UNIVERSITY OF LJUBLJANA

FACULTY OF ECONOMICS

DIPLOMA THESIS

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MEASURING THE EFFICIENCY OF SLOVENIAN HOTELS

Ljubljana, September 2008 **TADEJ FEKONJA**

STATEMENT

I, the student **Tadej Fekonja**, hereby declare that I am the author of this diploma paper which I have written under the supervision of **Ass. Prof. Dr. Ljubica Knežević Cvelbar** and I authorise the text to be published on the faculty's website.

In Ljubljana, September 10, 2008 Signature: _____

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INTRODUCTION

Today's economy with its global markets and fierce competition is forcing managers to be open-minded and proactive in implementing new methods, techniques or practices to increase or add value to products and services. Nevertheless, ultimately this all leads to the maximisation of profit. While there are several ways to boost it, one of the most vital and current ones is to increase a company's business efficiency. When an organisation improves its business efficiency, it maximises its benefit and profit, while minimising its effort and expenditure. Maximising business efficiency involves a balance between two extremes. A company that is managed correctly reduces its costs, waste, and duplication; if not, managers must sacrifice profits and be inefficient. Nowadays, competition within the industry is still imperfect and therefore managers in, for example, the industry are not forced to be efficient to survive (Anderson, Fok & Scott, 2000). Yet the hospitality industry has some characteristics of oligopoly competition. With a small number of sellers, demand per hotel is still high enough for managers to afford certain inefficiencies.

Nevertheless, cautiousness is required in attempts to raise efficiency. For instance, if one lowers the number of employees too much this could have a direct and negative effect on service quality. Therefore, guest satisfaction would drop and, in turn, the number of guests, resulting in lower revenues. Further, one needs to find a perfect balance between inputs and outputs and determining this is a unique and long-lasting process of every decision-making unit.

The goal of this study is to assess the performance of five Slovenian hotel groups and 21 Slovenian hotels in the 2005-2007 period. In order to do this, we calculated the total factor productivity change composed of technological change and technical efficiency change for hotel groups and for individual hotels. Afterwards, we compared these decision-making units with others and provide instructions to improve them if they are inefficient.

The purpose of this study is to examine the Slovenian hospitality industry with a view to making it more efficient. With the given inputs, decision-making units will sooner or later be forced to maximise their outputs in order to remain competitive in the global tourism market. The driving factors are, of course, top managers who have power over decisions of such importance. However, the study helps managers understand the significance of efficiency and encourages them to implement whichever directive is suitable for improving the unit's efficiency.

This diploma paper is organised as follows. There are four sections. Each section has two chapters. In the first section, the Slovenian tourism and Slovenian hospitality industry are analysed. In order to present the circumstances of Slovenian tourism to the reader, a quick overview of Slovenian history is given. Moreover, the current situation facing Slovenian

tourism is studied thoroughly by obtaining current »tourism data« from the Statistical Office of the Republic of Slovenia (SORS). The second part of this section examines the state of the Slovenian hospitality industry and asks whether it is performing successfully.

The second section is more theoretically based. The first chapter presents a review of the literature that refers to the use of the DEA model in the hospitality industry, while the second one more fully explains the DEA methodology relevant to the aims of this paper.

In the third section some basic variables are discussed. The first part of this section addresses the data used in this study, whereas the analysed hotel groups are presented. In the second part, inputs and outputs are discussed. To study the relationships among them a correlation analysis is performed.

In the first part of the last section the empirical results and interpretations are provided, followed by the conclusion.

1 SLOVENIAN TOURISM

Slovenia is a small Central European country, located between “Eastern” and “Western Europe”, with a population slightly over 2 million. Key milestones for the Slovenian economy are 1991 when Slovenia seceded from the former socialist Yugoslavia and became an independent country, 2004 when Slovenia became an EU member and 2007 when the euro was introduced as its currency. In the 15 years of the country’s independence the Slovenian economy has undergone substantial changes from a socialist system and made significant progress (Mihalič & Knežević Cvelbar, 2008). GDP growth rates since 1993 have been between 3 and 5 percent (Kračun, 2006). The 10-day war for independence had a remarkable effect on Slovenian tourism. Moreover, it caused a significant decrease in arrivals and overnight stays of foreign tourists in Slovenia for several years. The number of tourist arrivals in 1989 was only reached again in 2000. The short war was not the sole reason for the big drop in visitor numbers to this little ex-socialist country as there were several other reasons: a lack of brand awareness, the country’s close proximity to the Balkan crisis, the turbulent internal political and economic transition process, and the over-maturity of the Slovenian tourism product.

In the past couple of decades tourism has been growing twice as fast than average economic growth. A similar phenomenon has occurred in Slovenia as well. In 2006 almost 81,000 beds were available for tourists at tourist establishments. 42.6% of those were available in hotels and similar establishments (motels, boarding houses, overnight accommodation, inns) and 57.4% in other accommodation facilities (apartments, camping sites, tourist farms with accommodation, private accommodations, mountain huts, company vacation facilities, vacation facilities for youth etc.). Compared to the year before, in 2006 the number of beds in

hotels and similar establishments grew by 4%. They provided accommodation for slightly fewer than 2.5 million tourists who spent over 7.7 million nights. The number of tourist arrivals rose by 4% and the number of overnight stays by 2% from 2005 to 2006. Foreign tourists represent two-thirds of all tourists who made an overnight stay in Slovenia, with the other one-third being represented by domestic tourists. Moreover, the majority of foreign tourists came from the following countries: Italy (19.8%), Austria (14.9%), Germany (13.9%), followed by Croatia, the United Kingdom, France and the Netherlands. Slovenia as a destination has significant characteristics of seasonality whereby summer months are the most attractive for tourists. From June to August, 37.6% tourist arrivals were recorded. Further, all major tourist trade occurs during the summer months, primarily at tourist destinations offering sun and sea. On average, tourists spend 3.1 nights in Slovenia (SORS, 2008).

2 THE SLOVENIAN HOSPITALITY INDUSTRY

There are about 26,682 hotel beds, 130 hotels and less than 100 hotel firms in Slovenia. More than half of them (55%) are concentrated in the country's seaside and mountain resorts. The hospitality industry in Slovenia is, despite its privileged growth of income and physical indicators, still unsuccessful. In most of the monitored years from 2000 to 2004 a loss instead of a profit is found. The gross margins are significantly higher in competitive foreign hotels and in the Slovenian economy as a whole. Moreover, the share of profit in hotel revenues was negative in 2000, 2001 and 2004. The only positive value was achieved in 2003 (4.42%), whereas the average Slovenian company recorded 1.86% in the period from 2000 to 2004. Consequently, indicators such as EBIT (earnings before interest and taxes), ROA (return on assets), ROE (return on equity) and profit margin were also negative in the period from 2000 to 2004, placing the Slovenian hospitality industry in one of the last places in comparison to other competitive hospitality industries across Europe. If we compare such indicators of Slovenian hotels with the indicators for the largest three European hotel chains (ACCOR, HILTON, INTERCONTINENTAL) we obtain a result causing similar concern (Kavčič, 2005). The hospitality industry is in a subordinate market position as profit rates and gross wage rates in this sector are lower than the average values in the economy (Tajnikar & Pušnik, 2008). A negative trend can also be seen in financial indicators (Kavčič, 2005). Further, Knežević Cvelbar and Mihalič (2007) found that hotel companies are underperforming in comparison to other companies in the Slovenian economy.

Several hotels are still owned by the state since the privatisation process was much slower in the hospitality industry than in other sectors of the Slovenian economy. However, two trends in the Slovenian hospitality industry can be detected: the declining ownership of the state funds, investment funds and employees and the growing ownership of domestic companies. On one hand, there is still a strong presence of state and investment funds and under-proportional foreign ownership on the other. It is likely that foreign investment would improve the performance of Slovenian hotels since that would bring in new ways of

governing, implement new strategies, boost the internationalisation process and raise the competitiveness of the Slovenian hospitality industry as a whole (Mihalič & Knežević Cvelbar, 2008).

To summarise, tourism is positioned to become one of the leading branches of industry in the Slovenian economy in the following years, thus making a significant contribution to achieving the country's development objectives (Development Plan and Policies of Slovenian Tourism 2007-2011). On the other hand, the Slovenian hospitality industry is still financially and economically unsuccessful. The main reason lies in its high costs followed by the lack of know-how, quality employees, favourable state development incentives, unrecognised brands and a poor internalisation strategy. Moreover, compared with some of Europe's largest hotel chains Slovenian hotels are in a subordinate position. The causes of this are found within firms and in their economic environment (economic factors controlled by the government – taxes etc.). Slovenian hotels cannot avoid the wave of globalisation, internationalisation and standardisation in the global tourism and hospitality industry. A downfall is inevitable if past operations continue into the future – put simply, changes are required.

3 REVIEW OF THE LITERATURE

Measuring efficiency and performance in the hospitality industry has been in the focus of researchers for almost three decades. The leading researchers in this field prepared studies ranging from a classical ratio analysis and/or aggregate indices of market performance, through break-even analysis and the utilisation of yield management analysis etc. to the most recent approach – Data Envelopment Analysis (DEA). Previous studies that employed DEA to investigate the relative efficiency of the hospitality industry are described in chronological order as follows.

Some of the first to use DEA in tourism to measure the relative efficiency of 31 travel departments in the United States were Bell and Morey (1995). They provided several suggestions for travel departments to lower travel costs without any changes in their operating environment and/or demand for their services.

Morey and Dittman (1995) implemented DEA to test general managers' performances of 54 owner-managed hotels of a nationally known chain geographically dispersed over the continental United States. They found that general managers were operating with an average 89% efficiency and the least efficient manager with 64%. Yet overall their study provided evidence that the market for the hospitality industry seemed to be operating efficiently.

Table 1: Previous studies that used the DEA model in the hospitality industry

Research	Model	Units	Inputs	Outputs
Morey and Dittman (1995)	DFA-CCR	54 owner-managed hotels of continental United States, 1993	1) number of rooms 2) average occupancy rate 3) average daily rate 4) number of employees 5) resource expenditures	1) year's total room revenue 2) physical facilities – satisfaction index 3) services-satisfaction index
Anderson, Fish, Xia and Michello (1999)	Stochastic Frontier Approach (SFA)	48 hotels (motels) of the United States, 1994	1) average employee annual wage 2) average price of a room 3) average price of food and beverage operations 4) average price of casino operations 5) average price of hotel operations 6) average price of other expenses	1) total revenues generated by various hotel services
Anderson, Fok and Scott (2000)	DEA-CCR and DEA-BCC	48 hotels (motels) of the United States, 1994	1) average price of a room 2) average price of an employee 3) average price of food and beverage operations 4) average price of casino operations 5) average price of hotel operations 6) average price of other expenses	1) total revenues generated by various hotel services
Tsaur (2000)	DEA-CRR	53 international tourist hotels of Taiwan, 1996-1998	1) total operating expenses 2) number of employees 3) number of rooms 4) total floor space of the catering division	1) total operating revenues 2) number of rooms occupied 3) average daily rate 4) average production value per employee in the catering division
Hwang and Chang (2003)	DEA-CCR and Malmquist productivity index	45 international tourist hotels of Taiwan, 1994, 1998	1) number of full-time employees 2) guest rooms 3) total area of the catering department 4) operating expenses	1) room revenue 2) food and beverages revenue 3) other revenues

To be continued…

Continuation…

Research	Model	Units	Inputs	Outputs
Chiang, Tsai and Wang (2004)	DEA-BCC	25 hotels of Taipei, 2000	1) hotel rooms 2) food and beverage capacity 3) number of employees 4) total cost of the hotel	1) yielding index 2) food and beverage revenue 3) miscellaneous
Barros and Alves (2004)	DEA and Malmquist productivity index	42 hotels of Portugal, 1999-2001	1) number of full-time equivalent workers 2) cost of labour 3) book value of property 4) operating costs 5) external costs	1) sales 2) number of guests 3) nights spent in the hotel
Sun and Lu (2005)	DEA-SBM, output-oriented SBM Malmquist approach	55 international tourist hotels of Taiwan, 2001	1) total operating expenses 2) number of employees 3) number of guest rooms 4) total area of the catering department	1) total operating revenues 2) average occupancy rate 3) average daily rate 4) average production value per employee in the catering department
Yang and Lu (2006)	DEA	56 international tourist hotels of Taiwan, 2002	1) total operating expenses 2) number of employees 3) number of guest rooms 4) total area of the catering division	1) total operating revenues 2) average occupancy rate 3) average room rate 4) average production value per employee in the catering division 5) average production value of the catering division

Source: Own summary of various papers applying DEA in the hospitality industry.

Anderson et al. (1999) used the stochastic frontier approach in order to measure the managerial efficiency of 48 hotels in the United States. They were operating with an average 89.4% efficiency and where the most efficient hotel was 92.1% efficient. The study proved Morey and Dittman's conclusion that the hospitality industry is operating at relatively efficient level.

In the following year, Anderson et al. (2000) incorporated an even more detailed and comprehensive approach to measure the efficiency using the DEA. They divided efficiency into technical and allocative efficiency. Moreover, they divided technical efficiency into pure and scale efficiency. Surprisingly, when using the same data as a year before they got completely different results. Firms were only operating at 42% efficiency on average meaning that companies could reduce their input costs by up to 58%. Their work revealed the hospitality industry to be nearly perfectly competitive and efficient.

Tsaur (2000) employed DEA to measure the operating efficiency of 53 international tourist hotels of Taiwan using operating data for 1996-1998. The study reported that managers were operating with 87.33% efficiency, the most efficient hotel improved its efficiency by 13.2% from 1996-1998 and concluded that the Taiwanese market for hospitality services seems to be operating efficiently.

Hwang and Chang (2003) utilised the DEA and Malmquist productivity index suggested by Färe et al. (1994). They measured efficiency on the basis of data collected in 1998 and the change in efficiency of hotels from 1994-1998. Hotels were operating with 79.16% efficiency and only 20 out of 45 hotels increased their efficiency over the four-year period. Finally, they were able to partition the entire industry into six clusters based on relative managerial efficiency.

Chiang et al. (2004) measured the efficiency of 25 hotels in Taipei using data from 2000. The research neglected the thesis that Taipei's franchised or managed international tourist hotels performed more efficiently than independently owned ones.

Barros and Alves (2004) evaluated the efficiency of 42 publicly owned Portuguese hotels managed by Enatur. They used the Malmquist productivity index to measure the efficiency change in the hotels' operations from 1999-2001. Over that period only a few hotels improved their efficiency since they revealed a deficit especially in technical and technological efficiency in the hotels' operating environment.

Sun and Lu (2005) assessed the performance of 55 international tourist hotels in Taiwan in 2001. They estimated and compared them with others in terms of managerial, occupancy and catering efficiency. Several significant findings were made: 1) marketing for hospitality services was not undertaken efficiently in 2001; 2) the hotels operated poorly at both the levels of occupancy and catering efficiency in 2001; 3) there was a weak tendency for a hotel

with a relatively high catering efficiency to operate with a high occupancy efficiency; 4) approximately 61.76% of the hotels had annual productivity changes over time and 5) the managerial efficiency of the hotels was influenced by the floor space of catering departments, the number of guest rooms, the close proximity of a hotel to the CKS international airport and the number of employees.

Finally, Yang and Lu (2006) proposed an alternative DEA method to examine the managerial performance, input congestion and the benchmarks of 56 Taiwanese international tourist hotels (ITHs) in 2002. They ascertained that: most ITHs operate with decreasing returns to scale, nothing that the ITHs were facing a highly competitive environment; international chain ITHs are generally more efficient than independently owned ones; ITHs in resort areas operate slightly better than those in metropolitan areas; ITHs that are closer to the CKS international airport operate slightly worse on average than those far away from it; inefficient ITHs lack the ability to integrate their resources; and efficient international chain ITHs are able to more easily become benchmarks. Table 1 (*p*. 5) presents the characteristics of these main studies using DEA to measure efficiency in the hospitality industry.

4 THEORETICAL REVIEW

To calculate efficiencies with the frontier approach many different methods have been applied in the past 40 years. The two principal and most commonly used ones are:

1. data envelopment analysis (DEA); and
2. stochastic frontiers.

Both involve mathematical programming and econometric methods. This paper is concerned with the use of the DEA method. DEA involves the application of linear programming methods to construct a non-parametric piecewise surface (frontier) over the data so as to be able to calculate efficiencies relative to this surface. All of the observed points lie on or below the production frontier. Those that lie on the curve represent units which are 100-percent efficient. Further, the frontier “envelops” the less efficient units. It is used to empirically measure the productive efficiency of decision-making units (or DMUs). There are several benefits of employing DEA compared to other methods:

1. there is no need to explicitly specify a mathematical form for the production function;
2. they are proven to be useful in uncovering relationships that remain hidden to other methodologies;
3. they are capable of handling multiple inputs and outputs;
4. they can be used with any input-output measurement; and
5. sources of inefficiency can be analysed and quantified for every evaluated unit.

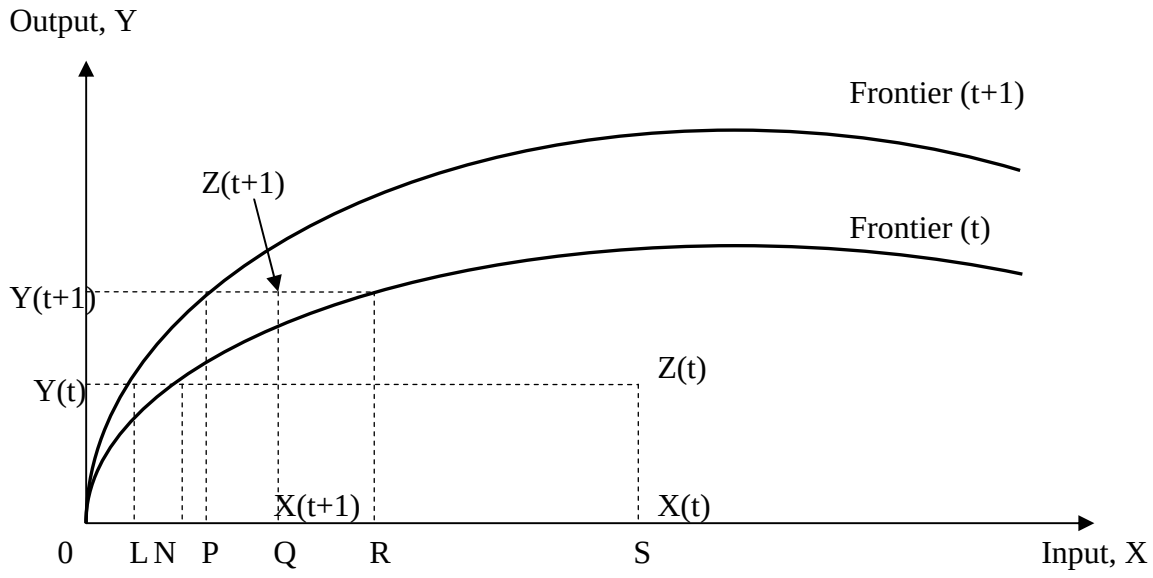
DEA allows the assessment of contingent productivity which takes into account each hotel’s (or restaurant’s) performance while controlling for differing environmental or situational

factors. Analysts can use the best performing units as a reference for the other ones. However, DEA looks to optimise the output measure of each unit given the inputs used. The focus is on each individual variable of every individual unit that may be affecting that unit's productivity. DEA makes the identification of each inefficient unit more explicit in order to help managers focus on specific management actions. On the other hand, DEA does not make any assumptions about what form the function will take (in the case of a linear regression it produces a straight line; it can be any shape at all) (Reynolds, 2003).

Charnes, Cooper and Rhodes (1978) formulated a model which came to be the first DEA model to be widely applied. They proposed an input-oriented CRS (constant returns to scale) model. Afterwards, Banker, Charnes and Cooper (1984) considered an alternative set of assumptions and proposed a variable returns to scale (VRS) model. When one has panel data one may use DEA-like linear programmes and a specific section of DEA which can be input- or output-based called the Malmquist TFP index to measure any productivity change (Coelli, 1996).

In this diploma paper, in order to measure and calculate the efficiency of Slovenian hotels we used the last option above – the Malmquist productivity index. The idea behind efficiency analysis is to employ data collected from firms to derive the "best-practice frontier". It is very important that changes over time are considered in the process of efficiency measurements. Malmquist DEA derives an efficiency measure for one year relative to the prior year, while allowing the best frontier to shift (normally upwards).

Figure 1: Measure of productivity through the potential production frontier



Source: C. P. Barros, Evaluating the Efficiency of a Small Hotel Chain with a Malmquist Productivity Index, 2005, p.177, Figure 2.

In Figure 1 (*p.* 9) a simple one-input and one-output production frontier is presented. This frontier represents the efficient levels of output by that can be produced from a given level of input x. The diagram depicts two production frontiers of hotel Z that uses inputs X an X+1 in periods t and t+1 to produce the outputs Y and Y+1. Between the time t and t+1 the frontier shifts from Frontier t to Frontier t+1. If the hotel is technically efficient it produces the maximum output attainable along the potential frontier.

However, a hotel which produces at point Z(t) is technically inefficient since it lies below the production frontier. In order to make the hotel's production technically efficient, the bundle Z(t) should be reduced by the horizontal distance ratio 0N/0S. If we want to compare the situation with the period t+1, Z(t+1) has to be multiplied by the horizontal distance ratio 0Q/0R to obtain a comparable technical efficiency. Further, Z(t+1) is now situated above frontier t but it is still inefficient since the production frontier has shifted in time from t to t+1. In order for Z(t+1) to be efficient in period t+1, it must be reduced by the horizontal distance 0P/0Q. Hence, a Malmquist productivity index can be constructed with the ratio of these two distance corrections between period t and t+1, where:

$$MPI = \frac{0R/0Q}{0N/0S} = \frac{Q(t,t+1)}{Q(t,t)} \qquad (1)$$

The Malmquist productivity index can be further analysed and decomposed into technical efficiency change (ECH) and technological change (TECH) relative to the frontier:

$$ECH = \frac{Q(t+1,t+1)}{Q(t,t)} = \frac{0P/0Q}{0N/0S} \qquad (2)$$

$$TECH = \frac{Q(t,t+1)}{Q(t+1,t+1)} = \frac{0R/0Q}{0P/0Q} \qquad (3)$$

However, the movement of a production frontier can be caused either by a catching-up effect, when firms catch up to their own frontier (a change in technical efficiency), or a frontier switch when the frontier switches upwards (a change in technology).

Application of the Malmquist productivity index helps us calculate indices of total factor productivity (TFP) change; technological change, technical efficiency change, pure technical efficiency change (PTC) and scale efficiency change (SEC). Technical efficiency change, though, is a product of pure technical efficiency change and scale efficiency change.

$$TECH = PTC * SEC \qquad (4)$$

Malmquist based his index on the output distance function, defined as:

$$d^T\left(x^t, y^t\right) \equiv \inf\left[\theta : \left(x^t, \frac{1}{\theta} y^t\right) \in S^t\right] \qquad (5)$$

Where x denotes a vector of inputs; y, a vector of outputs; S^t, the technology set; superscript T, the technology reference point (T=t or T=t+1); and 1/θ, the amount by which outputs in year t could have been increased given the inputs used had the technology for year T been fully utilised.

Färe et al. (1994) specified an output-based Malmquist productivity index as

$$M\left(x^{t+1}, y^{t+1}, x^t, y^t\right) = \left[\frac{d^t\left(x^{t+1}, y^{t+1}\right)}{d^t\left(x^t, y^t\right)} \times \frac{d^{t+1}\left(x^{t+1}, y^{t+1}\right)}{d^{t+1}\left(x^t, y^t\right)}\right] \qquad (6)$$

It is noted in the above equation that a change in time is considered. The equation represents the productivity of the production point (x_{t+1}, y_{t+1}) relative to the production point (x_t, y_t). A value greater than one indicates positive TFP growth from period t to period t+1. In fact, the equation is combined from the geometric mean of two output-based Malmquist indices. The first one considers period t technology and the second one period t+1 technology.

Further, Färe et al. (1994) factorised this equation into the product of technical change and technological change as:

$$M\left(x^{t+1}, y^{t+1}, x^t, y^t\right) = \frac{d^{t+1}\left(x^{t+1}, y^{t+1}\right)}{d^t\left(x^t, y^t\right)}\left[\frac{d^t\left(x^{t+1}, y^{t+1}\right)}{d^{t+1}\left(x^{t+1}, y^{t+1}\right)} \frac{d^t\left(x^t, y^t\right)}{d^{t+1}\left(x^t, y^t\right)}\right]^{1/2} \qquad (7)$$

The important matter of Equation 7 is that Malmquist index can be decomposed into two independent components namely, efficiency change and technological change. Further, ratio outside the brackets gives us the change in technical efficiency between year t and t+1, the bracketed one indicates the index of change in technology between two periods evaluated at x^t and x^{t+1}. Thus 7 can be written as

$$M\left(x^{t+1}, y^{t+1}, x^t, y^t\right) = \text{ECH} * \text{TECH} \qquad (8)$$

Moreover, product of technical efficiency change and technological change give us Malmquist total factor productivity growth (TFP).

There are two ways of measuring the Malmquist productivity index. Firstly, it can be measured with the distance function and secondly, it can be measured with the reciprocal of the input distance function $\theta(x,y) = [1/d(x,y)]$. The reciprocal is the smallest ratio by which an input bundle can be multiplied and still be capable of achieving a given level of output. If we apply Farrell's (1957) measure of technical efficiency to estimate the Malmquist index, we can define whether it obtains productivity growth ($M>1$) or a productivity regression ($M<1$). The same occurs with the Malmquist index (TFP) change: if a certain firm in period t+1 scores a TFP change higher than 1 it has gained in total productivity from period t to t+1. On the other hand, if a company scores a TFP change lower than 1 then the total productivity decreased in the period under analysis. A TFP change score which equals 1 points out that there have not been any changes in TFP from period t to t+1.

We can decide whether we orientate our efficiency measures to inputs or outputs. One should select an orientation according to which quantities (inputs or outputs) managers have the most control over. Where input quantities appear to be the primary decision variable and where DMUs have particular orders to fill (e.g. electricity generation), analysts tend to select input-oriented models. The Input-oriented technical efficiency measure addresses the question: "By how much can input quantities be proportionally reduced without changing the output quantities produced?". Some industries are different – companies are asked to produce as many outputs as possible out of the inputs given. In this case an output orientation is more appropriate. The hospitality industry has similar characteristics and that is why we will concentrate our attention on outputs. Alternatively, our calculations will be based on the question: "By how much can output quantities be proportionally expanded without altering the input quantities used?"

Theoretically, it is assumed that production function of a fully efficient unit is known. In reality this is of course not the case. We have to take a fully efficient one from the sample and adopt it as the most efficient. In such conditions, the frontier relative to the sample is considered in the analysis. However, with the help of mathematical programming models a Malmquist productivity estimate of the frontier production function can be applied. For a further discussion of the DEA methods, refer to, see Charnes et al. (1994), Färe et al. (1994), Cooper et al. (2000), Coelli (1996), Coelli et al. (1998), Ray (2004), Sowlati (2005) etc.

5 SAMPLE DATA

In this study we measured the total factor productivity change (TFP) of hotels presented individually of five Slovenian hotel chains. With Malmquist's productivity index we monitored their changes in efficiency for the period from 2005 to 2007. We calculated the mean efficiency value of every group of hotels (hotel chain) and we compared them with others in the sample. We defined which hotel chain has been the most efficient and which the least. Further, we calculated the efficiency of every individual hotel and compared them with

others in a certain hotel chain and also with hotels from different chains. For this purpose, we obtained data from the following hotel chains or groups: the Grand Hotel Union group, LifeClass Hotels & Spa, Sava Hotels & Resorts, Metropol hotels and St. Bernardin hotels.

Table 2: Summary of hotel chains and hotels included in the study

Hotel chain	Hotels
Grand Hotel Union	Hotel Union**** in Hotel Lev*****
Lifeclass Hotels & Spa	Grand Hotel Portorož*****, Hotel Slovenija****, Hotel Riviera****, Hotel Mirna****, Hotel Apollo**** in Hotel Neptun****
Sava Hoteli Bled	Grand Hotel Toplice*****, Hotel Villa Bled****, Golf Hotel****, Park Hotel****, Garni Hotel Jadran*** in Trst hotel***
Hoteli Metropol	Grand Hotel Metropol*****, Hotel Roža****, Hotel Barbara*** in Hotel Lucija***
Hoteli Bernardin	Grand Hotel Bernardin*****, Hotel Histrion**** in Hotel Vile Park***

Source: Own summary of hotels in the sample.

5.1 The Grand Hotel Union group

The Grand Hotel Union group owns high-quality hotels located in the capital of Slovenia which incorporate two four-star hotels (Grand Hotel Union and Grand Hotel Union Garni) and the five-star Hotel Lev. The Grand Hotel Union group offers a total of 574 hotel rooms and 29 meeting rooms.

In this research we collected data from Grand Hotel Union and Hotel Lev. The four-star Grand Hotel Union is one of the oldest hotels in Ljubljana with over 100 years of tradition. It is located in the very heart of Ljubljana and is the largest convention centre in the city (STO, 2008). Hotel Lev is the only hotel in Ljubljana with five-star status. It is located in the very centre and business district of the city, just a few minutes' walk from the main sightseeing attractions and the old town of Ljubljana (Hotel Lev, 2008). The most frequent motive of a guest staying in one of the observed Grand Hotel Union group hotels is to do business.

5.2 LifeClass Hotels & Spa

The first Slovenian international hotel chain LifeClass Hotels & Spa, whose owner is the Istrabenz group, was established when Istrabenz Holding merged the two hotel companies Hoteli Morje and Hoteli Palace.

Within this research we obtained data for all six hotels: Grand Hotel Portorož, an excellent five-star hotel, and five four-star hotels (Slovenija, Riviera, Apollo, Mirna and Neptun). They are situated in the very heart of Portorož, in the centre of lively tourist activities and right next to the sea. The hotels are offer numerous services (an exclusive ambience, superb wellness facilities, diverse cuisine, unique thermal and wellness services, congress activity, a memorable wedding experience together with the rest of its rich and varied offer) to fulfil and satisfy even the most demanding client needs (LifeClass, 2008).

5.3 Sava Hotels & Resorts

Tourism is becoming one of the most important and developing departments of the Sava group. In the past few years the Sava group has become the proprietor of the following service-providing groups in Bled: the Golf group and Kamp Bled, d.d., Grand Hotel Toplice Bled, d.o.o. and G&P Hoteli Bled, d.o.o. They merged them to bring them under the common brand name Sava Hoteli Bled (SHB). SHB together with Panonske Terme (Terme 3000, Terme Radenci, Terme Ptuj, Terme Lendava and Terme Banovci (Panonske terme, 2008)) form the common tourism brand Sava Hotels & Resorts. Their advanced tourism programmes have assured the Sava group a competitive advantage and uniqueness in the domestic and Central European tourism markets. Sava Hotels & Resorts has become a synonym for quality in wellness, golf and congress tourism (Krupčič, 2006).

For purposes of this research we obtained data for all six hotels of the Sava Hoteli Bled group. The hotels are situated in Bled which is famous for its idyllic lake and island guarded by a medieval cliff-top castle. The Sava Hoteli Bled group consists of the following hotels: the five-star luxurious Grand Hotel Toplice, three four-star (Hotel Vila Bled, Golf Hotel and Park Hotel) and two three-star hotels (Garni Hotel Jadran and Trst Hotel) (Sava Hotels & Resorts, 2008).

5.4 Metropol hotels

The beginnings of the Metropol group date back to 1963 when the company moved from Piran to Portorož and, together with the gambling house Casino Portorož started to make part of a complete tourist offer under the name of Metropol Resort Casino. Nowadays, the whole tourist offer of the company Metropol Group d.d. is situated in Portorož and includes: the

main five-star Grand Hotel Metropol, Hotel Roža, Hotel Lucija, Hotel Barbara, camping site Lucija and the Taverna restaurant. In this study we included all four hotels: the five-star Grand Hotel Metropol, the four-star Hotel Roža and the three-star hotels Barbara and Lucija (Metropol group, 2008).

5.5 St. Bernardin hotels

The Bernardin hotel complex can be found on a green cape between Piran and Portorož. The first guests were able to visit the hotel complex in 1976 (Logar, 2002). The decision to aim towards mass tourism, a lack of investment and liquidity caused a downfall in quality and prices at the beginning of its activity. However, the reorganisation and renovation of all products (renovation of the hotels, construction of a convention and spa centre) have led to success. Today, St. Bernardin hotels are known as being the best convention centre in Slovenia (Romih, 2005).

For the purposes of this study we collected data for all three St. Bernardin hotels (Grand Hotel Bernardin, Hotel Histrion and Hotel Vile Park). The Grand Hotel Bernardin is a five-star hotel with the first and largest convention centre in Slovenia. Seminar guests represent 40% of all nights spent in the hotel. The Hotel Histrion acquired its four-star status in 2002 (H-Bernardin, 2008). It has a large spa complex which was built in order to reduce seasonal variations. The Hotel Ville Park consists of five villas: Barka, Galeja, Orada, Nimfa and Galeb. Four of these are categorised as a three-star hotel, while the last one – Villa Galeb – serves as an accommodation facility for the St. Bernardin hotels' employees (Romih, 2005).

To summarise, the final data sample consists of five hotel chains (groups) which represent 21 individual hotels. The companies represent a wide cross-section of hotels from various regions of the country (the majority is located at the seaside, the others can be found in Bled and Ljubljana). Regarding their size the hotels are quite heterogeneous. In terms of the number of rooms most of them represent medium-sized hotel firms, while several could be marked as a small or large-sized hotel. The average hotel has 143 rooms, 53 employees and 407 seats provided for guests in the catering division.

In order for the individual hotels to remain anonymous the following variables were introduced to represent them: the Sava group hotels are presented with the variable "u", the Metropol group hotels with the variable "v", the Lifeclass hotels with "w", the St. Bernardin hotels with "x" and the Grand Hotel Union group hotels with the variable "y".

6 INPUT & OUTPUT FACTORS

The main activity of the hotels is to offer guests a place to sleep and to serve them with food and beverages (Mihalič, 1997). Moreover, the hospitality industry has made significant progress in the past decade. The basic fulfilment of customers'' needs is no longer enough. In order to survive, hotels are implementing various services to impress their guests. Services such as convention venues, social activities, entertainment, shopping facilities, spa & wellness facilities etc. are becoming ever more important besides accommodation and catering. The main process of a hospitality unit is still the conversion of inputs of various resources into output. Output is a concrete measurement showing that an organisation has reached its objectives (Yang & Lu, 2006).

Cooper et al. (2001) suggested that the number of hotels in a sample should be at least triple the number of inputs and outputs considered. Therefore, we used four inputs and two outputs since the number of hotels considered in this study is 21 (21 > 3(4+2) =18). The input and output factors chosen are defined as follows.

Input factors

- Total operating expenses: an expense or expenditure is an outflow of money to another person or group to pay for an item, service or category of costs. Hotel activities cause the consumption of items or services and this means expenses for the firm. The sum of those deficits in the inputs used represents the total operating expenses. As a whole, they include salary and related expenses, catering costs, water and electricity expenses, service expenses, maintenance and repair costs, depreciation expenses, rent etc.
- Number of employees: this refers to the sum of working hours per year in the hotel divided by an 8 hour-workday, which equals the average number of employees who have been involved in the operation of a certain hotel.
- Number of guest rooms: this refers to the number of guest rooms that can be provided for rent by a hotel.
- Total capacity of the catering division: this refers to the total number of seats provided for guests by all off a hotel's catering facilities.

Input variables such as the number of guest rooms and total capacity of the catering division require high levels of investment and reorganisation. These two inputs are therefore constant for many hotels in the 2005-2007 period.

Table 3: Descriptive statistics for the hotels included in the research

	Mean	Std.Dev	Minimum	Maximum
Input Variables				
Total operating expenses in EUR (x_1)	2,971,330	2,718,762.655	143,063	11,165,000
Number of employees (x_2)	53	47	2	204
Number of guest rooms (x_3)	143	83	29	327
Total capacity (number of seats) of the catering division (x_4)	407	348	0	1,340
Output Variables				
Total revenues in EUR generated by various hotel services (y_1)	4,233,210	3,661,461.415	210,166	15,298,000
Number of guests (y_2)	19,809	20,673	4,057	101,975

Source: Own calculations.

Output factors

- Total revenues generated by various hotel services: revenue is income a company receives from its normal business activities, usually from the sale of goods and services to customers. In the hospitality industry, revenues represent income from guest rooms, catering services, laundry, stores, related operating income, service fees etc.
- Number of guests: this refers to the annual number of guests who have signed in the observed hotel's reception books.

In order to study the relationships between inputs and outputs we performed a correlation analysis. Correlation analysis is a statistical technique used to measure the closeness of the linear relationship between two or more variables measured on an interval scale. With DEA it is assumed that such relationships exist. The purpose of correlation analysis is to measure the strength of a relationship between two variables. The correlation coefficient cannot be greater than 1 or less than -1. As defined, the correlation is a number between +1 and -1 that reflects the degree to which two variables have a linear relationship. The closer the coefficient is to either -1 or 1, the stronger the correlation between the variables.

Table 4: Correlation coefficients between inputs and outputs

	Input variable				Output variable	
	X_1	X_2	x_3	x_4	y_1	y_2
X_1	1					
	P = —					
X_2	0.977	1				
	P = 0.000	P = —				
X_3	0.781	0.764	1			
	P = 0.000	P = 0.000	p = —			
X_4	0.586	0.558	0.673	1		
	P = 0.005	P = 0.009	p = 0.001	p = —		
Y_1	0.982	0.969	0.853	0.614	1	
	P = 0.000	P = 0.000	p = 0.000	p = 0.003	p = —	
Y_2	0.866	0.881	0.798	0.294	0.892	1
	P = 0.000	P = 0.000	p = 0.000	p = 0.195	p = 0.000	p = —

Sources: Own calculations using the SPSS computer programme.

All of the four inputs have positively associated two outputs. That means that a correlation between the variables exists. In addition, the correlation is in almost all cases very strong. The strongest correlation can be found between total operating expenses and total revenues generated by various hotel services, where the correlation coefficient is 0.982. As we may expect, for higher revenues we need to sell more and that also boosts the expenses. Surprisingly, the lowest correlation was calculated between the total capacities of the catering division and the number of guests. The correlation coefficient in this instance is 0.294. One would expect a higher score since to accommodate more guests you need to have bigger capacities. The answer lies in some of the smaller hotels in the sample that do not have their own catering facilities. Moreover, they share it with other hotels among their group.

The four inputs are also positively associated. Hotels that tend to increase one input will consequently increase the use of the other three inputs. Further, both outputs are positively associated. The correlation coefficient score among them is 0.892.

7 EMPIRICAL RESULTS AND ANALYSIS

The Slovenian hospitality industry has operated unsuccessfully since the country opted out of former Yugoslavia in 1991. Since 2004, when Slovenia became an EU member and part of the European market, the situation has slightly improved. Moreover, similar findings were made in this research as well.

In this study, we estimated an output-based Malmquist productivity index to calculate efficiencies in the 2005-2007 period. Inputs such as the number of rooms or catering capacity in the hospitality industry are more or less given. Huge investments are needed to change them. One could more easily and with a smaller investment affect outputs such as the annual number of guests, number of nights guests spend in the hotel or sales as a whole. However, the output-based orientation of the hospitality industry seems to be adequate, especially when it is assumed that hotels behave in an oligopolistic way. DEA allowed us to estimate a total factor productivity index (TFP) as a Malmquist index. The total factor productivity index was further decomposed into technical efficiency change (diffusion or catch-up effect) and technological change (innovation or frontier-shift effect). Further, technical efficiency change was broken down into scale efficiency change and pure efficiency change.

Barros (2005) interpreted the parts that compose the total factor productivity index (TFP) as follows:

- Technological change: a change in technology is a consequence of innovation, i.e. the adoption of new technologies by best-practice hotels. In order to increase the technological change index one should invest either in new technologies (procedures, techniques and methodologies) or in equal skill upgrades related to them. Therefore, technological change is about any investment that improves the total productivity of a productive unit. It arises due to capital accumulation.
- Technical efficiency: a change in technical efficiency is the diffusion of best-practice technology in the management of activity. This demands better investment planning, improved technical expertise, and the superior management and organisation of hotels. However, technical efficiency demands that any unit should allocate resources without waste. In reference to Figure 1, this means a movement towards the best-practice frontier. Such a movement is of course an improvement, while a movement away involves deterioration. In dynamic terms, an efficiency change (diffusion) reveals a change between two successive technical efficiency frontiers.
- Pure technical efficiency: the improvement in pure technical efficiency reveals that there were investments in organisational factors associated with the hotel management such as marketing initiatives, an improvement in quality, achievement of a better balance between inputs and outputs etc.
- Scale-efficiency change: a scale-efficiency change is larger than 1 when a hotel achieves a size that permits it to obtain economies of scale. Thus, a scale-efficiency change depends on the size of a hotel.

7.1 Interpretation of the results for the hotel groups studied

Table 5 presents the efficiency scores of the hotel chains studied. All groups in the data sample scored a TFP change higher than 1. Therefore, total productivity increased for every single group in the 2005-2007 period. Moreover, to satisfy the requirements of the previous sentence the product between technical efficiency change and technological change has to be higher than 1, whereas three out of the five hotel groups improved in technology and all of them improved in their technical efficiency.

Table 5: Malmquist index: TFP summary of the hotel chains (groups)

Hotel chain or group	Pure technical efficiency change (PTC)	Scale efficiency change (SEC)	Technical efficiency change (ECH)	Technological change (TECH)	Total factor productivity change (TFP)
Grand Hotel Union group	1.000	1.001	1.001	1.132	1.132
Sava group	1.006	0.996	1.003	1.039	1.042
Lifeclass hotels	1.038	1.000	1.039	0.989	1.029
Metropol group	1.008	1.004	1012	1.004	1.014
St. Bernardin hotels	1.000	1.016	1.016	0.994	1.011

Source: Own calculations using the DEAP 2.1 computer programme.

After running the DEA analysis the biggest TFP change in the 2005-2007 period was achieved by the Grand Hotel Union group with a TFP score of 1.132. Further, it made the biggest progress in technology. The Grand Hotel Union group concluded 2007 very successfully. It exceeded all the planned results for the mentioned year and every single strategic goal was carried out. With numerous marketing activities it strengthened its market shares in foreign countries. However, occupancy rates of the hotels which form the Grand Hotel Union group grew vigorously in 2007 and were the highest in the past 15 years. The number of nights guests spent in the hotels rose by almost 11% compared to the previous year. Nevertheless, the most significant item that affected the results in Table 5 (*p.* 20) was the change in the number of employees in one hotel. It lowered the number of its employees from 80 in 2006 to 59 in 2007 and at the same time increased its revenues by 17.6% in the same period (Annual Report 2007 [Grand Hotel Union group], 2008; Annual Report 2007 [Hotel Lev], 2008).

The group that improved most in technical efficiency in the 2005-2007 period was Lifeclass Hotels. The Istrabenz Tourism group and Lifeclass Hotels within that, exceeded the plan and substantially improved its performance compared to previous years (Annual Report 2007 [Istrabenz group], 2008) resulting in a relatively high ECH score of 1.039.

7.2 Interpretation of the results for individual hotels

Table 6 (*p.* 20) shows that for 14 out of 21 hotels the total factor productivity change (TFP) is higher than 1. The mean TFP score is 1.034 and therefore total factor productivity increased for most of the hotels studied and decreased only for seven of them. For the 2005-2007 period the mean value of every single variable observed is higher than 1. The average hotel therefore improved in all variables, resulting in a TFP score higher than 1.

However, in order to include every hotel in the interpretation we incorporated the method that Barros (2005) used to explain the results. Therefore, we contemplate four combinations of technical efficiency and technological change in which we placed hotels from the sample:

- There are hotels in which improvements in technical efficiency co-existed with improvements in technological change. In the first group, we can find eight hotels (y_2, w_1, u_5, u_3, y_1, u_6, x_1 and x_3). These hotels represent Slovenia's best-performing hotels in the 2005-2007 period. Moreover, they achieved or even surpassed their annual objectives in the period studied. To improve their technical efficiency they had to: allocate, integrate and finally apply the necessary inputs (low costs, low number of workers); take advantage of the capacity possibilities (number of rooms, total capacity of the catering division), upgrade organisational factors, maximise the outputs (revenues generated by various hotels services, number of guests and nights spent in the hotel) and harmonise the relationship between inputs and outputs in such a way that the quality of the service provided is still sufficient to please the customer. These hotels have not only improved in efficiency but show interest in innovations related to new investments.
- There are hotels in which improvements in technical efficiency co-existed with a decline in technological change. The second group is the most populated. In total, it contains nine hotels (v_4, u_2, w_4, w_3, v_2, u_1, x_2, w_6 and v_3). These hotels invested in an improvement of technical efficiency. They upgraded organisational factors and employed a sufficient mix of inputs and outputs, but without introducing new technologies and/or innovations which would improve organisational factors. These hotels must acquire new technologies or introduce new methods, techniques or practices to increase or add value to their products and services.
- There are hotels in which deteriorating technical efficiency co-existed with an improvement in technological change. The third group represents only two hotels (w_5 and v_1). These two hotels invested in new technologies but failed to find the right balance between their inputs and outputs. Further, hotels in this group could attain their goals at lower costs. To improve their efficiency in the future, they should generate more output without changing their inputs.

Table 6: Malmquist index: mean summary of hotels in the sample

Hotel	Pure technical efficiency change (PTC)	Scale efficiency change (SEC)	Technical efficiency change (ECH)	Technological change (TECH)	Total factor productivity change (TFP)
Y_2	1.000	1.001	1.001	1.170	1.171
W_1	1.079	1.008	1.088	1.053	1.145
U_5	1.000	1.000	1.000	1.123	1.123
U_3	1.000	1.000	1.000	1.112	1.112
V_4	1.110	1.007	1.118	0.991	1.107
Y_1	1.000	1.000	1.000	1.093	1.093
U_2	1.086	1.004	1.091	0.986	1.076
W_5	0.999	1.000	0.999	1.077	1.076
U_6	1.000	1.000	1.000	1.063	1.063
W_4	1.082	1.007	1.090	0.968	1.055
W_3	1.078	1.005	1.084	0.969	1.050
X_1	1.001	1.034	1.035	1.006	1.042
X_3	1.000	1.006	1.006	1.007	1.013
V_1	0.922	1.008	0.930	1.082	1.006
V_2	1.000	1.000	1.000	0.999	0.999
U_1	1.000	1.000	1.000	0.982	0.982
X_2	1.000	1.008	1.008	0.969	0.977
W_6	1.000	1.000	1.000	0.950	0.950
V_3	1.000	1.000	1.000	0.942	0.942
U_4	0.952	0.970	0.924	0.971	0.897
W_2	0.991	0.982	0.974	0.919	0.895
Mean	1.013	1.002	1.015	1.018	1.034

Source: Own calculations using the DEAP 2.1 computer programme.

- Finally, there are also hotels in which deteriorating technical efficiency co-existed with a decline in technological change. In the final group we find the two remaining hotels (u_4 and w_2). These two hotels had the lowest TFP score and were also the most inefficient in the sample. However, to improve they would have to upgrade the organisational factors related to a balanced use of inputs versus outputs and/or acquire new technologies.

Before we conclude, we should point out several problems with the use of data envelopment analysis (DEA). DEA does not identify the factors which give rise to inefficiency, but calls attention to those units in which inefficiency exists. Moreover, it operationalises Farrell's concept of a relative efficiency measure based on observed inputs and outputs of units which

define the efficiency frontier. These frontier units envelope and identify less efficient units and provide a reference for the measurement of their relative efficiency. In an extreme situation, for instance, all units in the sample could be inefficient (Bessent & Bessent, 1980; Reynolds, 2003). In our case though, this is hard to believe since the results were mixed and, on the other hand, the annual reports of certain hotels show increasing profitability and augmented relations between inputs and outputs, costs and revenues etc. (Annual Report 2007 [Grand Hotel Union group], 2008; Annual Report 2007 [Hotel Lev], 2008).

However, after classifying the hotels in the sample in one of four groups, determined by all four possible combinations among technological change and total factor productivity change, the results are promising for the Slovenian hospitality industry. While several hotels proved to be inefficient, the majority improved their efficiency in the 2005-2007 period. Further, every hotel group improved in the said period, which shows progress in the Slovenian hospitality industry and allows positive expectations for the future. In spite of that, there is still room for adjustments. In time, the best-practice frontier switches. Hotels that were less efficient will have to try harder to find a perfect balance between their inputs and outputs to catch up to hotels that proved to be more efficient. Units will have to innovate and invest in technology in order to stay competitive in the global tourism market. In addition, units that proved to be efficient will have to remain in touch with changes over time and adjust their operations so as to maximise the efficiencies.

CONCLUSION

The Slovenian hospitality industry is in a subordinate market position relative to other sectors in the Slovenian economy and compared with well-known international hotel chains. In spite of its privileged growth of income and physical indicators, the Slovenian hospitality industry is still under-performing. Changes are needed and inevitable. The main problem lies in costs which have to be lowered. There are also some environmental factors which makes the industry more rigid.

However, this research yields some promising results. We assessed the performance of five hotel groups (encompassing 21 Slovenian hotels) in the 2005-2007 period. For this purpose, we employed an advanced linear programming procedure known as data envelopment analysis. The analysis is based on a Malmquist productivity index which allowed us to break down total factor productivity (TFP) into technical efficiency change and technological change. Further, a technical efficiency change was decomposed into pure technical efficiency change and scale efficiency change. We report results that indicate the Slovenian hotel industry is enhancing its efficiency since 14 hotels improved in the monitored period. In addition, the mean TFP score was 1.034.

Moreover, splitting total factor productivity into technical efficiency and technological change revealed there are many more hotels that proved to be technically rather than technologically efficient. There are 17 hotels which improved their technical efficiency and only 10 that enhanced their technological efficiency.

To conclude, competition stimulates growth and innovation. In such a competitive market setting hotel groups should prosper rather than just survive. Decision-making units are obliged to implement new methods, techniques or practices to increase or add value to their products and services. This research, however, serves as a guide and encouragement for Slovenian hotel management to further investigate their units to ultimately enhance their hotels' efficiency and performance.

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Appendices

Appendix 1: Povzetek

UVOD

Na globalnih trgih se med podjetji odvija oster boj za tržne deleže in obstoj nasploh. Managerji vseskozi iščejo nove poti, tehnike in metode, da bi svojim produktom (izdelkom in storitvam) dodali vrednost ter s tem pridobili nove oz. zadržali zveste potrošnike. Pri tem jih žene sla po dobičku, ki bi podjetju zagotovil obstoj oz. rast, njim pa delovno mesto. Vsaj v teoriji, je dosti načinov kako maksimizirati le-tega, toda v praksi se marsikatera metoda izkaže za neuresničljivo. Enostavno in ugodno rešitev, ki ne zahteva korenitih sprememb v poslovnih procesih predstavlja metoda povečanja učinkovitosti. Namreč, kadar podjetje poveča učinkovitost, poveča koristi in dobiček ob sočasnem zmanjšanju stroškov. Kljub temu, da je v večini sektorjev (trgov) moč zaslediti značilnosti popolne konkurence, so Anderson in soavtorji (2000) dokazali, da za hotelirski sektor le-to ne velja. Hotelirstvo namreč, ima značilnosti oligopolne konkurence. Majhno število ponudnikov hotelskih storitev in dokaj veliko povpraševanje po le-teh omogoča, da si managerji lahko privoščijo poslovati neučinkovito.

Managerji morajo v proces povečevanja učinkovitosti vključiti veliko mero previdnosti, saj bi lahko z ostrim posegom v poslovanje podjetja zmanjšali kakovost končnega izdelka ali storitve. Na primer, če bi hotelsko podjetje želelo povečati učinkovitost s prekomernim zmanjšanjem števila zaposlenih (s tem bi se število vložkov glede na izložke v poslovnem procesu zmanjšalo), bi sicer povečali produktivnost, vendar bi se pri tem lahko zmanjšala kakovost končne storitve. Posledično bi se zmanjšalo zadovoljstvo gostov, kar bi se odrazilo na prihodkih podjetja. Managerji morajo zato najti popolno razmerje med vložki in izložki, določitev le-tega pa je izredno dolg in edinstven postopek.

Cilj diplomske naloge je oceniti učinkovitost 5 slovenskih hotelskih verig in 21 hotelov v obdobju 2005-2007. V ta namen smo izračunali TFP (total productivity change) indeks, ki smo ga razstavili na spremembo v tehnološki (TECH) in tehnični (ECH) učinkovitosti. Hotele smo nato glede na doseženo učinkovitost med seboj primerjali in podali predloge za izboljšanje, če so se v proučevanem obdobju pokazali za neučinkovite.

Namen diplomske naloge je preučiti stopnjo učinkovitosti v slovenskem hotelirstvu in vzpodbuditi managerje podjetij k povečanju le-te.

Diplomo smo razdelili na štiri zaokrožene dele. Vsak del smo glede na vsebino razdelili na dve poglavji. V prvi del smo tako uvrstili kratko zgodovino razvoja slovenskega turizma s pomembnimi mejniki in bolj natančno predstavitev rezultatov slovenskega turizma v letu 2006. V drugem poglavju smo podrobneje proučili razmere v slovenskem hotelirstvu.

Sledi del, ki je po vsebini bolj teoretične narave. V prvem poglavju tega dela smo namreč predstavili pregled del, katera proučujejo učinkovitost različnih hotelirstev po svetu s pomočjo DEA (Data Envelopment Analysis) metode. V drugem poglavju pa smo podrobneje predstavili metodologijo dela.

V tretjem delu smo obravnavali temeljne spremenljivke, ki smo jih vključili, da bi lahko izračunali učinkovitosti hotelov. V prvem poglavju tega dela smo obravnavali vzorec podjetij, ki sodelujejo v raziskavi in le-te na kratko predstavili. V drugem poglavju pa smo pripravili pregled vložkov in izložkov uporabljenih v nalogi ter proučili njihova razmerja s pomočjo korelacijske analize.

V zadnjem delu so podani rezultati študije, katerim sledi razlaga temeljnih ugotovitev in zaključek.

TURIZEM IN HOTELIRSTVO V SLOVENIJI

Slovenija je majhna centralno-evropska država z nekaj več kot 2 milijoni prebivalcev. Slovensko gospodarstvo so zaznamovali naslednji pomembnejši mejniki: leta 1991 se je Slovenija odcepila od bivše socialistične Republike Jugoslavije in postala neodvisna država; v letu 2004 je postala polnopravna članica Evropske Unije; leta 2007 je prevzela Evro kot valuto Evropske Unije. V 15 letih neodvisnosti je Slovenija v gospodarskem smislu izredno napredovala. BDP je v tem obdobju rasel med 3 in 5 odstotki letno (Kračun, 2006). Vojna za neodvisnost je močno prizadela turizem v Sloveniji. Število obiskovalcev se je namreč izrazito zmanjšalo. Število prihodov turistov se je ponovno izenačilo s tistim v letu 1989 šele leta 2000. Toda vojna ni bila edini razlog za krizo v slovenskem turizmu. Razloge lahko najdemo tudi v premajhni prepoznavnosti blagovne znamke, ne dovolj razvitemu slovenskemu turističnemu produktu, šibki organiziranosti slovenskega turizma ter pod-povprečnemu poslovanju slovenskih turističnih podjetij.

Leta 2006 je bilo v Sloveniji na razpolago 81000 postelj, ki so dala možnost prenočitve 2,5 milijonom turistov (4% rast v primerjavi z predhodnim letom). Le-ti so skupno prestali 7,7 milijonov noči. Za Slovenski turizem je značilna izrazita sezonska komponenta, saj se največje število nočitev ustvari v poletnih mesecih (SURS, 2008).

V Sloveniji je okrog 26,682 hotelskih postelj, 130 hotelov in manj kot 100 hotelskih podjetij. Več kot polovico hotelov (55%) je moč najti v obalnih in gorskih destinacijah. Slovensko hotelirstvo je kljub privilegirani rasti prihodkov in fizičnih indikatorjev neuspešno. Vrsta kazalnikov uspešnosti poslovanja (EBIT, ROA, ROE , čista dobičkonosnost prihodkov, delež dobička v prihodkih) in finančnih kazalnikov je bila v obdobju 2000-2004 negativnih. Slovenska hotelska podjetja se tako uvrščajo na eno izmed zadnjih mest v primerjavi z drugimi evropskimi hotelskimi podjetji (Kavčič, 2005).

PREGLED TEORIJE

Literatura, ki govori o upravljanju v hotelirstvu je bogata s poizkusi izračunavanja učinkovitosti in učinka v hotelski industriji. Pred uvedbo DEA modela se je večina raziskovalcev posluževala računanja učinkovitosti z uporabo klasične analize razmerij in/ali z izračunavanjem indeksov. V zadnjih 40 letih pa so v ospredje prišle predvsem metode, ki so se posluževale računanja mejne učinkovitosti. Metoda, ki je dandanes vodilna in najbolj splošno uporabljena je metoda DEA (Data Envelopment Analysis).

DEA uporablja sistem linearnega programiranja, s katerim glede na vzorec podatkov oblikuje linijo učinkovitosti. Enote v vzorcu se nahajajo na ali pod to linijo. Enote na liniji so 100% učinkovite, tiste pod njo (ki jih linija »obdaja«) pa imajo še neizkoriščene zmogljivosti in lahko temu primerno učinkovitost še povečajo. Za vsako enoto posebej DEA optimizira izložke glede na vložke, ki so skrbno izbrani in nadzorovani, kar ji omogoča ocenitev produktivnosti obravnavane enote. Obstajajo tri temeljne DEA metode: CRS, VRS in Malmquistov indeks produktivnosti. V namene te diplomske naloge smo priskrbeli podatke o posameznih hotelih za triletno obdobje (2005-2007). Le-to nam je omogočilo izbiro posebne DEA metode, ki upošteva spremembe v času in se imenuje Malmquistov indeks produktivnosti (TFP - total productivity change). Ta metoda izpelje stopnjo učinkovitosti določenega leta glede na temu prejšnje leto. Pri tem upošteva spremembe v tehnologiji (TECH), ki linijo mejne učinkovitosti pomaknejo navzgor; ter spremembe v tehnični učinkovitosti (ECH), pri kateri se podjetja zaradi povečane učinkovitosti približajo liniji mejne učinkovitosti. Spremembo v tehnični učinkovitosti lahko dalje razgradimo na spremembo v učinkovitosti ekonomije obsega (SEC – scale efficiency change) in na spremembo v čisti tehnični učinkovitosti (PTC – pure technical efficiency change). Malmquistov indeks produktivnosti (TFP) je končno produkt med spremembo v tehnologiji (TECH) in spremembo v tehnični učinkovitosti (ECH).

Pri tolmačenju DEA rezultatov moramo kljub vsemu biti previdni. DEA nam ne posreduje vzrokov zaradi katerih je določena enota neučinkovita, pač pa izpostavi enote v katerih neučinkovitost obstaja. Glede na opazovane vložke in izložke DEA izračuna relativne učinkovitosti in začrta linijo mejne učinkovitosti. Linija mejne učinkovitosti obda neučinkovite enote. V skrajnem primeru bi lahko vsi hoteli v vzorcu poslovali neučinkovito (Bessent and Bessent, 1980; Reynolds, 2003).

V hotelirstvu managerji težko vplivajo na vložke, saj sprememba le-teh običajno zahteva velike investicije in korenite spremembe v poslovanju podjetja. Od managerjev se zahteva, da ob danih kapacitetah le-te zapolnijo do skrajne meje in temu primerno povečajo prihodke ter dobiček podjetja. Naši izračuni učinkovitosti so tako posledica usmerjenosti na izložke, katerih sprememba je lahko posledica že manjšega dejanja managerjev (oglaševanje, ugodnosti…).

VZOREC PODATKOV IN UPOŠTEVANE SPREMENLJIVKE

V diplomski nalogi smo z Malmquistovim indeksom produktivnosti merili spremembo v učinkovitosti v obdobju 2005-2007 v 21 slovenskih hotelih. Hoteli so s pomočjo izbranih spremenljivk razvrščeni glede na hotelsko podjetje kateremu pripadajo. Seznam hotelskih podjetij s pripadajočimi spremenljivkami je predstavljen v Tabeli 1.

Tabela 1: hotelske verige in hoteli

Hotelska veriga	**Hoteli**
Grand Hotel Union (y)	Hotel Union**** in Hotel Lev*****
Lifeclass Hotels & Spa (w)	Grand Hotel Portorož*****, Hotel Slovenija****, Hotel Riviera****, Hotel Mirna****, Hotel Apollo**** in Hotel Neptun****
Sava Hoteli Bled (u)	Grand Hotel Toplice*****, Hotel Villa Bled****, Golf Hotel****, Park Hotel****, Garni Hotel Jadran*** in Trst hotel***
Hoteli Metropol (v)	Grand Hotel Metropol*****, Hotel Roža****, Hotel Barbara*** in Hotel Lucija***
Hoteli Bernardin (x)	Grand Hotel Bernardin*****, Hotel Histrion**** in Hotel Vile Park***

Vir: lasten vir

Gostje hotelskih podjetij so vedno bolj zahtevni. Zadovoljitev osnovnih hotelskih potreb po počitku in hrani ter pijači (Mihalič, 1997) jim namreč ne zadošča več. Hotelska podjetja se trudijo, da bi v svojo ponudbo zajeli čim večjo mero kvalitetnih storitev (wellness & spa, kongresne dvorane, trgovine, razne prireditve, zabavo, itd.), s katerimi bi navdušili oz. vsaj zadovoljili zahtevnega gosta. Pri tem je temeljni proces posameznega podjetja še vedno pretvorba vložkov v izložke. Izložki so namreč stvarno merilo, ki kaže ali je podjetje doseglo oz. preseglo zadane cilje (Yang, Lu; 2006). V delu smo se osredotočili na naslednje vložke ter izložke posameznega hotela:

- Vložki: celotni stroški poslovanja, število zaposlenih iz opravljenih ur, število sob in kapaciteta oddelka hrane & pijač (število sedežev). Za spremembo slednjih dveh vložkov so potrebne velike investicije in reorganizacija v podjetju. Tako se ta dva vložka v večini hotelov v obravnavanem obdobje ne spreminjata.
- Izložki: Skupni prihodki pridobljeni iz različnih oddelkov (prihodki iz nastanitve, hrane & pijač, kongresov, wellness dejavnosti, drugi prihodki) in število gostov na letni ravni.

Razmerja med vložki in izložki smo nato preverili s korelacijsko analizo in ugotovili naslednje pozitivne korelacije:

- Vsi vložki so pozitivno in močno povezani z izložki (pri tem je bila najmočnejša korelacija med celotnimi stroški poslovanja in skupnimi prihodki pridobljeni iz različnih oddelkov).
- Vsi vložki so med seboj pozitivno povezani
- Izložka sta prav tako pozitivno in močno povezana.

REZULTATI TER RAZLAGA TEMELJNIH UGOTOVITEV

Učinkovitost poslovanja slovenskih hotelov smo izmerili s posebno DEA metodo, ki upošteva spremembe v času in rezultat izračuna poda Malmquistov TFP indeks. TFP indeks lahko razstavimo na naslednje učinkovitosti:

- Sprememba v tehnologiji: sprememba v tehnologiji je posledica inovacij. Hotelska podjetja lahko na indeks spremembe v tehnologiji vplivajo z investiranjem v nove postopke, tehnike in metode ali v strokovno znanje povezano z le-temi.
- Sprememba v tehnični učinkovitosti: sprememba v tehnični učinkovitost se nanaša na vprašanje, kako učinkovito managerji zaposlujejo vložke in jih pretvarjajo v izložke. Povečamo jo lahko s preudarnejšim načrtovanjem poslovnih procesov, izboljšanjem tehnične strokovnosti, kakovostnejšim vodenjem in kakovostnejšo organizacijo dela v hotelskem podjetju. Spremembo v tehnični učinkovitosti lahko dalje razstavimo na spremembo v učinkovitosti ekonomije obsega in na spremembo v čisti tehnični učinkovitosti.

Iz rezultatov je razviden napredek v učinkovitosti za vse hotelske verige v obdobju 2005-2007. Namreč, vse verige so zabeležile TFP indeks (produkt med TECH in ECH) večji kot 1. Pri tem so vse hotelske verige napredovale v tehnološki učinkovitosti, medtem ko so tri (Grand Hotel Union, Sava Hoteli Bled, Hoteli Metropol) napredovale v tehnološki učinkovitosti. Največjo TFP spremembo v vzorcu je bilo moč opaziti v primeru hotelskega podjetja Grand Hotel Union. Slednje je zabeležilo TFP spremembo 1,132, ki je bila posledica predvsem velikega napredka v tehnologiji. Poglavitne razloge za vodilen položaj v vzorcu lahko iščemo v preseženih letnih načrtih za leto 2006 in 2007 ter v močnem zmanjšanju števila zaposlenih ob sočasnem povečanju prihodkov v hotelu Lev (Letna poročila hotelov Grand Hotel Union in Hotela Lev, 2006, 2007). Lifeclass Hotels & Spa pa je bila veriga hotelov, ki je najbolj napredovala v tehnični učinkovitosti.

V vzorcu je bilo 14 od 21 takšnih hotelov, ki so v obdobju 2005-2007 napredovali. Prav tako je v vseh nadzorovanih spremenljivkah (TECH, ECH, PTC, SEC) napredoval povprečen slovenski hotel in zabeležil TFP indeks 1,034. Hotele smo nato razvrstili glede na napredek (nazadovanje) v tehnični oz. tehnološki učinkovitosti. Izid le-tega predstavljajo na novo nastale 4 skupine. V zavidanja vredno prvo skupino smo razvrstili hotele (8 hotelov), ki so napredovali tako v tehnični učinkovitosti, kot tudi v tehnologiji. V najobsežnejši drugi in tretji

skupini so hoteli, ki so napredovali le v eni izmed učinkovitosti. V zadnjo skupino pa so uvrščeni hoteli, ki so v obeh učinkovitostih nazadovali.

SKLEP

Pretekle raziskave so pokazale, da slovensko hotelirstvo posluje neuspešno (Kavčič, 2005; Knežević Cvelbar & Mihalič, 2007; Tajnikar & Pušnik, 2008). Kljub temu rezultati tega diplomskega dela kažejo na svetlejšo prihodnost slovenskega hotelirstva. V zadnjih nekaj letih so slovenske hotelske verige močno napredovale v učinkovitosti. Zadovoljive rezultate kažejo tudi sodobna letna poročila hotelskih podjetij in razne analize, ki jih le-te vršijo. Prihodki in tudi dobiček so iz leta v leto višji. Seveda obstajajo tudi hoteli, ki zaostajajo za tistimi najuspešnejšimi. Konkurenca in globalni trg hotelskih storitev jih bodo slej ko prej prisilili, da bodo morali vstopiti v korak s časom in povečati uspešnost poslovanja.

Results from DEAP Version 2.1

Instruction file = eg4-ins.txt
Data file = eg4-dta.txt

Output-oriented Malmquist DEA

DISTANCES SUMMARY

year = 1

firm no.	crs te rel to tech in yr t-1	crs te rel to tech in yr t	crs te rel to tech in yr t+1	vrs te
1	0.000	1.000	1.038	1.000
2	0.000	0.749	0.706	0.756
3	0.000	1.000	0.897	1.000
4	0.000	1.000	1.161	1.000
5	0.000	1.000	1.020	1.000
6	0.000	1.000	0.902	1.000
7	0.000	0.945	0.837	0.963
8	0.000	1.000	1.067	1.000
9	0.000	1.000	1.034	1.000
10	0.000	0.788	0.804	0.804
11	0.000	0.845	0.621	0.859
12	0.000	1.000	1.056	1.000
13	0.000	0.852	0.879	0.861
14	0.000	0.842	0.869	0.855
15	0.000	0.798	0.578	0.799
16	0.000	1.000	1.039	1.000
17	0.000	0.933	0.877	0.998
18	0.000	0.983	1.003	1.000
19	0.000	0.987	0.983	1.000
20	0.000	1.000	0.885	1.000
21	0.000	0.997	0.863	1.000
mean	0.000	0.939	0.910	0.947

year = 2

firm no.	crs te rel to tech in yr t-1	crs te rel to tech in yr t	crs te rel to tech in yr t+1	vrs te
1	1.021	1.000	1.076	1.000
2	0.754	0.732	0.780	0.740
3	1.125	1.000	0.929	1.000
4	0.963	1.000	0.981	1.000
5	1.212	1.000	1.253	1.000
6	4.434	1.000	4.300	1.000
7	0.998	0.888	0.854	0.905
8	1.075	1.000	1.043	1.000
9	1.005	1.000	1.132	1.000
10	0.842	0.868	0.855	0.868
11	0.901	0.701	0.909	0.878
12	1.002	1.000	1.068	1.000
13	0.837	0.827	0.875	0.831
14	0.823	0.839	0.879	0.843
15	0.803	0.592	0.768	0.728
16	1.015	1.000	1.091	1.000
17	1.016	0.977	1.014	1.000
18	0.979	1.000	1.050	1.000
19	0.929	0.929	0.939	1.000
20	1.178	1.000	1.034	1.000
21	1.157	1.000	0.874	1.000
mean	1.146	0.922	1.129	0.942

year = 3

firm no.	crs te rel to tech in yr ********** t-1	t	t+1	vrs te
1	1.017	1.000	0.000	1.000
2	0.822	0.891	0.000	0.892
3	1.132	1.000	0.000	1.000
4	0.897	0.854	0.000	0.907
5	1.675	1.000	0.000	1.000
6	1.119	1.000	0.000	1.000
7	0.849	0.817	0.000	0.819
8	1.030	1.000	0.000	1.000
9	0.917	1.000	0.000	1.000
10	0.983	0.984	0.000	0.991
11	0.909	1.000	0.000	1.000
12	0.760	0.948	0.000	0.983
13	0.950	1.000	0.000	1.000
14	0.970	1.000	0.000	1.000
15	0.741	0.797	0.000	0.797
16	0.908	1.000	0.000	1.000
17	0.961	1.000	0.000	1.000
18	0.966	1.000	0.000	1.000
19	1.034	1.000	0.000	1.000
20	1.108	1.000	0.000	1.000
21	1.225	1.000	0.000	1.000
mean	0.999	0.966	0.000	0.971

[Note that t-1 in year 1 and t+1 in the final year are not defined]

MALMQUIST INDEX SUMMARY

year = 2

firm	effch	techch	pech	sech	tfpch
1	1.000	0.991	1.000	1.000	0.991
2	0.977	1.045	0.978	0.999	1.021
3	1.000	1.120	1.000	1.000	1.120
4	1.000	0.911	1.000	1.000	0.911
5	1.000	1.090	1.000	1.000	1.090
6	1.000	2.217	1.000	1.000	2.217
7	0.939	1.127	0.940	1.000	1.058
8	1.000	1.004	1.000	1.000	1.004
9	1.000	0.985	1.000	1.000	0.985
10	1.102	0.975	1.079	1.021	1.074
11	0.829	1.323	1.023	0.811	1.098
12	1.000	0.974	1.000	1.000	0.974
13	0.972	0.990	0.966	1.006	0.962
14	0.996	0.975	0.986	1.010	0.971
15	0.741	1.369	0.911	0.813	1.015
16	1.000	0.988	1.000	1.000	0.988
17	1.048	1.052	1.002	1.046	1.102
18	1.017	0.980	1.000	1.017	0.996
19	0.940	1.002	1.000	0.940	0.942
20	1.000	1.154	1.000	1.000	1.154
21	1.003	1.156	1.000	1.003	1.159
mean	0.976	1.093	0.994	0.982	1.067

year = 3

firm	effch	techch	pech	sech	tfpch
1	1.000	0.972	1.000	1.000	0.972
2	1.218	0.931	1.206	1.009	1.133
3	1.000	1.104	1.000	1.000	1.104
4	0.854	1.035	0.907	0.941	0.883
5	1.000	1.156	1.000	1.000	1.156
6	1.000	0.510	1.000	1.000	0.510
7	0.920	1.039	0.905	1.016	0.956
8	1.000	0.994	1.000	1.000	0.994
9	1.000	0.900	1.000	1.000	0.900
10	1.134	1.007	1.141	0.993	1.142
11	1.426	0.838	1.139	1.252	1.195
12	0.948	0.866	0.983	0.965	0.822
13	1.209	0.948	1.203	1.005	1.145
14	1.192	0.962	1.187	1.005	1.147
15	1.347	0.847	1.095	1.230	1.140
16	1.000	0.913	1.000	1.000	0.913
17	1.023	0.963	1.000	1.023	0.985
18	1.000	0.959	1.000	1.000	0.959
19	1.077	1.011	1.000	1.077	1.089
20	1.000	1.035	1.000	1.000	1.035
21	1.000	1.184	1.000	1.000	1.184
mean	1.056	0.949	1.033	1.022	1.002

MALMQUIST INDEX SUMMARY OF ANNUAL MEANS

year	effch	techch	pech	sech	tfpch
2	0.976	1.093	0.994	0.982	1.067
3	1.056	0.949	1.033	1.022	1.002
mean	1.015	1.018	1.013	1.002	1.034

MALMQUIST INDEX SUMMARY OF FIRM MEANS

firm	effch	techch	pech	sech	tfpch
1	1.000	0.982	1.000	1.000	0.982
2	1.091	0.986	1.086	1.004	1.076
3	1.000	1.112	1.000	1.000	1.112
4	0.924	0.971	0.952	0.970	0.897
5	1.000	1.123	1.000	1.000	1.123
6	1.000	1.063	1.000	1.000	1.063
7	0.930	1.082	0.922	1.008	1.006
8	1.000	0.999	1.000	1.000	0.999
9	1.000	0.942	1.000	1.000	0.942
10	1.118	0.991	1.110	1.007	1.107
11	1.088	1.053	1.079	1.008	1.145
12	0.974	0.919	0.991	0.982	0.895
13	1.084	0.969	1.078	1.005	1.050
14	1.090	0.968	1.082	1.007	1.055
15	0.999	1.077	0.999	1.000	1.076
16	1.000	0.950	1.000	1.000	0.950
17	1.035	1.006	1.001	1.034	1.042
18	1.008	0.969	1.000	1.008	0.977
19	1.006	1.007	1.000	1.006	1.013
20	1.000	1.093	1.000	1.000	1.093
21	1.001	1.170	1.000	1.001	1.171
mean	1.015	1.018	1.013	1.002	1.034

[Note that all Malmquist index averages are geometric means]

Appendix 3: Correlation analysis performed with the SPSS computer programme

Correlation is significant at the 0.01 level (2-tailed).

		Total operating expenses	Number of employees	Number of guest rooms	Total capacity of the catering division	Total revenues generated by various hotel services	Number of guests
Total operating expenses	Pearson Correlation	1	.977(**)	.781(**)	.586(**)	.982(**)	.866(**)
	Sig. (2-tailed)		.000	.000	.005	.000	.000
	N	21	21	21	21	21	21
Number of employees	Pearson Correlation	.977(**)	1	.764(**)	.558(**)	.969(**)	.881(**)
	Sig. (2-tailed)	.000		.000	.009	.000	.000
	N	21	21	21	21	21	21
Number of guest rooms	Pearson Correlation	.781(**)	.764(**)	1	.673(**)	.853(**)	.798(**)
	Sig. (2-tailed)	.000	.000		.001	.000	.000
	N	21	21	21	21	21	21
Total capacity of the catering division	Pearson Correlation	.586(**)	.558(**)	.673(**)	1	.614(**)	.294
	Sig. (2-tailed)	.005	.009	.001		.003	.195
	N	21	21	21	21	21	21
Total revenues generated by various hotel services	Pearson Correlation	.982(**)	.969(**)	.853(**)	.614(**)	1	.892(**)
	Sig. (2-tailed)	.000	.000	.000	.003		.000
	N	21	21	21	21	21	21
Number of guests	Pearson Correlation	.866(**)	.881(**)	.798(**)	.294	.892(**)	1
	Sig. (2-tailed)	.000	.000	.000	.195	.000	
	N	21	21	21	21	21	21

Source: Own calculations using the SPSS computer programme.