	13.1	8.3	27.6
Totally	100	100	100	100

Table 7 Capacity of hotels participating in the survey

Hotel capacity	Share (%)	Continuous operation (%)	Seasonal operation (%)
Up to 50 (very small)	44.9	52.8	42.6
51–100 (small)	22.8	22.2	23.0
101–250 (medium)	15.8	19.4	14.8
251–500 (large)	8.9	5.6	9.8
Over 501 (very large)	7.6	0.0	9.8
Totally	100.0	100.0	100.0

In terms of the size of the hotels, it can be observed that the vast majority of 67.7%. in the survey were small and very small hotels (up to 100 beds). The share of the hotels in the middle class (average) hotels (101–250 beds) was 15.8% and, in the class of large and very large hotels, (i.e., more than 250 beds) was only 16.5% of the hotels in the sample. It must be noted that 92.3% of the large and very large hotels were seasonal operating. In general, there has been a reluctance of large and very large hotels to participate in the survey, perhaps for reasons of competition. For this reason, the results are mostly presented below by size or by hotel class (Table 7).

In the question of whether the hotel belongs to a hotel chain, or whether it had a Franchise contract or a management contract, the results did not show anything interesting, since 91.4% of the hotels in the sample had their own management and only 4.9% belonged to some hotel chain, while only 1.2% stated a management contract.

6.2   The Use of Hotel Indicators

The main section of the research concerned the use of indicators. Initially, hotel managements were asked if they set business goals on an annual basis using indicators. The results were expected and showed that the larger the capacity of the hotel, the higher the percentage of those who set annual targets. Especially hotels over 500 beds answered YES at a rate of 91.7% and partially 8.3%, while only 29.6% of small hotels answered with "YES" (Table 8).

To the question of whether hotels use the company's financial indicators to calculate how efficient the individual departments of the hotel are, the positive answers were again in relation to the size, but also to the class of the hotel. In particular, very large hotels, over 500 beds, the usage rate was 75%, having a better performance than 5-star hotels (Table 9).

The most important cost indicators of a hotel are the bed and breakfast (BB) cost, as well the break-even point of occupancy of a hotel. Table 10 shows in detail the results in the question of calculating the BB cost. We observe that 35.8% of hotels have calculated exactly the cost of a BB, while the majority 45.7% have an estimate about the cost. The picture is better in very large hotels (over 500 beds) which have

Table 8 Use of indicators for setting hotel business coals

Business coals (by hotel size)	Yes (%)	No (%)	Partially (%)	No answer (%)	In total (%)
Up to 50 beds (very small)	29.6	31.0	38.0	1.4	100.0
51–100 beds (small)	52.8	25.0	22.2	0.0	100.0
101–250 beds (medium)	72.0	0.0	28.0	0.0	100.0
251–500 beds (large)	85.7	7.1	7.1	0.0	100.0
Over 501 beds (very large)	91.7	0.0	8.3	0.0	100.0
Average	51.3	20.3	27.8	0.6	100.0
Continuous operating hotels	39.5	34.2	26.3	0.0	100.0
Seasonal operating hotels	53.7	17.1	28.5	0.8	100.0

Table 9 Use of financial indicators for the performance of hotel departments

By bed capacity	Yes	No	Partially	In total
Up to 50 (very small) (%)	29.0	29.0	42.0	100.0
51–100 (small) (%)	38.9	33.3	27.8	100.0
101–250 (medium) (%)	52.0	28.0	20.0	100.0
251–500 (large) (%)	64.3	14.3	21.4	100.0
Over 501 (very large) (%)	75.0	16.7	8.3	100.0
On average (%)	*41.7*	*27.6*	*30.8*	*100.0*
By hotel class	**Yes**	**No**	**Partially**	**In total**
1-star hotel (%)	18.8	37.5	43.8	100.0
2-star hotel (%)	33.3	24.2	42.4	100.0
3-star hotel (%)	40.8	24.5	34.7	100.0
4-star hotel (%)	48.7	35.9	15.4	100.0
5-star hotel (%)	63.2	15.8	21.1	100.0
Average of the hotels in the sample (%)	*41.7*	*27.6*	*30.8*	*100.0*
Weighted average of hotels in Crete in total (*) (%)	47.49	26.45	26.08	100.01

(*) The weighted average was calculated based on the actual number of hotels in Crete and their distribution into hotel classes

calculated precisely at 83.3% the BB costs, and this percentage is much higher than in 5-star hotels.

(*) The weighted average was calculated based on the actual number of Hotels in Crete and their distribution into hotel classes. And in the question of calculating the break-even point of hotel occupancy, the results were modest, since only 30.9% of the sample knew exactly the break-even point of the hotel's operation as a percentage

Table 10 Precise calculation of bed and breakfast cost

Hotel types	Exactly (%)	By estimation (%)	Not accurately (%)	In total (%)
Seasonal operating	40.3	44.4	15.3	100.0
Continuous operating	21.1	50.0	28.9	100.0
Up to 50 beds (very small)	25.4	53.5	21.1	100.0
51–100 beds (small)	38.9	41.7	19.4	100.0
101–250 beds (medium)	28.0	52.0	20.0	100.0
251–500 beds (large)	64.3	28.6	7.1	100.0
Over 501 beds (very large)	83.3	16.7	0.0	100.0
1-star hotels	25.0	56.3	18.8	100.0
2-star hotels	29.4	41.2	29.4	100.0
3-star hotels	30.0	50.0	20.0	100.0
4-star hotels	41.0	48.7	10.3	100.0
5-star hotels	68.4	26.3	5.3	100.0
Average of the hotels in the sample	35.8	45.7	18.5	100.0
Weighted average of hotels in Crete in total (*)	44.0	41.8	14.2	100.00

of occupancy. And in this question, the larger hotels were in a much better position than all other hotels (Table 11).

(*) The weighted average was calculated based on the actual number of hotels in Crete and their distribution into hotel classes. A series of indicators were then given to note those indicators which are mainly used by hotels. A total of 700 boxes were checked, and the detailed results are given in the following Table 12.

As expected, the indicator of the occupancy rate and the average room price were the two main monitoring figures. In the 4th place is the indicator profit before taxes to turnover and in the 5th place the revenue per room.

Two indexes with international terminology had been added to the list of indicators, especially the earnings before interest, tax, depreciation, and amortization (**EBITDA**) and EBITDA to sales (ratio), which were marked by only 0.6% of the respondents.

An important factor that affects the efficient operation of a hotel is the labor cost, and for this reason, there are many indicators in relation to the labor cost. In this context, the hotels were asked to declare the payroll costs, as a percentage of the turnover. The answers are then given in terms of the size, but also in terms of the category of hotels, given that high-class hotels offer a variety of facilities and services. However, the results did not show great differences and the average salary cost was

Table 11 Accurate calculation of break-even point of hotel occupancy in Crete

Hotels	Exactly (%)	By estimation (%)	Not accurately (%)	In total (%)
Seasonal operating	32.3	45.2	22.6	100.0
Continuous operating	26.3	39.5	34.2	100.0
Up to 50 (very small)	25.4	42.3	32.4	100.0
51–100 (small)	30.6	44.4	25.0	100.0
101–250 (medium)	36.0	56.0	8.0	100.0
251–500 (large)	28.6	50.0	21.4	100.0
Over 501 (very large)	66.7	25.0	8.3	100.0
1-star hotels	31.3	31.3	37.5	100.0
2-star hotels	14.7	50.0	35.3	100.0
3-star hotels	28.0	44.0	28.0	100.0
4-star hotels	46.2	38.5	15.4	100.0
5-star hotels	42.1	52.6	5.3	100.0
Average in the sample	30.9	43.8	25.3	100.0
Weighted average of hotels in Crete in total (*)	35.9	45.0	19.1	100.04

Table 12 Common indicators used by the Cretan hotels

Hotel indicators	Frequency	Frequency (%)
Occupancy rate	125	79.1
Average room rate	116	73.4
Operating room cost	102	64.6
Profit Bevor taxes/Sales	94	59.5
Revenue per available room	86	54.5
Employee costs	66	41.8
Loans to equity	48	30.4
Real liquidity	44	27.8
Long-term solvency	17	10.8
EBITDA	1	0.6
EBITDA to sales	1	0.6

32.2%, while the smallest category hotels (1 star) declared the lowest percentage of labor costs with 27.1% and small hotels with 50 beds with 29.5% (Table 13).

(*) The weighted average was calculated based on the actual number of hotels in Crete and their distribution into hotel classes. The question was also raised about the estimation of the hotel's bed cost. The lowest cost was in the 1-star hotels with 9.9 euros and reached 32.6 euros per bed in the 5-star hotels (Table 14).

Table 13 Labor costs (LC) as a percentage of turnover in terms of category and size of hotels in Crete

Hotel class	LC to Revenue	Hotel capacity	LC to revenue (%)	LC to revenue (%)
1-star hotel	27.1%	Up to 50 (Very small)	29.5	29.5
2-star hotel	32.3%	51–100 (Small)	33.4	34.8
3-star hotel	32.0	101–250 (Medium)	36.8	
4-star hotel	34.7	251–500 (Large)	35.1	33.4
5-star hotel	32.7	Over 501 (Very large)	31.6	
Sample average	32.2	Sample average	32.2	32.2
Weighted average of hotels in Crete in total (*)	32.96			

Table 14 Bed cost in € by hotel class and size

Hotel class	Average bed cost in €	Hotel capacity	Average bed cost in €
1-star hotel	9.9	Up to 50 (very small)	18.1
2-stars hotel	17.3	51–100 (small)	14.5
3-stars hotel	20.5	101–250 (medium)	20.0
4-stars hotel	23.3	251–500 (large)	28.0
5-stars hotel	32.6	Over 501 (very large)	32.2

Finally, the question regarding the hotel occupancy rate for the break-even point (BEP) showed a relatively high occupancy rate, on 38%. In large and very large hotels, the minimum occupancy rate was even higher at 42.3% (Table 15).

Table 15 Occupancy rate for break-even point by class and size of hotel

Hotel class	% Occupancy	Hotel Capacity	% occupancy	% Occupancy
1-star hotel	31.4	Up to 50 (very small)	37.4	37.4
2-star hotel	37.9	51–100 (small)	36.1	36.8
3-star hotel	36.2	101–250 (medium)	37.7	
4-star hotel	42.2	251–500 (large)	44.1	42.3
5-star hotel	39.5	Over 501 (very large)	40.2	
Sample average	38.0	Sample average	38.0	38.0

7 Conclusions

The hotel industry in Greece is characterized by its gradual growth after the 70s, the small size of the hotels, the seasonal operation during the summer, and the family business nature of many hotels. The hotel industry in Crete has similar characteristics and has been developed after the 1980s, as a result of growing tourism demand, which increased after the beginning of the 2010s. In 2019, it is estimated that 5.3 million tourists visited the island of Crete. Special characteristics of the hotel sector in Crete are that the hotels are comparatively bigger than the average size of Greece, that 61.5% of hotel beds are classified to the 2 upper categories of 5 and 4 stars. The tourist season in Crete lasts 6.2–6.94 months (in the higher categories of hotels), a fact that is also confirmed in an earlier study, which measured the duration of the tourist season at 6.95 months (Papanikos, 2001).

About 10% of the hotel in Crete participated in this research and consequently some generalized conclusions can be drawn, not only for the hotel sector of Crete, but also of Greece in general, since 26% of 4- and 5-star hotels are concentrated in Crete. It should be noted that 76.5% of the hotels that participated in the survey were seasonal.

The research clearly showed that large capacity hotels make systematic use of indicators as a management tool, set business goals, and methodically evaluate the performance of individual hotel departments. In fact, in many cases, the results were better in the large hotels, compared to the 5-star hotels. Also, the seasonally operating hotels make better use of the indicators compared to year-round hotels.

Based on the survey results, it is estimated that only 44% of hotels in Crete have accurately calculated the cost of a BB room, while 41.8% make estimations about the cost. The results are clearly better in the very large hotels (over 500 beds) which have accurately calculated the cost at a percentage of 83.3%, and the percentage is much higher than in the 5-star hotels. In the question of calculating the hotels' break-even point of occupancy, the results were moderate, since only 30.9% of the sample knew exactly the hotel's break-even point as an occupancy rate, which corresponds to 35.9% of the hotels in Crete.

The main indicators studied by the surveyed hotels were occupancy rate, average room rate, room operating cost, earnings before taxes/turnover, revenue per available room, and payroll cost. In terms of the percentage of labor costs to turnover, the survey did not show great differences, and payroll costs averaged 32.2%, while the lowest category hotels (1 star) reported the lowest percentage of labor costs by 27, 1% and small hotels up to 50 beds by 29.5%.

The operating cost of a bed is directly related to the category and size of the hotel and ranges from approximately 10 euros per bed in 1-star hotels and reaches approximately 33 euros in 5-star hotels. Break-even occupancy rate is at 38% on average, with the lowest percentage being reported by 1-star hotels, while higher class hotels and larger hotels require higher occupancy rates.

The use and application of the indicators are directly related to the size of the hotel, and the very large hotel in Crete make much better use. Statistical correlations

showed that hotels that can measure operating costs can calculate the cost of overnight stays and can also calculate the break-even point of the hotel. In addition, hotels that use hotel indicators can calculate exactly or by estimation their operating costs. On the other side, those hotels that do not use financial indicators tend not to be able to calculate their costs.

Concluding, those hotels that use financial indicators tend to have a more complete picture of the financial situation of the business and the various types of costs. This could also be an argument for the greater use of indicators by hotels. In particular, by using the indicators more systematically, hotels will be able to control their costs more effectively, which will lead to an increase in their profitability and viability.

References

Bellos, H. (2021, April 4). Tourism: In three waves, hotels will be opened. *Kathimerini.* Retrieved June 18, 2022, from https://www.kathimerini.gr/economy/561323983/toyrismos-se-tria-kym ata-tha-ginei-to-anoigma-xenodocheion/

Bank of Greece. (2022a). *Number of inbound travelers in Greece by Country of Origin.* Retrieved June 1, 2022a, from https://www.bankofgreece.gr/en/statistics/external-sector/balance-of-pay ments/travel-services

Bank of Greece. (2022b). Visits by region for main countries of origin Retrieved June 1, 2022b, from https://www.bankofgreece.gr/en/statistics/external-sector/balance-of-payments/travel-services

Bank of Greece. (2022c). Average_length_of_stay_regional. Retrieved June 1, 2022b, from https://www.bankofgreece.gr/en/statistics/external-sector/balance-of-payments/travel-services

Courtis, J. K. (1978). Modelling a financial ratios categoric framework. *Journal of Business Finance & Accounting, 5*(4), 371–386. https://doi.org/10.1111/j.1468-5957.1978.tb01059.x

GNTO. (2002). *Development of tourism traffic 2002.* Greek national Tourism Organization. Department of Studies and Investments, Athens.

Guilding, C. (2002). *Financial management for hospitality decision makers.* Butterworth-Heinemann.

Hellenic Chamber of Hotels. (2022). *Greece Hotel capacity 2021.* Retrieved June 18, 2022, from https://www.grhotels.gr/category/epicheirimatiki-enimerosi/statistika/dynamikotites/

Ikkos, A., & Rasouli, G. (2020). *Analysis of financial data of hotels in Greece—By destination and by Star Category, 2016 and 2017.* Retrieved June 1, 2022, from https://insete.gr/wp-content/upl oads/2020/04/Hotel-Study-2016-2017-.pdf

INSETE. (2019). Institute of the association of Greek tourism enterprises. *Region of Crete Annual report on competitiveness and structural adjustment for the year 2018.* Retrieved June 1, 2022, from https://insete.gr/wp-content/uploads/2020/04/Περιφέρεια-Κρήτης.pdf

INSETE. (2020). Institute of the association of Greek tourism enterprises. *Region of Crete Annual report on competitiveness and structural adjustment for the year 2019.* Retrieved June 1, 2022, from https://insete.gr/wp-content/uploads/2020/05/21-01_Crete-1.pdf

Hellenic Chamber of Hotels. (2020). *Greece Hotel Capacity 2019—By Region—Prefecture—Island.* Retrieved June 18, 2021, from https://www.grhotels.gr/wp-content/uploads/2020b/02/2019-Campings_regions.pdf

Jagels, M. G., & Coltman, M. M. (2004). *Hospitality management accounting.* Wiley.

NSAG. (1983). *Tourism Statistic Year 1981.* National Statistical Agency of Greece.

Papadeas, P. (2015). *Administrative accounting.* Hellenic Academic Libraries Association. Retrieved June 1, 2021, from https://repository.kallipos.gr/pdfviewer/web/viewer.html?file=/bitstream/11419/2449/1/00_master_document.pdf

Papanikos, G. (2001). *Regional analysis of the Greek hotels.* Research Institute for Tourism.

Pié, L., Bonillo, I., Barcelo, J., & Fabregat-Aibar, L. (2019). Analysis of some economic-financial ratios to analyze the financial crisis in five-star hotels in Barcelona and Madrid. *Intangible Capital, 15*(2), 99–113. https://doi.org/10.3926/ic.1361

Singh, A. J., & Schmidgall, R. S. (2002). Analysis of financial ratios commonly used by US lodging financial executives. *Journal of Retail & Leisure Property, 2*(3), 201–213. https://doi.org/10.1057/palgrave.rlp.5090210

Stavrou, S. (1984). *The tourism growth in Greece in the period 1964–1982.* Greek national Tourism Organization). Department of Research and Studies.

Tinkelman, D. P. (2015). *Introductory accounting.* Routledge. https://doi.org/10.4324/9781315665801

Tourna-Germanou, E. (2015). Analysis of financial statements—Decision making. In E. Tourna-Germanou (Ed.), *Financial accounting* (pp. 290–312). Hellenic Academic Libraries Association. Retrieved June 1, 2021, from https://repository.kallipos.gr/handle/11419/959

Velissariou, E. (1999). Tourismus and Wirtschaft-Bilanz der ökonomischen Entwicklung. In S. Lennartz (Ed.), *Tourismus auf Kreta. Bensberger Protokolle, 93.*

Velissariou, E. (2006). Criteria of quality in hotel accommodations. Measurements in the Greek Hospitality. In *24th EuroCHRIE Conference "In search for excellence for tomorrow's Tourism, Travel and Hospitality".*

Walker, J. R., & Walker, J. T. (2014). Introduction to hospitality management. Pearson Education Limited. Retrieved June 1, 2021, from https://www.pearson.com/us/higher-education/program/Walker-Introduction-to-Hospitality-Management-Plus-My-Lab-Hospitality-with-Pearson-e-Text-Access-Card-Package-5th-Edition/PGM334782.html