

Article

The Three Dimensions of Small Accommodation Businesses and Their Efficiency

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Abstract: Measuring efficiency and determining factors that may influence it are very important steps to improve the businesses' competitive position, growth, and sustainability. This paper aims to investigate the efficiency of small accommodation businesses located in Greek non-coastal areas and to determine a set of factors that may affect it, from the perspective of the three dimensions of family businesses (family, business, ownership). The method adopted, in order for the research objective aim to be fulfilled, is the two-stage Data Envelopment Analysis model. In the first stage, the efficiency was estimated from a sample of 150 businesses. In the second stage, the influence of various factors on the examined efficiency was investigated by implementing a Bootstrap Truncated regression. The results showed that the majority of the examined businesses presented a low level of efficiency. Regarding the determination of the factors, it occurred that the manager's age, ownership form, and business type influenced the relative efficiency level in contrast to the factors of the business's age, the manager's sex and education level, the state of succession, as well as the manager's agricultural employment. By fulfilling the aim of this study, a significant contribution to the relative literature and especially to the hospitality field is offered.

Keywords: three-dimensional model; family; hospitality; efficiency; factors; DEA; Truncated; non-coastal; Greece; Central Macedonia



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1. Introduction

The hospitality industry is a sector that provides relative services [1], which in many cases are offered to the customer individually, but also in combination [2]. These services refer to the accommodation, food, drink, and tourism services, where their offer aims to satisfy customer needs [1] and, therefore, to obtain profit [3] and sustainability. The economic units—according to various literature findings—that are active in the hospitality sector and, specifically, in that of accommodation, refer to small, medium, and large family—or not—businesses such as standard hotels [4–8], motels [5,9,10], guesthouses [4,11–13], agritourism businesses [2,14–16], and short-term rental houses and apartments [17–20]. In the present paper's concept, guesthouses, agritourism, and short-term rental firms are considered small accommodation businesses. Hospitality businesses, in addition to their economic activity, are an equally active area of scientific literature as they play a prominent role in knowledge dissemination and in providing assistance to professionals that have the desire to solve a variety of operational and managerial problems [21]. Efficiency, in particular, is of great research interest as it is widely recognized in the field of hospitality for providing new data related to the efficiency level and its influential factors [2,3,16,20,22–32].

The related literature, despite the above-mentioned facts, lacks references related to the investigation of the efficiency level in small accommodation businesses and, in particular, from the three dimensions' perspective, even if their theoretical approach (family,

business, ownership) is examined widely [33–35]. Regarding this specific issue, the need to create knowledge on how family ownership may affect the survival and sustainability of accommodation businesses in agricultural areas has been occasionally pointed out [36]. However, a related study [36] focused only on the human capital.

The above-mentioned elements, essentially, comprise a literature gap that led the authors to investigate the efficiency of small accommodation businesses by taking into account the three dimensions of a family business type (family, business, ownership) as the input variables. A set of variables, in parallel, which is linked to the three dimensions of business—such as the manager’s age, sex, and education level, the existence of agricultural activity, the business’s age, the business type, the state of succession, and the ownership form—was examined in order for the influence on the resulting efficiency level to be estimated. Through the objective purpose’s formulation, this paper attempts to answer the following research questions:

1. What is the efficiency level of small accommodation businesses considering the three dimensions of the family business as DEA model variables?
2. Is the resulting efficiency influenced by factors that are related to the manager, business, and ownership form?

The three-dimensional model’s theoretical presentation was deemed necessary in order for the above-mentioned research questions to be answered. This theoretical presentation will also help the readers understand why the three dimensions of family business are worth studying empirically. The corresponding factors’ presentation—which may affect the resulting efficiency level—was equally carried out [14,29,37–42]. Family businesses dominate the sector of hospitality [5,8,43] and present specific features that differentiate them due to their triple dimensionality (family, business, ownership) [33–35]. According to [33] and [34], the family axis represents the family business’s development by encouraging children to enter the business and be leaders; the business axis concerns the business’s development from its beginning to its mature phase; the ownership axis refers to the evolution of the family business from the phase of a controlling owner to the next phase of joint owners (siblings, cousins, etc.).

According to [44], a family business is taken into account as a business venture that belongs to a human, a couple, or a family. Therefore, it could be said that studying this specific definition [44], the coexistence of two specific features such as family and business is established. This statement leads to the conclusion that, in a family business, ownership and management relationships are involved, something that influences the strategic and organizational business procedure [43]. In the Greek literature context, it is supported that a family business is a living system of three subsystems (family, business, ownership), the interaction of which leads to the business’s success and sustainability ([45], p. 103).

The success or failure of family businesses is measured through financial or non-financial results that describe their corresponding dimensions [46]. Financial results refer to the business’s development and profitability, while the non-financial ones correspond to the efficiency of the process, the employees’ and family’s well-being, the business’s and family’s reputation and prestige, the family’s happiness, the corporate social responsibility, and the community integration [46]. On the contrary, the authors in [44] believe that a successful family business is linked to subjective, as well as objective criteria, and this success can be measured according to the owners’ needs and purposes as the increase in profitability and the achievement of sustainability. In the same context, it is believed that business failure cannot necessarily be understood as a low average of profits or sales.

Most of the small family businesses that are activated in the sector of hospitality and mainly in agritourism could not operate without the contribution of family members [47]. Family values include the employees’ and customers’ legitimacy, life quality improvement, ownership maintenance, property management, work security, and the family name’s (reputation) maintenance. Correspondingly, family dynamics are related to high-quality work, the family members’ relationships of sympathy, and the responsiveness to change taking into account the growth constraints and the long-term payoff prospects [44,45,48].

In conclusion, it could be said that considering the three dimensions of the family business, efficiency is linked to the values, dynamics, and family members' response to changes and business operations.

Through the context of the operating literature, it is supported that owners' and firms' characteristics constitute critical factors for the size, performance, and efficiency of small businesses [14,37]. This is a reason that led the authors to additionally study a set of various factors' influence on the possible efficiency level.

Age, sex, and education in combination with management, accounting, and marketing skills determine managerial behavior and leadership style, which in turn affect business performance [29,38,41]. The managers' age is related to experience, which in turn offers more knowledge, which increases the possibilities of business sustainability. However, the efficient use of technology is less possible since older entrepreneurs are less familiar with it [49]. The existence of agricultural activity may also be worth considering as it is argued that the combination of agricultural and tourism activities boosts household income [14,29]. Regarding this issue, it is argued that there are many cases in which farmers, owners of agricultural holdings, decide to create agritourism units in order to differentiate and increase family income. This decision stems from the leaders' availability of family labor, assets, the related subsidies, and the touristic nature of the area [50]. If a manager is equally active in the sector of agriculture, this is indicated by his/her inclusion in the Greek Register of Farmers and Agricultural Holdings [51], whose purpose is to record all the necessary alphanumeric and cartographic data in order for the agricultural policy to be exercised.

A business's age is linked to the reputation and the presence of satisfied and, as a consequence, loyal and stable clients. A long-standing business indicates that it has been able to identify and satisfy the needs of its customers by retaining them in its customer base [2,14,39,41]. The preparation, as well as the existence of a succession plan helps the business performance and impacts the final result [42]. Managers who are willing to transfer the management and the property to their successors need a sustainable plan that reduces management risk and improves efficiency [52]. The business type in terms of services offered (simple/complex) is a characteristic of businesses that affects their performance [37,40]. The ownership form in terms of business assets (rented/owned) has not been studied widely. However, through the related literature aspects, it appears that there is a greater emotional connection to the business assets in the case that they are owned by the family [14], while in the case of rental facilities and equipment, the mood for business utilization and exploitation is dominant.

In light of the above, it could be understood that there is a broad theoretical background that is worth investigating empirically through the completion of this study. With a desire that there will be further research development in the sector of hospitality, the present study's authors carried out a survey on small accommodation businesses located in non-coastal areas of Central Macedonia. Technical and economic data were used in order for the efficiency level to be estimated. Data related to the factors that may influence the resulting efficiency level were also used. The methods that were implemented in order for useful results to be extracted were those of Data Envelopment Analysis (DEA) and Truncated regression. By fulfilling the objective aim of this study, a significant contribution to the literature and especially to the field of hospitality is offered. Additionally, various management and operational directions regarding the factors that influence the efficiency of businesses are also given. The remainder of this paper is structured as follows: (1) A literature review is given (Section 2), where previous empirical analyses and their findings are presented. (2) The Materials and Methods Section (Section 3) presents the study area, data type, and methodologies used. (3) The results are then presented (Section 4) and discussed (Section 5). Finally, the present study's conclusions, limitations, and proposals for further research approaches are given in detail (Section 6).

2. Literature Review

Through the description of related empirical studies, the authors aimed to clarify the concerns that were created and led to the formulation of the research purpose, as presented in the Introduction Section. The hotel industry, and in general the hospitality sector, need precise technics that may evaluate the efficiency and compare the operational capabilities [53]. In this case, the non-parametric method of Data Envelopment Analysis (DEA) is appropriate as many studies implement it in order for the hospitality businesses' efficiency level to be estimated [22,39,53–57]. In this section, consequently, it was chosen to present studies in which the non-parametric DEA method is implemented in order for the various hospitality businesses' efficiency to be estimated [2,16,24,25,58]. DEA implementation is presented individually, but also in combination with other methods (Tobit Regression Analysis, Bootstrapping Technique) to clarify the reasons for which these methods were chosen to be used in the context of this analysis.

Poldrugovac [25] studied the efficiency of Croatian hotels adopting an output-oriented Constant Returns to Scale (CRS) DEA model. Furthermore, the relationship between efficiency and size (number of rooms) using the ANOVA technique was also examined. Finally, they extracted a statistically significant relationship between the examined variables, concluding that small firms appeared more efficient than larger ones. Oukil [24] implemented a two-stage DEA model in order to estimate the efficiency of 58 hotels that are located in Oman. During the first stage, Reference [24] used the DEA Bootstrap for the efficiency estimation, while in the second one, the Simar and Wilson model (double-Bootstrapping Truncated regression) was adopted to determine the factors that affect the inefficiency level. As an input variable, among others, the number of rooms was used, while as the output variables, the annual revenue and the number of overnight stays were taken into account. They concluded that the offer of entertainment activities is not a factor that affects the hotels' efficiency.

Correspondingly, Reference [20] identified the efficiency of short-term vacation firms implementing the two-stage DEA method. Firstly, they identified the units' efficiency level using the DEA Bootstrap, and secondly, they examined the effect of a factors' combination on the resulting efficiency using multivariate regression models (Tobit and Bootstrap Regression). Capital, labor, and operational cost were chosen as the inputs, while total revenue and sales were the model's outputs. This study showed that the legal form, total revenues, tourist arrivals, overnight stays, and the average length of stay of visitors contribute to the efficiency of short-term vacation firms. The same does not exist in the case of business size and economic crisis. Arru [16] estimated the efficiency of 37 agritourism businesses located in Sardinia using an output-oriented Variable Returns to Scale (VRS) model. Based on the dual-nature of the agritourism practice (symbiotic relationship of agriculture and tourism), they estimated the efficiency from the perspective of the dual-behavior processes. Their findings showed that the efficiency of agritourism firms is low and could be improved if the technical inputs are properly utilized. Parte and Alberca [58], identified the efficiency of small accommodation firms and, in parallel, analyzed the business performance through the efficiency level in two sustainable models (cultural and rural tourism). Lastly, the authors proved that the rural tourism businesses' efficiency is higher than that of cultural tourism.

Lastly, Reference [2], using the two-stage DEA method, estimated the efficiency of 151 small accommodation firms in Greek non-coastal areas. As the outputs were chosen the total number of nights spent and the businesses' total revenues. The inputs that were taken into account in the analysis were those of the building facilities' surface, the operational expenses, the total capital investment, the total labor hours, and lastly, the family labor hours. Then, the authors used the double-Bootstrapping Truncated procedure [59] in order to investigate the role of five business factors in the efficiency level. Their analysis showed that the level of efficiency was low and that the factors of firm size, days of operation, and variety of activities (simple or complex) affected the inefficiency levels.

The extended review of the above-mentioned empirical studies led to the conclusion that efficiency in the sector of hospitality and tourism has been widely studied. In this way, the literature gap regarding the three dimensions of family businesses is once again noticeable. Aiming at the fulfillment of this literature gap, the present study's authors chose to approach in a different way the estimation of accommodation businesses' efficiency by including the three dimensions of family businesses (family, business, ownership) as variables and, more specifically, as the model's inputs.

This investigation was chosen to take place in a set of small accommodation family businesses because, as has been already mentioned previously, the small and medium family type of business dominate the sector of hospitality [5,8,43], which affect various economic indicators such as economic growth [58], employment [5], or the current account balance. This type of business also presents specific characteristics that differentiate it due to its triple dimensionality [33–35]. Additionally, the current investigation refers to non-coastal areas because the efficiency estimation of small businesses that are active in agricultural areas—including those in non-coastal ones—is limited [2,16,60,61]. Lastly, the choice to further study the influence of various factors [14,29,37–42] on the efficiency will lead to quoting managers' operational and managerial proposals and to reinforcing the relative literature.

3. Materials and Methods

3.1. Study Area

This survey was oriented toward small accommodation businesses located in non-coastal areas of the region of Central Macedonia and lasted for 6 months (November 2018–May 2019). In the context of this survey, 150 accommodation businesses (from the 342 that were identified through the Ministry of Tourism) participated with data that concern technical and economic elements for the economic year of 2018. This data type was used to identify the efficiency level. Furthermore, data that were related to the factors that may affect the efficiency level were also collected. The accommodation businesses that participated in the survey were considered too small (≤ 40 beds, < 10 employees) [62].

The Region of Central Macedonia (Figure 1) is the largest (18,811 km²) Greek region (14.51% of the country's total area) [2] and presents a large variety of resources for the development of alternative forms of tourism (lakes, rivers, mountains, hot springs, archaeological sites, traditional settlements, cultural heritage, local traditional products) [63]. Specifically, the coastal areas of Greece and the Region of Central Macedonia seem to predominate in terms of the overnight stay number (Figure 2).



Figure 1. Region of Central Macedonia.

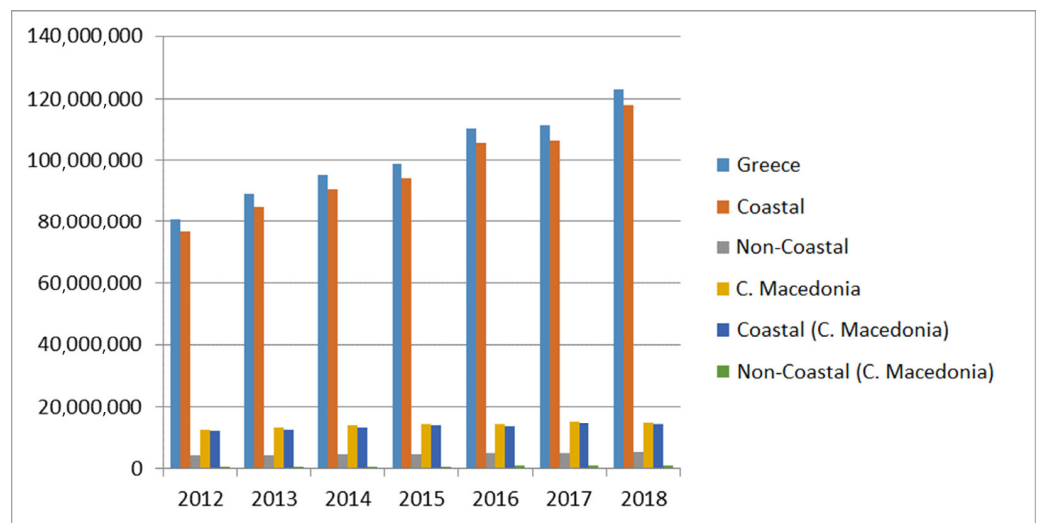


Figure 2. Overnight stays in coastal and non-coastal areas in Greece and Central Macedonia Region (years 2012–2018). Source: data processing of [64].

The study area was selected because of the easy access to the data [65], while the selection of non-coastal areas was made due to the empirical need to (a) maintain the population (Figure 3) and (b) develop tourism models—except for the diptych of “sun-sea”—adapted to the new conditions, as they were formed after the economic crisis in Greece [2,66].

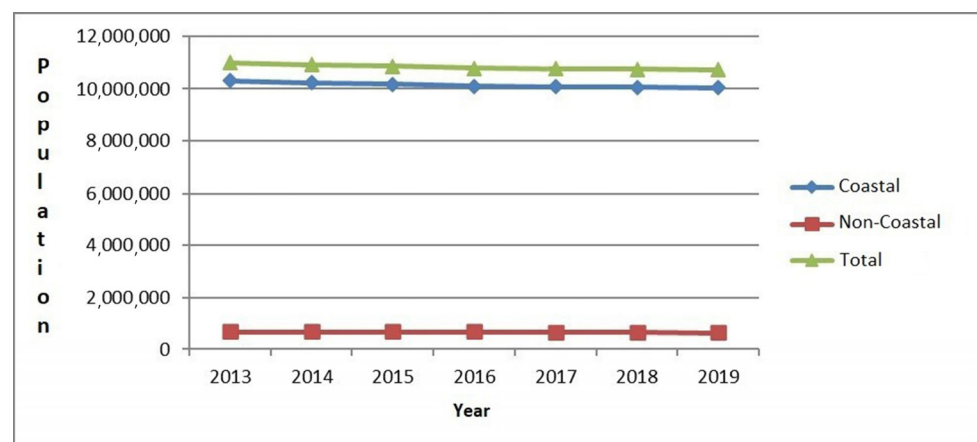


Figure 3. Population in coastal and non-coastal areas in Greece (years 2013–2019). Source: data processing of [64].

3.2. Data Envelopment Analysis

The two-stage non-parametric DEA method was implemented in order for the first question to be answered. This method was selected because it is considered a reliable methodology that leads to reliable results, something that is proven by its implementation in various sectors, such as the banking industry [67], insurance [68], agriculture [69,70], and of course, hospitality [3,20,23,24]. In the first stage, the small accommodation businesses’ efficiency estimation was made through an output-oriented model approach. It is well known that there are two kinds of returns-to-scale-based models, known as Constant Returns to Scale (CRS) and Variable Returns to Scale (VRS) models [16,25,58,71,72]. In this paper, the VRS model was used, following the related literature [58]. The VRS model makes

possible an efficiency estimation without considering the effect of scale. The steps followed for an output-oriented VRS model were as follows [24,73]:

$$\text{Max}_{\theta_i} \lambda_i \theta_i \quad (1)$$

subject to:

$$\sum_{j=1}^n \lambda_j y_j - \theta_i y_i \geq 0 \quad (2)$$

$$\sum_{j=1}^n \lambda_j x_{kj} \leq x_{ki} \quad (3)$$

$$\lambda_i \geq 0 \quad (4)$$

$$\sum_{j=1}^n \lambda_j = 1 \quad (5)$$

where: $k = 1, \dots, m$: inputs and $j = 1, \dots, n$: small accommodation businesses.

The resulting efficiency represents the output's maximum increase, which is needed in order to reach the efficiency frontier through a given level of input. The results should range from 0 to 1. When the value is equal to 1, the firm is considered fully efficient, meaning that it has reached its maximum potential. In any other case, the firm is not considered fully efficient [16,52,69].

In order for the statistical limitations of DEA to be addressed, the generalized Bootstrap DEA method was used. The second one is currently the most-attractive alternative as it analyzes the sensitivity of efficiency values to various changes in the sampling distribution. The Bootstrap is based on the idea of approximating the sampling distribution by simulating the generation of data using, for example, the Monte Carlo process. Simar was the first researcher that implemented this method in frontier models. A detailed presentation of the algorithm for the non-parametric estimator is given in Simar and Wilson's project [73]. The selection of DEA inputs and outputs is based on the related literature. Three variables were used as the inputs and one as the output. The only variable that appears as the output is the total revenue (EUR) [3,20,24,37,53,74,75] and includes the accommodation businesses' revenue from overnight stays and other activities such as catering. The current model's inputs refer to the family members working in the business (number of people) [20,58], the total operating costs (EUR) of the business [53,76], and the businesses' value of assets (EUR) [58]. The variables' basic descriptive statistics are presented in Table 1. Family members who work in the family business express the family dimension. This variable ranges from 1 to 8 working members. To be more precise, there are 2 family working members on average for the total of the accommodation businesses. The total operating costs express the dimension of the business and present an average of EUR 29,638.31, where the value of EUR 173,207 is the maximum one. Lastly, each of the businesses' value of assets refers to the third dimension (property) and presents an average of EUR 383,882. The total businesses' total revenue—used as the variable of output—presents an average of EUR 63,347.8 (Table 1).

3.3. Truncated Regression Model

In the second stage, the factors affecting the efficiency of small accommodation businesses were identified [14,29,37–42]. To be more precise, to determine the factors and evaluate the consistency of the efficiency scores, a Truncated regression model with a double-Bootstrapping procedure was adopted according to the algorithm of [59]. This method was chosen to be used as it appears to be used in the latest literature [2,24] against Tobit for two reasons [59]. The first one concerns the possibility that the efficiency scores are corrected to each other, while the second one focuses on the variables that might appear

in the regression and the calculation of efficiency [24]. The regression model on which the entire algorithm is based is [59]:

$$\hat{\phi}_i = \beta Z_i + \varepsilon_i, i = 1, 2, \dots, n \tag{6}$$

where:

- $\hat{\phi}_i$: the dependent variable, corrected efficiency;
- Z_i : the environmental factors affecting efficiencies;
- β : the coefficient linking the independent and dependent variable;
- ε_i : independent term indicating potential error.

In order to determine the efficiency factors, the following algorithm was used [24,59]:

Step 1: Calculate the efficiency $\hat{\theta}_i$ for each small accommodation business through DEA;

Step 2: Use the maximum likelihood (ML) to find the parameters $\hat{\beta}, \hat{\sigma}$ from the Truncated regression;

Step 3: Repeat the next 4 steps B times to generate a set of Bootstrap estimates:

1. For $i = 1, 2, \dots, M$, randomly select ε_i^* from the normal distribution $N(0, \hat{\sigma}_\varepsilon)$ with left Truncation $\{1 - \hat{\beta}'z_i\}$;
2. Execution of the equation: $\theta_i^* = \hat{\beta}'Z_i + \varepsilon_i^*, i = 1, 2, \dots, M$;
3. Set $x_i, y_i^* = \frac{y_i \hat{\theta}_i}{\theta_i^*}$ for each $i = 1, 2, \dots, M$;
4. Run $\theta^* = \theta(x_i, y_i)$ for each $i = 1, 2, \dots, M$ with substitution $(x_i, y_i) = (x_i^*, y_i^*)$.

Step 4: Calculate the bias-corrected estimator using Bootstrap estimators and the original estimator;

Step 5: Estimate the Truncated regression of θ_i^* of z_i using ML;

Step 6: Repeat the next 3 steps B times to obtain the estimators:

1. For $i = 1, 2, \dots, M$, select ε_i from $N(0, \hat{\sigma}_\varepsilon)$ with left Truncation $(1 - \hat{\beta}'z_i)$;
2. For $i = 1, 2, \dots, M$, execute the equation $\theta_i^{**} = \hat{\beta}'Z_i + \varepsilon_i^{**}$;
3. To find $\hat{\beta}, \hat{\sigma}_\varepsilon$, the ML method is used.

Step 7: Construct confidence intervals for the efficiency scores.

Table 1. Descriptive statistics of the variables used in DEA and Truncated regression.

Variables Table	Mean	SD	Min	Max
Outputs and Inputs/DEA Variables				
Total revenue (EUR)	63,348	66,258	900	360,000
Family members (number)	2	1.3	1	8
Total expenses (EUR)	29,368	27,321	640	173,207
Value of assets (EUR)	383,882	29,397	0	1,480,000
Business-Specific Variables/Truncated Regression Model Variables				
Business's age (year)	13	7	1	51
Manager's age (year)	49	11	23	83

An extensive presentation of this algorithm is presented in the projects [24] and [73]. Through the context of this study, the specific algorithm was implemented in the programming environment of R and executed 2000 times. This choice was made as R was applied for the same purpose in other related research approaches [24]. The selection of the variables that express the factors affecting the efficiency level was based on the literature, and a correlation analysis was performed. The factors defined for this purpose are the age of the business (in years), the business type—provided services—(simple/complex), which is a dichotomous variable (1: businesses that only provide accommodation/2: businesses that also provide other services), the symbiotic relationship with agriculture (1: manager included in the Farmers Register/2: non-inclusion), the manager's sex (1: male/2: female),

the case of succession (1: businesses that have a successor/2: those that do not/0: I do not know—I will not answer), the manager's age (in years), the manager's educational level (1:Primary/2:High School/3:High School/4:University/5:Master's/PhD/6: Other option), and lastly, the ownership form (1:Rent/2:Own) [2,24,29,37,41,52,76,77].

According to the descriptive statistics of the above variables (Table 2), the largest percentage of small businesses are privately owned, while only 10.7% operate in rented facilities. Most managers are men (62%), with an average age of 49 (Table 1). Regarding the descriptive analysis of managers' education level, it emerged that 38.7% and 26.7% have completed their studies at the level of high school and university, respectively (Figure 4). As for the case of succession, 55.4% of managers answered positively (Figure 5).

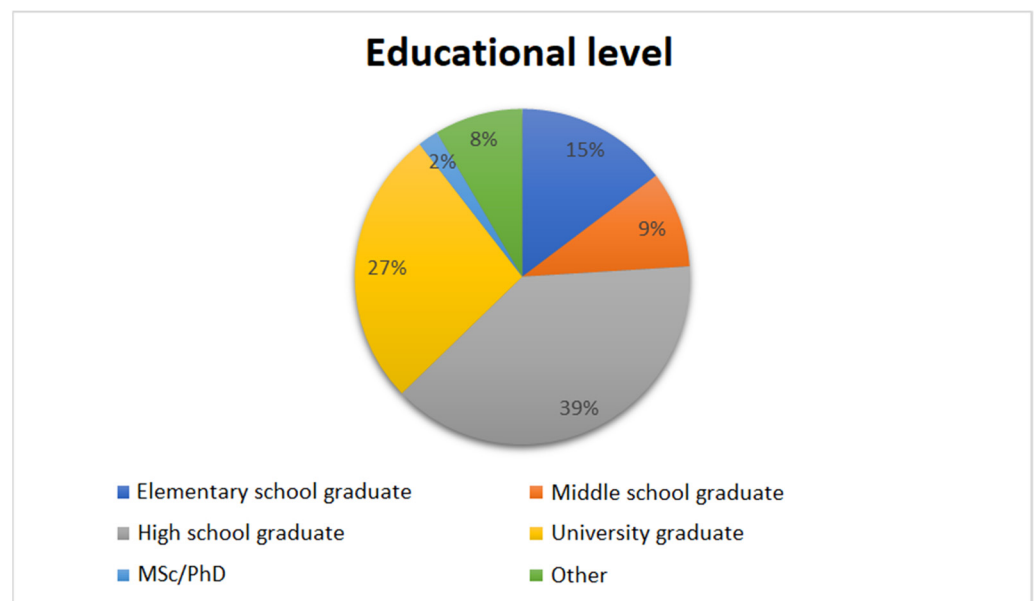


Figure 4. Managers' education level.

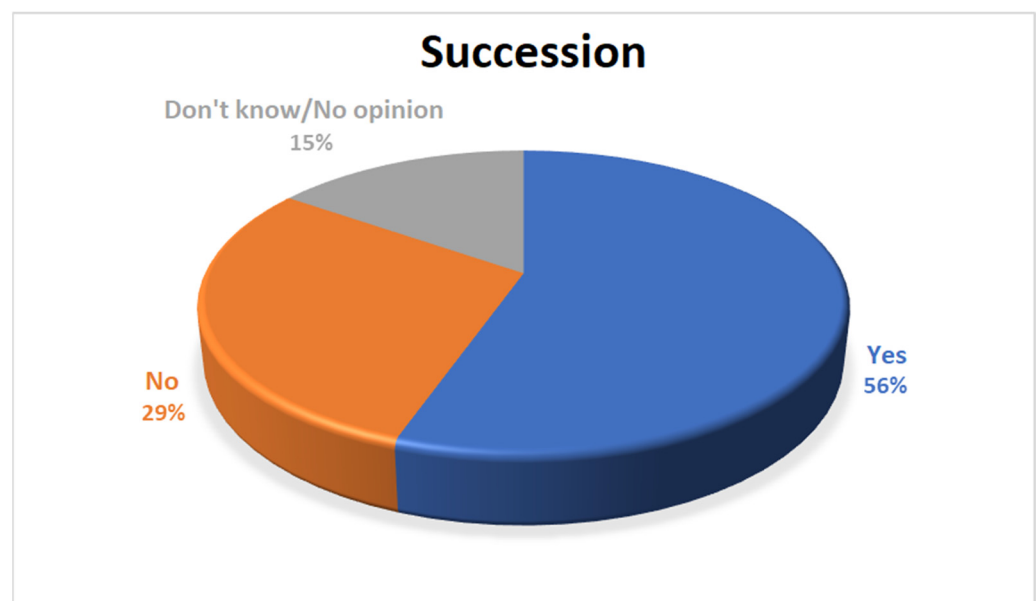


Figure 5. The case of businesses' succession.

Regarding the businesses' age, it was seen that the examined ones have operated for 13 years on average (Table 1) and most of them (59.3%) do not include agricultural activity

(Table 2). In terms of provided services, it appears that most of the examined businesses offer only the service of accommodation (52.7%) (Table 2).

Table 2. Descriptive statistics of the other variables used in the Truncated regression.

Variables	1	2
Ownership (1 = Rent 2 = Own)	10.7%	89.3%
Sex (1 = Male 2 = Female)	62.0%	38.0%
Agricultural Activities (1 = Yes 2 = No)	40.7%	59.3%
Business Type (1 = Simple 2 = Complex)	52.7%	47.3%

4. Results

Table 3 presents the results extracted after applying the VRS DEA and VRS Bootstrap DEA models. It was found that the average efficiency of the 150 small accommodation businesses participating in the survey reached a value of 0.493 (VRS DEA), while the corrected value was equal to 0.405 (VRS Bootstrap DEA).

Table 3. Descriptive statistics of efficiency and Bootstrapped efficiency scores.

Scores	VRS			
	Mean	SD	Min	Max
Efficiency	0.493	0.286	0.033	1
Bootstrapped Efficiency	0.405	0.219	0.024	0.837

These values obviously point out a low level of efficiency, something that is reinforced by the results presented in Table 4, where the majority of the businesses present low efficiency (<0.60). However, 18 businesses present an efficiency level equal to 1 (fully efficient) according to the DEA model results, while no fully efficient firm exists according to the Bootstrap DEA application.

Table 4. Number of businesses by efficiency categories.

Efficiency Score	DEA		Bootstrap DEA	
	Number of Businesses	% of Businesses	Number of Businesses	% of Businesses
0–0.59	101	67.3	111	74.0
0.60–0.79	22	14.7	33	22.0
0.80–0.991	9	6.0	6	4.0
=1	18	12.0	0	0.0
Total	150	100.0	150	100.0

Table 5 shows the results of the Truncated regression with a 95% confidence interval. This model is oriented to show inefficiency. Therefore, the parameters characterized by negative values indicate a tendency to improve efficiency levels operating as efficiency sources. In more detail, the variables concerning the provided services, the manager's age, and the ownership form present statistically significant relationships with the resulting efficiency level.

Except the manager's age, the rest of the variables showed positive values, indicating a negative impact on the businesses' efficiency. The variables' effects that express succession, the manager's sex, the business age, and a symbiotic relationship with agriculture were not statistically significant. The positive value of "business type", more specifically, indicates a decrease in the efficiency level and, in parallel, an increase in the activities provided.

Table 5. Results of the double-Bootstrapped Truncated regression analysis.

Explanatory Variables	Coefficient	LB *	UB **
Agricultural activities	−0.217	−0.545	0.221
Business type	1.178	0.965	1.723
Business's age	0.018	−0.007	0.047
Manager's age	−0.381	−0.628	−0.027
Education	0.025	−0.104	0.183
Succession	−0.004	−0.016	0.017
Sex	−0.304	−0.620	0.119
Ownership	0.343	0.179	1.346

* Lower Bound ** Upper Bound.

5. Discussion

This paper aimed to investigate the efficiency level of small accommodation businesses located in Greek non-coastal areas and to determine a set of factors that may affect them, from the perspective of the three dimensions of family businesses (family, business, and ownership). The resulting efficiency was considered low on average since, in both cases—efficiency and Bootstrapped efficiency model construction—it did not exceed 49.3%, as can be clearly seen in Tables 3 and 4. These results are similar to other relevant studies' results in the field of agritourism and short-stay businesses located in rural areas [2,15,16,20,37]. Nevertheless, they come into contradiction with related studies in the scientific field of the hotel industry [24].

Thus, it could be hypothesized that small accommodation businesses are less efficient because they lack managerial skills and innovation and are more lifestyle-oriented [16,43] since they have family characteristics and aim at securing future work for the successors and strengthening the family profits. This fact is reinforced by the fact that the present analysis variables were taken into account following the aspects of the three-dimensional model of family businesses (family, business, and ownership) [33–35].

Regarding the second stage and, more specifically, the influence of various factors on the efficiency level, it emerged that the factors of business type—provided services—(simple/complex), the manager's age (in years), and the ownership form (Rent/Own) may statistically and significantly affect the efficiency in contrast with the rest of the examined factors such as the manager's education level, the case of succession, the manager's sex, the business's age, and the symbiotic relationship of the agricultural and tourism activities of managers. Nevertheless, the values of the factors, as can be seen in Table 5, are worthy of discussion because they can act as a means of quoting managerial and operational propositions to the entrepreneurs of the tourism and hospitality business sector.

To be more precise, the positive value of “business type” indicates the efficiency decrease under the assumption that the provided activities increase. Consequently, through the review of the literature findings, it could be argued that the businesses that provide only accommodation services show higher efficiency than those that offer complex services [2,71] such as food and beverage provision, sports, recreational and/or agricultural activities, etc., in accommodation businesses located in Greek non-coastal areas. In many cases and as the modern literature projects support [29,78–80], the accommodation services' provision is uniquely exercised in order to increase family income.

The positive value of the “ownership” factor indicates an efficiency decrease in the case that a non-ownership relationship with the facilities and equipment of the small accommodation businesses exists. This fact can be attributed to the manager's emotional connection with the small accommodation business's assets, as also reported in the study of [14]. In agriculture, however, this kind of emotional connection has not been studied in depth and is considered more strictly something that is proven reviewing the current studies of the literature. Theodoridis et al., (2017) [52], for example, argue that the existence of ownership is considered mainly as a determinant of the ability of the farmer/manager to convert inputs into outputs with the aim of generating profits. At this point, it should

be taken into account that the “ownership” factor has not been studied empirically in the field of hospitality and tourism, something that could be considered an innovation for this particular research project.

Lastly, the negative value of the explanatory variable “manager’s age” can be attributed to the fact that the existence of younger managers contributes incrementally to the efficiency level. After all, it is argued that younger managers are willing to adopt new practices and innovations, are more active, and have more passion and motivation as they have higher career aspirations [41], something that could essentially contribute to the accommodation businesses’ extension and development.

6. Conclusions

Aiming to investigate the efficiency level of Greek small accommodation family businesses taking into account the three dimensions’ perspective (family, business, and ownership), a corresponding analysis was conducted through the implementation of the Data Envelopment Analysis (DEA) method. Defining, at the same time, a set of factors and studying their influence on the level of efficiency, this research reached essential conclusions, especially for the hospitality and tourism sector in Greek non-coastal areas.

The above-mentioned research purpose emerged from reviewing the literature as a corresponding analysis regarding the three dimensions of family businesses has not been implemented before. The method adopted was that of two-stage DEA, which was implemented on a set of 150 small accommodation businesses located in the region of Central Macedonia (Greece). During the first stage, Bootstrapped DEA was implemented in order for the efficiency to be estimated. The variables that were taken into account as the inputs express each of the three dimensions, while the output variable was that of total revenues. In the second stage, Bootstrap Truncated regression was used in order to identify the effect of various factors on the resulting efficiency level. The above-mentioned information shows the current study’s innovation as it is the first time that the triple dimensionality has been studied methodologically and not theoretically.

The first stage’s results showed that the majority of the examined businesses’ presented low efficiency, which contrasts with the literature findings regarding the standard hotels. This fact could lead to the hypothesis that small accommodation businesses are less efficient because they lack managerial and innovation skills, since they are more life-style-oriented. In this way, a proposal for further research could arise since the efficiency of large hotel units is considered worthy of investigation in order to verify the above comments and to make more management proposals in the future. Regarding the second stage, only the manager’s age, ownership form, and business type influenced the efficiency level.

Regarding the “business type” factor, it emerged that the provision of hospitality was carried out mainly to enhance family income. Common sense could be used in this case since the Greek managers choose to create an accommodation business in order to generate profit, achieve sustainability, offer financial security to their successors, and preserve family property. It also emerged that the existence of privately owned—and not rented—infrastructure contributed positively to the small accommodation businesses’ efficiency. Regarding the manager’s age, it emerged that the younger a manager is, the more efficient the business becomes. This result can be explained by the fact that younger people are more active and innovative.

It is worth mentioning that fulfilling the current objective aim, a significant contribution to the literature and especially to the hospitality field is offered. First, it could be said that the creation of a model based on the three dimensions of the family business contributes particularly to the relevant literature since it has been applied for the first time at a level of a research article. The paper’s contribution is essentially derived through managerial–operational proposals that support the offer of limited services, the existence of ownership, and the trust in younger managers, which can lead to higher efficiency and sustainability, facts that could lead also to the businesses’ and areas’ profitability. Addition-

ally, it helps in policy-making as all of the three dimensions of family businesses (family, business, ownership) should be taken into account.

Conducting this research study, various limitations came up. One of the most-significant limitations was that of the study area, which was selected because of the easy access to the data. This choice may have been justified with the help of evidence from the literature [65], but essentially gives an opportunity to other researchers to implement corresponding research in other Greek regions in order for more conclusions to be obtained. Regarding this specific issue, it is not clear if these results are applicable to different countries. For this reason, the authors were led to the conclusion that this study can be a guide—regarding the methodology used and the variables choice—for a corresponding investigation by researchers abroad. It should also be pointed out that the age of the data (2018–2019) does not clearly describe the impact of COVID-19 on the Greek small accommodation family businesses. Consequently, a proposal for more recent research is considered necessary. Another limitation concerns the selected—through the literature—variables on which the present analysis was based. The inclusion of different variables such as the health quality [81], environmental sustainability [82], and political instability [83] might have more positively influenced both the efficiency and the values of the factors. Nevertheless, through this limitation is provided one more research proposal in order for the above hypothesis to be proven.

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