The Efficiency of Tourism Industry Based on Data Envelopment Analysis between the Middle East and East Asian Countries

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ABSTRACT

This study measures and compares the efficiency of two groups of countries including the Middle East countries (Iran, Turkey, Israel, the UAE and Saudi Arabia) and East Asian countries (Indonesia, India, Malaysia, Singapore, Thailand and China) in tourism industry. Data envelopment analysis (DEA) model were used for estimation in 2013. For the analysis, we take the following inputs into consideration: investments, the number of employees and the number of hotels. As regards the outputs, we choose the number of tourists and revenue. According to the research features, we adopt DEA models, Banker, Charnes, and Cooper (BCC), super-efficiency, slacks-based measure (SBM) and the most productive scale size (MPSS), to analyze the relative efficiency. Finally, we provide a comparison between the performance of Iran and other countries and some suggestions. The results showed that in envelopment BCC model, India and Indonesia are inefficient because of insufficient number of international tourists compared to the number of employees, and, the United Arab Emirates and Saudi Arabia are inefficient because of insufficient revenue from tourism compared to the investments in this sector. The SBM model showed that India, Indonesia, Iran, China, the United Arab Emirates and Saudi Arabia are inefficient due to surplus in three inputs to tourism industry compared to the outputs. The super-efficiency model showed the highest performance in Turkey, Thailand and Singapore, and, MPSS model showed the maximum efficiency in Malaysia, Singapore and Thailand in East Asia and Turkey, Egypt and Israel in the Middle East countries, in comparison with other countries.

Keywords: Tourism, Envelopment Model, Super-efficiency, Slacks-based Measures, the most productive sale size, East Asia and Middle East.

1. INTRODUCTION

The measurement of efficiency and productivity in the tourism industry has been the subject of a considerable amount of research in recent years, reflecting both the growing economic importance of tourism as a source of international revenue and domestic employment, and increasing competition in the global tourist markets around the world (Hadad et. al., 2012).

Tourism industry is one of the most important income-generating industries in the world. Tourism and its related activities have been developed considerably during the last decades. Indeed, it can be said that tourism is a gainful and advantageous industry which should be considered by tourism planners and marketers (Hakaki et. al., 2015). Tourism has become one of the most significant export sectors in many developing countries. A general consensus has emerged that it not only increases foreign exchange income, but also creates employment opportunities, stimulates the growth of the tourism industry and by virtue of this, triggers overall economic growth. As such, tourism development has become an important target for most governments, especially for developing countries (Jafari Samimi et. al., 2011). And, increase the quality and quantity in this field, need to increase productivity and efficiency in the field of program implemented in this countries.

Increasing the efficiency is one of the economic concepts always has been considered by politicians and economists in order to raise living standards, prosperity, peace and human comfort. So that, all schools and economic societies emphasized to efficiency and appropriate policy advice is provided in order to increase in various factors, (Mahmodi and Ghasemi, 2010).

It is necessary to take steps in order to attract international tourists, to provide more economic growth, according to the important role of tourism industry to earn money and reducing dependence on exports of raw materials including oil, also, long history and cultural, historical and natural attractions of Asian countries. Rich countries in the region have invested widely in tourism sector to change their economy and exports according to the World Bank statement such as: Saudi Arabia and the UAE as well as East Asian countries such as Malaysia.

Iran, as one of the Asian countries, can achieve great spiritual and material profits with proper management of these resources with variety climates, environment and seasons, monuments, recreation areas and natural beauty (Mohseni, 2009). Iran is among the 9 countries of the world in terms of buildings and monuments, and the top 10 countries in terms of ecotourism attractions (Armaghan, 2007). Of course, planning and investments is needed in order to compete with other countries in attracting tourists. In this context, increasing the efficiency in this area is essential, which led to increasing efficient programs and make faster achieving the objects. Comparisons between different countries can help planners in terms of efficiency in tourism sector.

In this research, comparing between two groups of countries is considered in terms of their performance in tourism industry: the first Middle Eastern, and the second East Asian countries. Data envelopment analysis is used for the analysis. In this method, all information is used, so, it is called envelopment (Emami Meybodi, 2000). For this purpose, the latest available data is used in the field of tourism in these countries in2013. As regards the inputs, we choose Investment, number of employees and the number of hotels as well as the outputs including the number of tourists and revenue. Evaluation of performance between two groups of countries in the field of tourism is the main purpose of the research.

2. RELATED WORK

There are several studies in the literature that provides recent and updated reviews on the performance studies in the tourism industry. Khaksar Astane et. al., (2015) estimated the efficiency of the hotel industry in provinces of Iran by super efficiency model. Based on the results, the hotel operations had efficiently operate in six provinces with the efficiencies of under the constant returns to scale, 12 provinces have the terms of technical performance variable returns to scale and In 6 on the performance scale. The average of technical efficiency in the case of constant returns to scale is 0.75 and in the increasing returns to scale is 0.99. It means that, on average, 66.55 percent of the province should save in their inputs of the hotel's activities to achieve technical efficiency and they should 69.51 percent save in their inputs of hotel activities to achieve to the technical and scale efficiency. Talebi Najaf Abadi et. al., (2013) evaluated the information technology influence on the efficiency of the accounting information systems. The statistical population of this research includes all the Iranian hotels, in which 37 three-star, four-star and five-star ones are located in Tehran. The average comparison of test (*t*-test) and correlation Solidarity tests were applied to test the theories. The results of this study revealed that the hotels utilize effective and high-tech accounting information systems and applying advanced technologies increases the efficiency of the accounting information systems. This work combines several analytical techniques, including data envelopment analysis (DEA) models and the canonical analysis model, in order to shed new light on the relative efficiency of international tourism development. As regards the outputs, the number of international tourists, sales for international travel agencies, and foreign exchange earnings from travel were chosen. In the first stage, the canonical analysis model is used to investigate the correlations of related variables. In the second stage, DEA models, including Charnes, Cooper, and Rhodes (CCR), Banker, Charnes, and Cooper (BCC) and slacks-based measure (SBM), were adopted to analyze the relative efficiency of international tourism development. Finally, some management suggestions provided for the development of international tourism industry in emerging China Kao et. al., (2011). Aissa and Goaied (2016),used financial data derived from 27 hotel companies operating in Tunisia. Based on the results, display Hotel size, level of indebtedness, exposure to crisis events and levels of managers' education are influential. Corne (2015), benchmarking the effects of tourism in France by DEA model. The result show that, there is potential to improve efficiency in tourism sector in France, and, budgets and hotel groups are more efficient than others. Sorzabal et. al., (2015) examine the efficiency of Tourism Destination Website Based on Data Envelopment Analysis and introduced variables that improve communication channels. Goncalves (2013),analysed French ski resorts productivity with the Luenberger productivity indicator (LPI) based on the directional distance function. Results do not establish a clear relationship between the ski resorts' size and productivity. Therefore, the Kruskal–Wallis test is used to statistically verify this relationship. Managerial implications are derived from this study. Oliveira et. al., (2013) benchmarking the efficiency and its determinants in Portuguese hotels in the Algarve. The results showed that the number of hotels' stars is an important factor for the performance. Köksal and Aksu (2007),analyzed the efficiency of A-group travel agencies evaluated with data envelopment analysis (DEA) in the Antalya region in Turkey. The results showed that there is no operating efficiency difference between the travel agency groups. However, travel agencies and managers who scored low mean efficiency ratings were advised how to improve their rating.

3. METHODOLOGY

The study is applied research based on the purpose and is descriptive-analytic based on the method of data collection. Data collection tools are Internet and library documents. The documents related to official

sources, specially the World Bank, which used to collect data. In this study, BCC model was used in the form of input-oriented ,according to the specific research topic.

Data Envelopment Analysis (DEA) is a non-parametric approach of frontier estimation, first developed by Charnes, Cooper, and Rhodes (CCR). Based on the original CCR model, Banker, Charnes, and Cooper (BCC) developed a variable returns to scale (VRS) variation. Various researchers have developed DEA ever since. A large number of empirical studies have adapted these models to deal with real economic problems. One adaptation is to rank decision-making units (DMUs), such as firms or industries. DMUs are divided into efficient and inefficient groups, and their ranks can be examined by using DEA. The most efficient unit is the one that can proportionally reduce outputs relative to the most efficient one without becoming inefficient (Khac Minh et. al., 2012).

Efficiency in a DEA (CCR model) is called technical and scale efficiency (TSE) and the relative efficiency of a DMU is defined as the ratio of its total weighted output to its total weighted input. DEA permits each DMU to select any desirable weight for each input and output, provided that they satisfy certain reasonable conditions. First, these weights cannot be negative and, second, the weights must be universal (Cooper et. al., 1999; Thanassoulis, 2001). The process should be repeated for each country so that each country receives its optimal weights. Then we can determine the most efficient countries (Hadad et. al., 2012).

For any special DMUs, the CCR model with constant return to scale can be formulated as follows to obtain a score of technical efficiency:

$$\text{Max} = \sum_{r=1}^{s} u_r y_{rp} + u_0$$

s.t.:
$$\sum_{i=1}^{m} v_r x_{ip} = 1$$

$$\sum_{i=1}^{m} u_r y_{rj} - \sum_{i=1}^{m} v_i x_{ij} + u_0 \leq 0 \quad j = 1, 2, ..., n$$

$$u_0 \geq 0$$

$$u_r, v_i \geq 0$$

Where X_{ij} the number of inputs and y_{rj} is the number of outputs. The BCC model, named after Banker, Charnes and Cooper (1984), was developed by relaxing the CCR model or the constant returns to scale assumption on the envelopment surface. We can achieve discrimination between departures due to pure technical inefficiency or to scale inefficiency.

In addition to using BCC method, some methods can used to complete the calculation, such as supper efficiency, SBM and MPSS models. The use of the super-efficiency model can contribute to provide the more detailed list of functional units. The Super efficiency name used to refer the DEA modified model which units can have efficiency values greater than one. The reason is that, the firms to evaluate the efficiency do not have any restriction for the placement itself as a reference ahead. This method is presented by Anderson and Peterson for the first time, its main purpose is to provide a system for ranking the firms that

can distinguish between firms on the frontier. The relationships of a super efficiency model to calculate the efficiency of decision making unit is as follows:

Min θ

Subject to

$$\sum_{j=1,\,j\neq 0}^{n} \lambda_j x_{ij} \leq \theta x_{ij} \quad i = 1, 2, ..., m$$

$$\sum_{j=1,\,j\neq 0}^{n} \lambda_j y_{ij} \leq y_{rj} \quad r = 1, 2, ..., t$$

$$\sum_{j=1}^{n} \lambda_j = 1$$

$$u_r, v_i \geq \varepsilon \; \forall \; r \text{ and } i$$

Moreover, Tone (2001) has proposed a slacks-based measure (SBM), which is non-radial and deals with input/output slacks directly. The SBM returns an efficiency measure between 0 and 1, and gives unity if and only if the DMU concerned is on the frontiers of the production possibility set without input/output slacks (Kao et. al., 2011). In order to estimate the efficiency of DMU (x_0, y_0), we formulate the following fractional program in λ, s^-, and s^+:

$$\text{Min } Z = \left(\frac{1}{s} \sum_{r=1}^{s} \theta_r - \varepsilon \sum_{r=1}^{s} s_r^- \right)$$

$$\text{Min } Z = \left(\frac{1}{m} \sum_{i=1}^{m} \theta_i - \varepsilon \sum_{i=1}^{m} s_r^- \right)$$

s.t:

$$\sum_{j=1}^{n} \lambda_j x_{ij} + s_r^+ = x_{i0} \quad i = 1, 2, ..., m$$

s.t:

$$\sum_{j=1}^{n} \lambda_j x_{ij} = \theta_i x_{i0} \quad r = 1, 2, ..., m$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} = \theta_r y_{r0} \quad r = 1, 2, ..., s$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} - s_r^+ = y_{r0} \quad r = 1, 2, ..., s$$

$$\theta_r \geq 1 \quad r = 1, 2, ..., s$$

$$\lambda_j \geq 0 \quad j = 1, 2, ..., n$$

$$\theta_r \geq 1 \quad r = 1, 2, ..., s$$

$$\lambda_j \geq 0 \quad j = 1, 2, ..., n$$

Output-oriented model of SBM

Input-oriented model of SBM

Which

$$\hat{x}_{io} = \theta_i^* x_{io}, \; \hat{y}_{ro} - y_{ro} = S_r^+$$

$$\hat{y}_{ro} = \theta_r^* y_{ro}, \; \hat{x}_{io} - x_{ro} = S_i^-$$

Finally, the concept of returns to scale is directly related to the estimation of the most productive scale size (MPSS). MPSS concept in DEA was first introduced in 1984 by Banker. So that, the decision-making unit is a MPSS if and only if reduce the inputs amount α and increase the size of outputs by as much β, and still production will be possible and $\beta \geq \alpha$. In other words, if decision making unit is efficient

by the BCC model, so, it would be efficient with constant efficiency in CCR model. The common area of CCR and BCC efficient frontier which is true in his property is MPSS. The MPSS for a given input and output mix is the scale size at which the outputs produced 'per unit' of the inputs is maximized. Thus, a production possibility $(X_j, Y_j) \in T$ represents a MPSS if and only if for all production possibilities $(\beta X_j, \alpha Y_j)$ $\in T$ we have $\alpha/\beta \leq 1$. The concept of MPSS is thus based on the comparison of average productivities. In order to maximize the average productivity, one would increase the scale size if increasing returns to scale were prevailing, and decrease the scale size if decreasing returns to scale were prevailing (Banker, 1984).

4. RESULTS

As mentioned, the main DEA models can classified to CCR and BCC models based on the type of envelopment BCC model. In this study, BCC model was chosen in the form of envelopment BCC model and input-oriented, according to preliminary surveys. Estimates are done by Gams software, and super efficiency, SBM and MPSS models were used.

The output of estimate the BCC model in envelopment BCC model and input-oriented in the following table shows which some counties are inefficiency including Indonesia, India, UAE and Saudi Arabia, so that, Indonesia has 74 percent of inefficiency and India, UAE and Saudi Arabia are inefficient respectively 80, 53 and 61 percent. The reason of inefficiency in Indonesia and India is because of the number of employees in tourism field in contrast the number of tourist arrivals to the countries. There were 8 million incoming international tourists in front of 3 million employees in Indonesia in 2013. The situation was worse in India and there were almost 22 employees in front of 7 million international tourists in 2013, which leads to inefficiency off the countries. It should be noted that the number of domestic tourists in India is too much, but, the number of international tourists is much less than the capacity of the country in attracting tourists. Therefore, the number of international tourists in comparison with the number of employees in the industry leads to lack of efficiency in this country. According to the explanations, in input 1(the number of employees) for Malaysia, there are 540 thousand input surplus. In other words, to achieve efficiency, 540 thousand people must be deduced from tourism services employees, and, the number of employees in India should be deduced about 3749 thousand people to close to the level of efficiency.

But, the surplusin the amount of investment (input 2) was the major cause of inefficiency in UAE and Saudi Arabia. Because, the UAE has 26696 million dollars surplus entry investment to tourism sector which could not use it efficiently, according to the following table. In addition, the country could not be efficient in attracting tourists and in the number of inbound tourists (output 2) has 1230 thousand people deficit (As the comparison, Egypt with very less amount of investment could absorb the same amount of tourist as the UAE, because of historical fields and potentials which despite lower investment, has attracted the same number of tourists). The UAE has 5140 million dollars deficit in tourism income (output 2). In other words, the country to achieve optimum performance level should increase its income about 5140 million dollars due to the amount of investment.

Also, Saudi Arabia has 47414 million dollars investment surplus and need to review its policies. (Saudi Arabia only earned 8 billion dollars revenues in front of 149 billion dollars investment in tourism,

which is low in comparison with other countries. The UAE had the same procedure with 11 billion dollars revenues in front of 77 billion dollars investment. But, Turkey with 10 billion investments could earn 34 billion dollars revenues from tourists). Saudi Arabia has 10578 million dollars deficit in tourism revenues in contrast to the high investment.

Table 12.1
Outputs for efficiency based on the envelopment BCC model and input-oriented

Location	Decision-making unit (country)	Efficiency (Z)	Surplus inputs			Outputs' deficit		Reference set
			Input 1	Input 2	Input 3	Output 1	Output 2	
East Asian countries	Indonesia	0.26	540	0	0	376	0	Malaysia, Egypt, Israel
	India	0.20	3749	0	0	13927	0	Malaysia, Singapore, Egypt
	Malaysia	1	0	0	0	0	0	Malaysia
	Singapore	1	0	0	0	0	0	Singapore
	Thailand	1	0	0	0	0	0	Thailand
	China	1	0	0	0	0	0	China
Middle-eastern countries	Iran	1	0	0	0	0	0	Iran
	Turkey	1	0	0	0	0	0	Turkey
	Egypt	1	0	0	0	0	0	Egypt
	Israel	1	0	0	0	0	0	Israel
	United Arabic Emirates	0.47	0	26696	0	1230	5140	Singapore, Israel
	Saudi Arabia	0.39	11	47414	0	0	10578	Malaysia, Singapore

Source: Research findings

The reference set also shows that inefficient countries (Indonesia, India, UAE, Saudi Arabia) can use which countries as accurate model in tourism services to boost their efficiency level. For example, Malaysia, Singapore and Egypt can be reference set for India; Malaysia, Egypt and Israel as a reference set for Indonesia; UAE can use Singapore and Israel for planning, and, finally, Saudi Arabia can use Malaysia and Singapore as reference sets.

Slacks-based measure estimation showed that in East Asia, some countries are efficient in tourism field including Malaysia, Singapore, and Thailand and Indonesia. India and China with 0.82, 0.87 and 0.84 amount are inefficient because of the surplus in input compared to output of tourism industry. Iran, the UAE and Saudi Arabia are inefficient countries between the Middle East countries by amount 0.95, 0.76 and 0.8. This means that Iran is the most inefficient country in tourism among the Middle East countries. So, the more attention of authorities to planning is important for tourism industry. As the table shows, Turkey, Egypt and Israel have been working efficient in this industry.

According to the set of references, Iran can choose Malaysia as an efficient country in tourism for future planning, which based on the religious requirements is an affordable country for tourism policy makers in Iran. Also, Indonesia, India and China can use Malaysia's policies to promote the efficiency in tourism industry in the East Asian countries. Singapore is a proper model for the UAE and Saudi Arabia, among the Middle East countries, to develop and make efficient their tourism industry.

Table 12.2
The efficiency of selected countries and surplus inputs in 2013

| Location | Decision-making unit (country) | Efficiency | Additional inputs | | | Reference set |
			Input 1 (the number of employees)	Input 2 (Investment)	Input 3 (the number of hotels)	
East Asian countries	Indonesia	0.18	2815	8804	8245	Malaysia
	India	0.13	21825	25387	13957	Malaysia
	Malaysia	1	0	0	0	Malaysia
	Singapore	1	0	0	0	Singapore
	Thailand	1	0	0	0	Thailand
	China	0.16	21585	99199	25131	Malaysia and Singapore
Middle-eastern countries	Iran	0.5	271	1705	150	Malaysia
	Turkey	1	0	0	0	Turkey
	Egypt	1	0	0	0	Egypt
	Israel	1	0	0	0	Israel
	United Arabic Emirates	0.24	174	68691	1234	Singapore
	Saudi Arabia	0.2	395	135932	1874	Singapore

Source: Research findings

Based on the estimation of super-efficiency model, as the following table shows, Turkey, Singapore and Thailand respectively have been most effective among other countries. Ranking efficient units (units with rate higher than one) is as follows: (1) Turkey (2) Thailand (3) Singapore (4) Israel (5) Malaysia (6) Iran (7) Egypt. Super- Efficiency as the data envelopment analysis Shows that Indonesia, India, UAE and Saudi Arabia are inefficient units.

Table 12.3
The super-efficiency input-oriented based on BCC

Location	Decision-making unit (country)	Efficiency	Reference set
East Asian countries	Indonesia	0.26	Malaysia, Egypt and Israel
	India	0.20	Malaysia, Singapore and Egypt
	Malaysia	1.76	Malaysia, Thailand, Turkey and Egypt
	Singapore	10.16	Malaysia and United Arabic Emirates
	Thailand	10.47	China and Turkey
	China	Infeasible	-
Middle-eastern countries	Iran	1.45	Singapore, Egypt and Israel
	Turkey	18.19	Malaysia and China
	Egypt	1.29	Malaysia, Singapore and Iran
	Israel	3.17	Singapore and Iran
	United Arabic Emirates	0.47	Singapore and Israel
	Saudi Arabia	0.39	Malaysia and Singapore

Source: Research findings

The results based on the most productive scale size (MPSS) showed maximum productivity in Malaysia, Singapore and Thailand among East Asia, and Turkey, Egypt and Israel among the Middle Eastern countries in comparison with other active countries in tourism field. The results are compatible with output of previous models.

Table 12.4
The most productive scale size model results

Location	*Decision-making unit (country)*	*Z*	*Model's output(the country with maximum productivity or The most productive scale size)*
East Asian countries	Indonesia	4.64	–
	India	5.15	–
	Malaysia	1	MPSS
	Singapore	1	MPSS
	Thailand	1	MPSS
	China	4.64	–
Middle-eastern countries	Iran	1.49	–
	Turkey	1	MPSS
	Egypt	1	MPSS
	Israel	1	MPSS
	United Arabic Emirates	2.57	–
	Saudi Arabia	3.39	–

Source: Research findings

5. CONCLUSIONS AND RECOMMENDATIONS

Evaluating the performance of a sector has essential role in future decision making. In this regard, the efficiency and productivity of different sectors should be calculated to monitor the economic growth in future decision-making. Evaluating the efficiency of Iran and compare it with active countries in tourism filed can has a significant role in this regard. DEA model was used to compare the tourism industry among selected countries in 2013. The envelopment BCC method and input-oriented form was selected among different estimated models of DEA. Because, the managers can planning better based on the input than outputs in the field of tourism, and, maximizing mode was used for estimate since the goal is to maximize the output of tourism.

The envelopment BCC method and input-oriented form in estimation showed that India, Indonesia, Saudi Arabia and the United Arab Emirates are inefficient respectively, in contrast, other countries are efficient in tourism industry.

Indonesia is inefficient in this industry due to surplus in input 1, the number of employees, and, in contrast, the deficit in output 1, the number of international tourists. In other words, the country against the number of employees in tourism sector could not attract enough tourists. Also, India has the same reason for inefficient performance in tourism sector.

The UAE is inefficient because of surplus investment. In other words, it has deficit in output, including the number of tourists and tourism income, in contrast to the amount of investment in tourism sector.

However, Saudi Arabia could not attract sufficient income in contrast to the investment, so, is inefficient in this industry.

In SBM model estimation, Iran and China joined to inefficient countries in tourism filed. So, they would include 6 countries: India, Indonesia, Iran, China, UAE and Saudi Arabia. In this estimation, the output shows that the surplus in three inputs to tourism industry; consist of the number of employees, investment and the number of hotels; is the reason for inefficient in these countries, and they could not earn enough output. The results in super-efficiency model, which is make possible ranking efficient units, showed efficient countries in tourism services (1) Turkey (2) Thailand (3) Singapore (4) Israel (5) Malaysia (6) Iran (8) Egypt.

In calculation of the most productive countries by MPSS model, the result showed countries with maximum efficiency in the East Asia counties including Malaysia, Singapore and Thailand, and the Middle East, Turkey, Egypt and Israel, in comparison with other countries in the field of tourism.

In summary, specifically for Iran, we can say it had not been efficient or had very low efficiency, in tourism services and industry. Inefficiency of Iran is 50 percent by SBM model, which indicated taking the advantage of potentials in tourism field is needed. In other words, only 50 percent of resources were used in the industry, and, increasing the outputs is needed. Comparison between statistics and research outputs shows that planning in Iran's tourism industry is much less than other countries, despite historical and tourism monuments in this country. For instance, in spite of the UAE does not have Iran's historical background and is much smaller than that, has equal hotels and doubled number of tourism. So, Iran would be an efficient country by super-efficiency model, but in low rank and with very small amount.

The following suggestions can be made to improve the efficiency of tourism industry in Iran:

– According to the results by SBM model, Iran can use Malaysia (as reference set) planning model in tourism industry to improve its performance. Some actions of Malaysia to facilitate tourists entry into the country can provided for Iran:

- Electronic visa for many countries and possibility of online visa application and filling forms by tourists

- Signing bilateral agreements with countries in order to receive tourists and introduction of tourism

- Creating hotels and resorts and pristine places such as creating suitable sites for set up camps, compatible hotels with ecosystems

- Strengthening rail, air and road infrastructure (for example, KL city bus station is one of the best equipped and modern bus terminals for Asia passengers)

- Broadcast documentaries about Malaysia and its tourism attractions from television networks such as China and Arabic countries

- Tourism looks to all different issues of country to attract tourists including religion, traditional medicine, nature, etc.

- Considering the political and administrative authorities to tourism in various levels, and establishment culture, art and tourism ministries in 1987

– According to that Singapore is a reference set for Iran based on the super-efficiency model, can offered some of the country's successful efforts in attracting tourists for Iran:

- Environmental programs and continue on the protection of natural and cultural heritage

- Security and existence one of the lowest crime rates

- Existence of English as one of the four official languages, and, therefore, more easiest communication and interactions of tourists

- Very smooth and extremely fast public transport system, and, as a result, facilitation of access to the inland areas of the country

- Prominent role of Singapore tourism board and the appropriate activities to attract tourists (This board, which began its work in 2004, led to disappeared Singapore tourism industry's ups and down)

- Existence of offices and branches of Singapore tourism Board in many countries to marketing and increasing international recognition of the country

- Planning and careful analysis of strengths and weaknesses on tourism in 10 different scopes and offering solutions

– According to the results and currently tourism industries' outputs in Iran (the number of inbound tourists and tourism income) the optimal value of inputs to industry to increase efficiency and productivity should include:

- The number of employees in tourism sector has 271 thousand surpluses and based on the outputs the number of optimal employees is 132 thousand people

- The investment has 1705 million dollars surplus and according to the outputs, the optimal amount should be 755 million dollars

- There are 149 surplus hotels in Iran based on the outputs which the optimal number is 938 hotels

– Because, reducing on industries' input surplus cannot be suggested, so, for tourism planning and increasing efficiency, we must looking for ways and suggestions to increase the output of industry (increasing the number of foreign tourists and tourism income), to established the balance between input and outputs in order to efficiency. On the other hand, given the great potential of Iran to attract tourists and revenues, because of historical value, in other words, there is possibility of increasing the output of industry. Therefore, the following actions is suggested to increase the outputs and reduce the surplus inputs, in order to improve the efficiency of tourism in Iran:

- Efforts to reduce the negative news about Iran and reinforce effective advertising

- Reducing social and religious restrictions for foreign tourists

- Reducing political tensions in relations with other countries

- Prevent the occurrence of internal events against foreign tourists

- Prevent the multiply of decision making and the strengthening of the main organizations responsible for tourism industry

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