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ASSESSMENT OF EFFICIENCY AND PRODUCTIVITY IN PUBLIC AND PRIVATE INSURANCE COMPANIES

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ABSTRACT

The purpose of the present study is to investigate the efficiency and productivity of Iranian public and private insurance companies; therefore, the research problem is concerned with the mutual effect of the mentioned variables on each other. Model inputs include the number of human forces, the number of branches across the country, and total properties, and the outputs include paid losses, the number of issued insurance license, the number of compensated losses, earnings on production insurance, and the net profit of the company. The inputs and outputs of the study were determined after consulting with numerous experts and reviewing of previous research on combinative models. The present study is an applied research in terms of objective. The research sample consists of nineteen public and private insurance companies, and the data obtained for the years 2006-2012 (1385-1391 in Persian Calendar) were examined using data envelopment analysis and Malmquist Index. After assessment of academic and technical efficiency, the factors affecting efficiency were identified and inefficient companies were provided with recommendations to improve their level of efficiency. To do so, first, the efficiency of the companies during the years 2006-2012 was determined using data envelopment analysis and then the rate of efficiency growth during the studied period was determined for each companies using Malmquist Index.

Keywords: *Efficiency, Productivity, Data Envelopment Analysis, Public and Private Insurance Companies, Malmquist Index.*

INTRODUCTION

In recent years, efficiency and productivity have attracted great attention in the country. In The Fourth Development Plan improving of attitudes, methods and management systems and, generally, improving of the productivity have been considered as one of the sources of economic growths. The country's insurance industry, as one of the financial institutions, contributes a lot to economic growth; accordingly, its performance may stimulate other sectors of the economy. In fact, the small amounts that insured give away to insurance companies, not only pay damage and restore activities and provide financial security in case of different events, but also make up a large amount that contributes to economic cycle (Hosseinizadeh Eskandar, 2005). Therefore, economic growth and development of each country depends on the development of the insurance industry. The developed countries often enjoy more developed insurance industry. As long as the insurance industry will not be able to provide the necessary premises for the safe and secure presence of both internal and across borders investors in different sectors of the economy, we cannot expect a country to achieve economic growth and excellence. Therefore, the insurance industry can be considered as one of the most important factors in accelerating the

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growth of the national economy of each country (Hashemi, 2007). With this in mind, it is easy to say that inefficiencies in the insurance industry not only affect the quality of life style, but also impede the improvement of efficiency in the economic sectors, which means that the objectives of economic development of the country cannot be achieved (Kazemi Kasmaei, 2004). In recent years, the insurance industry following joining to WTO has faced new challenges, such as the entry of powerful foreign insurance industries and the growing number of domestic insurance companies. Therefore, in this dynamic environment, existing insurance industries for survival and competitions needs to evaluate the proper functioning and, if necessary, improve their efficiency (Momeni and Shahkh, 2009). As mentioned before, it is clear that the issue of productivity is of great concern for authorities so it has received great attention in The Economic Transformation Program; insofar as an independent workgroup has been formed for that. Furthermore, enhancing the efficiency of insurances is one of the ten proposed axes for amendment of the insurance system (Ramezani, 2009). The conventional techniques, used for the management efficiency of insurance companies, cannot provide sufficient managerial information for experts in order to identify inefficient factors of inefficient units and to gain the advantages and disadvantages of competitive strategies. But Data Envelopment Analysis can overcome this problem. Therefore, this research combines the efficiency of data envelopment analysis (DEA) and Malmquist Productivity Index (MPI) to evaluate efficiency and productivity. Both techniques are based on linear programming and estimate the efficiency of decision units (e.g. insurance economy)

THEORETICAL FRAMEWORK

Following the evolution of economics, the concepts of efficiency and productivity have been evolved. Especially, in the last two decades, its measurement based on theory of economics has been suggested and practiced. Today, efficiency and productivity is assumed as a perspective and viewpoint manifested in all areas of human life and work and is considered as the source of economic development. This perspective could lead to best possible result with careful planning. Therefore, insurance industry is considered as one of basic pursuit in economic development of each country that require careful planning (Emami Meyboodi, 2005).

Efficiency

Efficiency is described as the proper implementation of tasks in organization i.e. the decisions which are made with the aim of reducing expenses, increasing production and improving the quality of the product. (Taheri, 1999). Efficiency is defined as the ratio of the achieved actual yield to the standard and determined (expected) output or the ratio of the amount of work that is done to the amount of work that is required to be done.

Efficiency is a relative concept and actually is defined as the comparison of actual performances to ideal performance. That is to say, efficiency is related to a way of utilizing of resources. So, it manifests the beneficial usage of resources. Farrell examines three types of efficiency: technical efficiency, allocative efficacy, economic efficiency. The technical efficiency is defined as the relationship between inputs and output, and the way in which inputs are changed into products. Allocative efficiency is the ability of economic entity in optimal combination of factors in regard to their prices. Economic efficiency is obtained by the multiplication of technical and allocative

efficiency which is defined as the ability of economic entity in achieving maximum possible return according to price and level of inputs (Zaraynezhad and Yousefi Hajiabad, 2009).

Productivity

Human efforts have always been concentrated on achieving the maximum outcome with the minimum of available features and facilities, these efforts can be called the power of achieving productivity. Productivity is one of most important characteristic of a system and in fact its main purpose. Numerous definitions of productivity have been suggested. In the view of Iran's productivity organization, it is a rational approach to life and work, in order words it is a culture aimed at making activities smarter for a better exalted life. Productivity is the result of efficiency and effectiveness. In fact, productivity is the reduction of losses and maximization of the services with existing feature and also improvement of the service quality for higher returns (Saffarzade et al., 2007). From the viewpoint of the cooperative organization, productivity is the result of a fraction that obtained from the division of the amount or value of a product to the amount or the value of one of the factors of production (AbbAsian and Mehregan, 2007).

REVIEW OF LITERATURE

Cummins et al. in their essay examine the technical efficiency in American insurance companies with separate estimation of enterprises in three different sizes of small, medium and big using boundary function for the period 1980-1988. The results reveal that the big enterprises have on average 90 percent efficiency, and medium and small enterprises have 80 and 88 percent respectively.

Pulic (2000) examines the farmers in different areas of Butahta and suggests that productivity growth in animal husbandry is more than others and more importantly, this growth is the result of technological changes because technical efficiency have diminished.

Fan et al. estimate the expenses function and efficiency of insurance companies in 14 European countries by applying maximum likelihood in the period 1995-2001. Therefore, they consider separated lines of production for life, non-life and mixed insurance companies. They also examine the enterprises' anomaly effects on measuring economic scale and also effects of enterprises' size and market structure on economic efficiency. The study shows that in the surveyed period most European insurance companies were at stage of reducing their expenses. Also the enterprise size and internal market share are significant variable for economic efficiency.

Yao (2005) examine productivity changes in China industry by applying Malmquist during 1995- 2006 period. Among four of five-year plans of economic development in these years, productivity studied in 1978-1983. The productivity of workforce and capital were measured. The chemical industries and extraction of metal were the main studied industries. The results reveal that in chemical industries there is no extra workforce but in metal extraction industries due to extra workforce in 1980, productivity has decreased.

Eling, M& Luhnen in their study assess efficiency in 6462 companies in 36 countries in the period 2007-2010 by using data envelopment analysis. The results show that no country have 100 percent efficiency.

Yang (2010) provides his model of data envelopment analysis of efficiency in Canadian life and health insurance. Particularly the new model allows for integrating of production and

investment performance in insurance companies. This study emphasizes particularly on how to provide the result of data envelopment analysis rather than providing guidelines for management of factors. Results show that Canadian life and health insurance industry in the surveyed period operates efficiently.

George Assaf et al. examine technical efficiency in Saudi banks in 2011. Data are collected for the period 1999-2007. Research inputs include 1) the total of employed force 2) fixed assets 3) total deposit and outputs include 1) customers' loans 2) securities and 3) interbank loans. The results suggest that Saudi banks improved technical efficiency since 2004 which includes banks which are operating with foreign investment.

Laiho et al (2010) examine the relationship between efficiency, productivity and ownership structure of Taiwanian brokerage firm. The results show that there is no correlation between size of board, the percentage of ownership of board and percentage of manger ownership and efficiency. But there is a positive significant association between major external stakeholder and efficiency.

Kao, C& Hwang (2011) use data envelopment analysis for assessment of management performance in 24 non-life insurance companies. The conclusion indicates that rather than measuring efficiency of insurance companies as a whole and once, it is better to examine the efficiency of the insurance company in two stages which lead to better manifestation of management efficiency and help insurance company to be more aware of their own advantages and disadvantages.

Du (2010) in a study titled "Performance Evaluation of DEA- Based Virtual Library of Information Resources", integrates data envelop analysis and AHP for analyzing and ranking of 25 virtual libraries.

Noh (2011), in his essay "Measurement of the Performance of Information Resources n University Libraries, Using the Data Envelopment Analysis Technique" studies American Digital University Libraries by analyzing the sensitivity of the indexes and concludes that the number of digital library references is the most sensitive index in this study.

Martin evaluates 52 departments of the University of Zaragoza using the data envelopment analysis model. In this study, inputs were distinguished in three categories of human resources, financial resources and material resources. By designing a new method as four methods of data envelop analysis evaluate the department performance and thus could identify 36 efficient departments.

Measuring Efficiency by Using Data Envelopment Analysis (DEA)

Suppose there is N decision unit with m input m and s output, the relative efficiency of each decision unit is obtained by calculating the following fractional planning model (Mehregan 2005 & Bal et al.2010):

where y_{rj} is the r^{th} output for the j^{th} decision unit, X_{ij} is the amount of input i for the decision unit j, u_r is the assigned weight to output r, vi is the assigned weight to input i and z is the score of efficiency of the unit under study.

In the above model, the efficiency score of each unit is obtained by dividing the sum of balanced outputs to the sum of balanced input with a score less than or equal to one. If the score 1 is obtained the unit is efficient, if it be less than one it is inefficient. Although every day a new model of data envelop analysis is added and each one is specialized but the basis of all of them is original analysis designed by the Charnes, Cooper and Rhodes. Among these we can refer to

Charnes, Cooper and Rhodes model (CCR) which its assumption of fixed return to (CRS) was utilized in this analysis. Mathematical analysis of the model is as following (Mehragan 2006& Bal et al 2010):

Input Axis	Output Axis

Another model is introduced by Bancar, Charens and Cooper, BCC, which employ the assumption of fixed return to VRS scale in the analysis, which is defined as following: (Mehregan, 1385 and Bal et al., 2010).

Input Axis	Output Axis

In fact, the basic models of data envelop analysis based on the nature of application divided into input-oriented models and output-oriented models. The applied pattern would be input – oriented if in analysis process try to minimize the inputs, at fixed output levels. The applied pattern would be output-oriented, if in analysis process try to maximized output levels, at fixed input levels (Mehregan, 2006).

Evaluating Productivity by Using Malmquist Index

Suppose our hypothesized DMU contains a combination of input-output) x_i^t, y_i^t (in period t and (x_i^{t+1}, y_i^{t+1} (in period t+1. Two changes may occur between period t and t+1. First because of technical development, DMU can have more output in exchange of input in period t+1 toward period t. in this case, the structure of input-output in the period t+1 with the technology of period t is impossible. Therefore, technical changes have taken place. Second, company can experience changes in technical efficiency if its operation point in period t+1 be closer to the boundary (in relative condition) in comparison with period t. Malmquist productivity index also measure changes in the boundary during time and also changes in boundary efficiency for different period. To do so, it is necessary to use the distance function Dt (Dt + 1), which indicates the production boundary function at time t (t + 1). Index of changes in output-oriented Malmquist proficiency index during period t and t+1 is as following:

$$MPI = \left[\frac{D_i^t(x_i^{t+1},\ y_i^{t+1})}{D_i^t(x_i^t,\ y_i^t)} \frac{D_i^{t+1}(x_i^{t+1},\ y_i^{t+1})}{D_i^{t+1}(x_i^t,\ y_i^t)}\right]^{1/2}$$

Inefficient units are those below the boundary with a MPI value less than one that represents a decrease in the growth and performance of total manufacturing factors in the last year.

If the real assumption of inefficient enterprises in the industry is introduced into the model, Malmquist Index is obtained as the following:

$$=E^{(t+1)} \times T^{(t+1)}$$

Where calculated the relative changes in total efficiency, changes in efficiency and technological changes with a transfer in product boundary function between period t and t+1

The above analysis is based on assumption of fixed return to CRS index. By applying the assumption of variable return to VRS index, changes in efficiency is also divided into its element

that is changes of net technical efficiency (managerial efficiency) and changes in scale efficiency (Emami Meybodi et a. 2011)

Technical changes × scale efficiency changes × management efficiency changes = total proficiency changes

RESEARCH METHODOLOGY

The present study seeks out to find the efficiency and productivity of Iranian public and private insurance. Therefore, it is practical and also descriptive –analytic, and, it also examines the correlation between variables.

Data collection

Data collection is library based therefore the required data is collected from book and journals in English and Persian and essays downloaded from internet and the rest of it have be collected from statistical yearbook of central insurance of Islamic republic of Iran.

Data Analysis

In this research by applying WINQSB software and data envelop analysis and CCR model of output-oriented, the units are compared in term of their efficiency and inputs and outputs of each unit are examined. Applying of this model in practical domain turns out to be completely objective, precise and powerful. The model is output oriented because company management can have better control on outputs and for enhancing efficiency mostly tends to increase the output rather than decreasing the inputs. The following section examines productivity by applying DEAP software and Malmquist model. Both techniques are linear and estimating the efficiency of decision making unit. In this analysis inputs and outputs should be related to proficiency and productivity and allow for comparison of their relative efficiency and productivity of insurance and their capabilities with other companies. For achieving growth and development, this approach offers a direct beneficial comparison between similar industrial companies.

Statistical population and sample of the study contains the whole of Iran's public and private insurances. This population includes Iran, Dana, Asia, Alborz, Moallem, Tosea, Razi, Karafarin, Sina, Mellat, Omid, Novin, Etkaye Amin, Hafez, Dey, Saman, Pasargad insurance companies and the period is seven years from the April 2006 to March 2012.

Input indexes are described as the factor that by adding one unit of it to the system and when other condition are constant, reduce efficiency. Output indexes are the factor that by adding one unit to the system and by supposing other condition are constant, increase efficiency (Siriopoulos & Tziogkidis, 2010). The first step in assessing relative efficiency is by using the data window analysis model, choosing the input and output indicators of the model according to past research and the consensus of experts and by using multi-criteria decision making models. Table 1 presents the input and output indexes of the data analysis.

Table 1: The input and output indexes of the data analysis

Input	X1	Number Of Employees
	X2	Number Of The Total Branches
	X3	The Sum Of Total Assets

Output	Y1	Damage Paid
	Y2	The Number Issued Insurances
	Y3	The Number Of Paid Losses
	Y4	The Income Of The Produced Insurance Fee
	Y5	Net Profit And Loss

Research Questions

This study is based on a mathematical model and therefore does not have hypothesis, and, it is trying to answer the following research questions:

1. What is the rate of efficiency of insurance companies (public and private)?
2. What is the rate of efficiency growth of insurance companies?

RESEARCH FINDINGS

What is the rate of The Efficiency of Insurance Companies?

Analysis of Efficiency and Ranking of Companies in 2006

As the results of Table 2 indicate the efficiency of insurance companies for 2006 is in the range of zero and one. Companies with efficiency 1 considered as efficient and companies with efficiency below 1 as inefficient. Due to the fact that in the data envelopment analysis, the calculated weights are the most favorable weights to maximize the efficiency of units, it is expected that the efficiency of all units be equal to one. But as you see in the table, it is not the case and there are significant differences in the efficiency of the units. Of the 19 companies surveyed this year, 10 companies representing approximately 53% of the companies have efficiency 1 (Iran, Dana, Asia, Parsian, Karafarin, Mellat, Moein, Etkaye Amin, Hafez and Novin) the lowest efficiency is for Moallem insurance with the score 0.213. This score indicates that the management of moallem insurance by using of just 213 % of available sources offers this level of service as company's output. Column four of table 2 shows units ranking. In the fifth column, reference companies have been introduced and serve as a model for inefficient companies. This column identifies reference companies according to their priority and their reference factor for the inefficient companies. For example, Novin, Moein and Mellat companies have been selected as the reference for the inefficient Pasargad insurance company. In other words, the virtual unit for the Pasargad insurance company is made up by adding 0.001, 0.87 and .259 units of Mellat, Moein and Novin insurance company, respectively. Therefore, Pasargad insurance with higher inputs offers lower outputs. Therefore, the cause of its inefficiency is clear. In other words, there is another (virtual unit) which with input less than Pasargad insurance, provides higher output.

Table 2: Efficiency of Unit in 2006

Row	Company	Efficiency	Rank	Reference units
1	Iran	1	1	due to its efficiency there is no need for reference unit
2	Dana	1	1	due to its efficiency there is no need for reference unit
3	Asia	1	1	due to its efficiency there is no need for reference unit
4	Alborz	0.727	12	(Etkaye Amin)5.97+(Moein)2.54+(Mellat)0.516+(Dana)0.490+(Iran) 0.044
5	Moalem	0.213	19	(Etkaye Amin)1.080 +(Novin)0.402+(Moein)0.357+(Dana)0.022
6	Parsian	1	1	Due to its efficiency there is no need for reference unit

7	Tose'a	0.415	16	(Etkaye Amin)0.318+(Moein)0.930+(Mellat)0.004+(Dana)0.005
8	Razi	0.440	15	(Etkaye Amin)488+(Mellat) 0.324+(Iran)0.019
9	Karafarin	1	1	due to its efficiency there is no need for reference unit
10	Sina	0.658	13	(Etkaye Amin)0.232+(Moein)0.930+(Mellat)0.014+(Iran)0.021
11	Mellat	1	1	due to its efficiency there is no need for reference unit
12	Moein	1	1	due to its efficiency there is no need for reference unit
13	Omid	0.325	17	(Etkaye Amin) 268+(Moein)2.28+(Dana)0.029+(Iran)0.008
14	Etkaye Amin	1	1	due to its efficiency there is no need for reference unit
15	Hafez	1	1	due to its efficiency there is no need for reference unit
16	Dey	0.325	17	(Etkaye Amin)268+(Moein)2.28+(Dana)0.029+(Iran)0.008
17	Saman	0.642	14	(Novin)0.774+(Etkaye Amin)1.34+(Mellat)0.009
18	Novin	1	1	due to its efficiency there is no need for reference unit
19	Pasargad	0.852	11	(Novin)0.259+(Moein)0.087+ (Mellat)0.001

Analysis of Efficiency and Ranking of Companies in 2007

As the results of Table 3 indicate the efficiency of insurance companies for 2007 is in the range of zero and one. We consider companies with efficiency 1 as efficient and with efficiency below 1 as inefficient. Due to the fact that in the data envelopment analysis, the calculated weights are the most favorable weights to maximize the efficiency of units, it is expected that the efficiency of all units be equal to one. But as you see in the table, it is not the case and there are significant differences in the efficiency of the units. Of the 19 companies surveyed this year, 9 companies representing approximately 47% of the total companies have efficiency 1(100 %). these companies are Iran, Dana, Asia, Toesea, Karafarin, Mellat, Moein, Etkaye Amin, Hafze. The lowest efficiency is for Omid insurance with the score 0.270. This score indicates that the management of Omid insurance by using of just 270% of available sources offers this level of service as company's output.

Table 3: Efficiency of Units in 2007

Row	Company	Efficiency	rank	Reference units
1	Iran	1	1	due to its efficiency there is no need for reference unit
2	Dana	1	1	due to its efficiency there is no need for reference unit
3	Asia	1	1	due to its efficiency there is no need for reference unit
4	Alborz	15	0.690	(Moein)0.850+(Mellat)0.622+(Karafarin).166+(Dana)0.193+ (Iran) 0.044
5	Moalem	16	0.554	(Moein)0.632+(Mellat)0.059+(Karafarin) 0.356+(Tosea)0.206
6	Parsian	11	0.839	(Mellat) 265+(Iran) 0.013
7	Tose'a	1	1	due to its efficiency there is no need for reference unit
8	Razi	0.822	13	(Mellat) 1.42
9	Karafarin	1	1	due to its efficiency there is no need for reference unit
10	Sina	0.925	10	(Hafez) 484+(Moein)1.07+(Karafarin)0.136+(Iran)0.012
11	Mellat	1	1	due to its efficiency there is no need for reference unit
12	Moein	1	1	due to its efficiency there is no need for reference unit
13	Omid	0.270	19	(Hafez) 0.141+(Moein)0.109+(kar afrin)0.034

14	Etkaye Amin	1	1	due to its efficiency there is no need for reference unit
15	Hafez	1	1	due to its efficiency there is no need for reference unit
16	Dey	0.514	17	(Moein)1.37+(Mellat)0.094+(Karafarin)0.580+(Dana)0.019+(Iran)0.008
17	Saman	0.790	14	(Etkaye Amin)0.914+(Moein))0.068+(Dana)0.107
18	Novin	0.835	12	(EtkayeAmin)0.653+(Moein)0.416+(kar afrain)0.143+(Dana)0.021
19	Pasargad	0.462	18	(Hafez)0.611+(Moein)0.053+(Mellat)0.063+(Karafarin)0.062

Analysis of Efficiency and Ranking of Companies in 2008

As the results of Table 4 indicate the efficiency of insurance companies for 2008 is in the range of zero and one. We consider companies with efficiency 1 as efficient and with efficiency below 1 as inefficient. Due to the fact that in the data envelopment analysis, the calculated weights are the most favorable weights to maximize the efficiency of units, it is expected that the efficiency of all units be equal to one. But as you see in the table, it is not the case and there are significant differences in the efficiency of the units. Of the 19 companies surveyed this year, 10 companies representing approximately 53% of the total companies have efficiency 1(100 %). these companies are Iran, Dana, Asia, Parsian, Razi, Sina, Mellat, Moein, Etkaye Amin, Hafze. Omid insurance has the lowest efficiency score of 0.262. This score indicates that the management of Omid insurance could by using of just 262% of available sources offers this level of service as company's output.

Table 4: efficiency of units in 2008

row	company	efficiency	rank	Reference units
1	Iran	1	1	due to its efficiency there is no need for reference unit
2	Dana	1	1	due to its efficiency there is no need for reference unit
3	Asia	1	1	due to its efficiency there is no need for reference unit
4	Alborz	0.932	11	(Hafez)7.71+(Etkaye Amin)0.75+(Moein)2.19+(Asia)0.3+(Dana)0.045
5	Moalem	0.679	18	(Hafez)4.77+(Razi)0.380+(Asia)0.044
6	Parsian	1	1	Due to its efficiency there is no need for reference unit
7	Tose'a	0.8645	13	(Hafez)0.328+(Etkaye Amin)0.123+(Moein)0.056+(Razi)0.223
8	Razi	1	1	due to its efficiency there is no need for reference unit
9	Karafarin	0.725	16	(Hafez)10.01+(Moein) 0.072+(Asia)0.014+(Dana) 0.077
10	Sina	1	1	due to its efficiency there is no need for reference unit
11	Mellat	1	1	due to its efficiency there is no need for reference unit
12	Moein	1	1	due to its efficiency there is no need for reference unit
13	Omid	0.262	19	(Hafez)0.309+(Moein)0.004+(Asia)0.003
14	Etkaye Amin	1	1	due to its efficiency there is no need for reference unit
15	Hafez	1	1	due to its efficiency there is no need for reference unit
16	Dey	0.905	12	(Hafez)0.443+(Moein)0.966+(Asia)0.036+(Dana)0.030+(Iran)0.012
17	Saman	0.8644	14	(Hafez)3.15+(Etkaye Amin)0.128+(Moein)0.529+(Razi)0.028+(Dana)0.007
18	Novin	0.709	17	(Hafez)2.66+(Moein)0.606+(Razi)0.115+(Dana)0.015

19	Pasargad	0.852	15	(Hafez)1+(Moein)2.18+ (Mellat)0.002

Analysis of Efficiency and Ranking of Companies in 2009

As the results of Table 5 indicate the efficiency of insurance companies for 2008 is in the range of zero and one. We consider companies with efficiency 1 as efficient and with efficiency below 1 as inefficient. Due to the fact that in the data envelopment analysis, the calculated weights are the most favorable weights to maximize the efficiency of units, it is expected that the efficiency of all units be equal to one. But as you see in the table, it is not the case and there are significant differences in the efficiency of the units. Of the 19 companies surveyed this year, 9 companies representing approximately 47% of the total companies have efficiency 1(100 %). these companies are Iran, Dana, Asia, Moallem, Tosea, Sina, , Mellat, Moein, Etkaye Amin. Omid insurance has the lowest efficiency score of 0.301. This score indicates that the management of Omid insurance could by using just 301% of available sources offers this level of service as company's output.

Table 5: efficiency of unit in 2009

row	company	efficiency	rank	Reference units
1	Iran	1	1	due to its efficiency there is no need for reference unit
2	Dana	1	1	due to its efficiency there is no need for reference unit
3	Asia	1	1	due to its efficiency there is no need for reference unit
4	Alborz	0.725	16	(Moein)0.455+(Mellat)0.183+(Asia)0.274+(Iran) 0.110
5	Moalem	1	1	due to its efficiency there is no need for reference unit
6	Parsian	0.979	12	(Etkaye Amin)0.242+(Mellat)0.983+(Iran)0.077
7	Tose'a	1	1	due to its efficiency there is no need for reference unit
8	Razi	0.988	11	(Etkaye Amin)1.70+(Tosea) 0.243+(Asia)0.088+(Iran)0.005
9	Karafarin	0.781	15	(Asia)0.038+(Iran)0.069
10	Sina	1	1	(Etkaye Amin)0.232+(Moein)0.930+(Mellat)0.014+(Iran)0.021
11	Mellat	1	1	due to its efficiency there is no need for reference unit
12	Moein	1	1	due to its efficiency there is no need for reference unit
13	Omid	0.301	19	(Etkaye Amin) 0.050+(Tosea)0.021+(Asia)0.003
14	Etkaye Amin	1	1	due to its efficiency there is no need for reference unit
15	Hafez	0.990	10	(Asia)0.0004+(Iran)0.004
16	Dey	0.711	17	(Moein)0.223+(Asia)0.041+(Iran)0.031
17	Saman	0.672	18	(Etkaye Amin)0.236+(Moein) 0.374+(Mellat)0.113+(Asia)0.084
18	Novin	0.853	14	(etaye amin)0.292+(Tosea)0.182+(Asia)0.047+(Iran)0.022
19	Pasargad	0.922	13	(Etkaye Amin) 0.941+(Moein)0.299+(Asia)0.057+(Iran)0.005

Analysis of Efficiency and Ranking of Companies in 2010

As the results of Table 6 indicate the efficiency of insurance companies for 2010 is in the range of zero and one. We consider companies with efficiency 1 as efficient and with efficiency below 1 as inefficient. Due to the fact that in the data envelopment analysis, the calculated weights are the most favorable weights to maximize the efficiency of units, it is expected that the efficiency of all units be equal to one. But as you see in the table, it is not the case and there are significant

differences in the efficiency of the units. Of the 19 companies surveyed this year, 7 companies representing approximately 37% of the total companies have efficiency 1(100 %). these companies are Iran, Dana, Tosea, Sina, Mellat, Moein, Etkaye Amin. Dey insurance has the lowest efficiency with score 0.301. This score indicates that the management of Dey insurance by using just 319% of available sources offers this level of service as company's output.

Table 6: efficiency of unit in 2010

row	company	efficiency	rank	Reference units
1	Iran	1	1	due to its efficiency there is no need for reference unit
2	Dana	1	1	due to its efficiency there is no need for reference unit
3	Asia	0.481	15	(Mellat)1.13+(Iran)0.428
4	Alborz	0.456	16	(Mellat)0.759+(Iran)0.222
5	Moalem	0.846	10	(Dana)0.324+(ian)0.027
6	Parsian	0.913	8	(Mellat)1.24+(Iran)0.053
7	Tose'a	1	1	due to its efficiency there is no need for reference unit
8	Razi	0.649	12	(Tosea)0.519+(Iran)0.049
9	Karafarin	0.603	13	(Mellat)0.512+(Iran)0.072
10	Sina	1	1	(Etkaye Amin)0.232+(Moein)0.930+(Mellat)0.014+(Iran)0.021
11	Mellat	1	1	due to its efficiency there is no need for reference unit
12	Moein	1	1	due to its efficiency there is no need for reference unit
13	Omid	0.332	18	(Tosea)0.023+(Iran)0.001
14	Etkaye Amin	1	1	due to its efficiency there is no need for reference unit
15	Hafez	0.683	11	(Mellat)0.024+(ian)0.004
16	Dey	0.319	19	(Mellat)0.221+(Iran)0.004
17	Saman	0.348	17	(Mellat)0.193+(Iran)0.069
18	Novin	0.878	9	(Tosea)0.38+(Iran)0.036
19	Pasargad	0.558	14	(Moein)0.027+ (Mellat)0.304+0.044

Analysis of Efficiency and Ranking of Companies in 2011

As the results of Table 7 indicate the efficiency of insurance companies for 2011 is in the range of zero and one. We consider companies with efficiency 1 as efficient and with efficiency below 1 as inefficient. Due to the fact that in the data envelopment analysis, the calculated weights are the most favorable weights to maximize the efficiency of units, it is expected that the efficiency of all units be equal to one. But as you see in the table, it is not the case and there are significant differences in the efficiency of the units. Of the 19 companies surveyed this year, 10 companies representing approximately 53% of the total companies have efficiency 1(100 %). these companies are Iran, Dana, Asia Moallem, Razi, Mellat, Moein, Etkaye Amin, dey and Novin. Dey insurance has the lowest efficiency with score 0.640. This score indicates that the management of Karafarin insurance by using just 640% of available sources offers this level of service as company's output.

Table 7: efficiency of unit in 2011

row	company	efficiency	rank	Reference units
1	Iran	1	1	due to its efficiency there is no need for reference unit
2	Dana	1	1	due to its efficiency there is no need for reference unit
3	Asia	1	1	due to its efficiency there is no need for reference unit
4	Alborz	0.935	12	(Dey)0.559+(Moein)0.207+(Asia)0.291+(Iran)0.037

5	Moalem	1	1	due to its efficiency there is no need for reference unit
6	Parsian	0.827	16	(Moein)2.54+(Iran)0.122
7	Tose'a	0.866	15	(Novin)0.067+(Asia)0.114+(Iran)0.06
8	Razi	1	1	due to its efficiency there is no need for reference unit
9	Karafarin	0.640	19	(Dey)0.324+(Moein)0.049+(Iran)0.078
10	Sina	0.879	14	(Dey)0.017+(Moein)0.603+(Iran)0.053
11	Mellat	1	1	due to its efficiency there is no need for reference unit
12	Moein	1	1	due to its efficiency there is no need for reference unit
13	Omid	0.670	18	(Novin)0.037+(Razi)0.003
14	Etkaye Amin	1	1	due to its efficiency there is no need for reference unit
15	Hafez	0.763	17	(Novin)0.03+(Razi)0.036+(Iran)0.0002
16	Dey	1	1	due to its efficiency there is no need for reference unit
17	Saman	0.974	11	(Novin)0.142+(Dey)0.047+(Moein)0.05+(Asia)0.09
18	Novin	1	1	due to its efficiency there is no need for reference unit
19	Pasargad	0.899	13	(Novin)0.241+(Dey)0.667(Moein)0.26

Analysis of Efficiency and Ranking of Companies in 2012

As the results of Table 8 indicate the efficiency of insurance companies for 2012 is in the range of zero and one. We consider companies with efficiency 1 as efficient and with efficiency below 1 as inefficient. Due to the fact that in the data envelopment analysis, the calculated weights are the most favorable weights to maximize the efficiency of units, it is expected that the efficiency of all units be equal to one. But as you see in the table, it is not the case and there are significant differences in the efficiency of the units. Of the 19 companies surveyed this year, 9 companies representing approximately 47% of the total companies have efficiency 1(100 %). These companies are Iran, Asia, Toea, Sina, Razi, Mellat, Moein, Etkaye Amin and Novin. Omid insurance has the lowest efficiency with score 0.422. This score indicates that the management of Omid insurance by using just 422% of available sources offers this level of service as company's output.

Table 8: efficiency of unit in 2012

row	company	efficiency	rank	Reference units
1	Iran	1	1	due to its efficiency there is no need for reference unit
2	Dana	0.865	13	(Tosea)0.111+(Iran)0.131
3	Asia	1	1	due to its efficiency there is no need for reference unit
4	Alborz	0.760	16	(Novin)0.717+(Moein)0.553+(Sina)0.024+(Iran)0.124
5	Moalem	0.647	17	(Novin)0.502+(Iran)0.031
6	Parsian	0.805	15	(Moein)2.57+(Sina)0.365+(Iran)0.093
7	Tose'a	1	1	due to its efficiency there is no need for reference unit
8	Razi	1	1	due to its efficiency there is no need for reference unit
9	Karafarin	0.594	18	(Moein)1.02+(Sina)0.095+(Iran)0.092
10	Sina	1	1	due to its efficiency there is no need for reference unit
11	Mellat	1	1	due to its efficiency there is no need for reference unit
12	Moein	1	1	due to its efficiency there is no need for reference unit
13	Omid	0.422	19	(Novin)0.035+(Moein)0.032+(Sina)0.007
14	Etkaye Amin	1	1	due to its efficiency there is no need for reference unit
15	Hafez	0.871	12	(Novin)0.046+(Etkaye Amin)0.094+(Iran)0.092
16	Dey	0.911	11	(Iran)0.105
17	Saman	0.839	14	(Novin)0.248+(Moein)0.466+(Sina)0.043+(Iran)0.015

18	Novin	1	1	due to its efficiency there is no need for reference unit
19	Pasargad	0.966	10	(Novin)0.984+(Moein)1+(Sina)0.065

What is the rate of productivity growth of insurance companies?

Malmquist productivity index have been used for calculating productivity, the result are as following:

Malmquist productivity index for 2007 in comparison with 2006

The obtained result from calculating Malmquist productivity index for insurance companies for 2007 in comparison with 2006 are shown in table 9

Table 9: results of Malmquist productivity index for insurances in 2007 in comparison with 2006

Companies	Changes in technical efficiency	Changes in net technical efficiency (managerial efficiency)	Changes in scale efficiency	Changes in technological efficiency	Malmaquest efficiency index
Iran	1	1.122	1	1	1.122
Dana	1	0.820	1	1	0.820
Asia	1	0.950	1	1	0.950
Alborz	1.009	1.042	0.921	1.095	1.051
Moallem	3.040	0.673	2.380	1.278	2.047
Parsian	0.839	1.562	1	0.839	1.310
Tose'a	2.414	0.528	2.091	1.154	1.275
Razi	1.949	0.916	1.624	1.200	1.785
Karafarin	1.734	0.650	1.708	1.016	1.128
Sina	1.356	0.783	1.103	1.229	1.061
Mellat	1	1.549	1	1	1.549
Moein	1	0.894	1	1	0.894
Omid	1.201	0.693	1	1.201	0.833
Etkaye Omid	1	0.366	1	1	0.366
Hafez	1	1	1	1	1
Dey	1.825	0.807	1.359	1.343	1.474
Saman	1.221	0.991	1.177	1.037	1.210
Novin	0.729	1.128	0.769	0.948	0.822
Pasargad	0.491	0.883	0.539	0.912	0.434

Table 9 indicates the changes of productivity and its elements for insurance companies comparing 2010 with 2011. According to this table, Malmquist productivity scale is obtained by index of changes of technical efficiency and changes of technical efficiency. In other words, companies which have positive growth in both indexes will surely have positive Malmquist efficiency index too. In this period based on the index of changes of technical efficiency, we observe negative growth for Parsian, Novin and Parsargad and positive growth for Alborz, Moallem, Tosea, Razi, Karafain, Sina, Omid, Dey, Saman insurance companies. Finally, according to Malmquist productivity index, Iran, Alborz, moallem, Parsian, Tosea, Razi, Karafarin, Sina, Mellat, Dey and Saman have positive productivity growth, Hafez is unchanged and other insurances have negative productivity index.

Malmquist productivity index for 2008 in comparison with 2007

The obtained results from calculating Malmquist productivity index for insurance companies for 2007 in comparison with 2006 are shown in table 10.

Table 10: results of Malmquist productivity index for insurances in 2008 in comparison with 2007

Companies	Changes in technical efficiency	Changes in net technical efficiency (managerial efficiency)	Changes in scale efficiency	Changes in technological efficiency	Malmaquist efficiency index
Iran	1	0.556	1	1	0.556
Dana	1	0.017	1	1	0.017
Asia	1	0.452	1	1	0.452
Alborz	1.105	0.549	1.071	1.032	0.607
Moallem	1.212	0.420	1.202	1.008	0.509
Parsian	1.150	0.793	1	1.150	0.912
Tose'a	0.829	0.430	0.891	0.930	0.356
Razi	1.215	0.727	1.032	1.178	0.884
Karafarin	0.698	0.027	0.699	0.999	0.019
Sina	1.134	0.534	1.046	1.084	0.605
Mellat	1	0.470	1	1	0.470
Moein	0.603	0.842	0.794	0.759	0.508
Omid	1.050	0.407	1	1.050	0.427
Etkaye Omid	1	1.629	1	1	1.629
Hafez	0.979	0.643	1	0.979	0.629
Dey	0.598	0.450	1.603	0.997	0.719
Saman	0.936	0.674	0.939	0.996	0.631
Novin	0.792	0.682	0.760	1.042	0.540
Pasargad	2.388	1.622	1.857	1.286	3.874

Table 10 indicates the changes of productivity and its elements for insurance companies comparing 2008 with 2007. According to this table, Malmquist productivity scale is obtained based on index of changes of technical efficiency and changes of technological efficiency. In other words, companies which have positive growth in both indexes will have positive Malmquist efficiency index too. Based on the index of changes of technical efficiency, we observe negative growth for Tosea, Karafarin, Moein, Hafez, Dey an Novin insurance companies and positive growth for alborz, Moallem, Parsian, Razi, Sina, Omid, pasargad insurance companies. Instead, there is no change in Iran, dena, Mellat, Etkaye Amin, insurance companies. Also, according to index of changes in technological efficiency there is negative growth for Tosea, Karafarin, Moein, Hafez, Dey and Saman and positive growth for Alborz Moallem, parsian, Razi, Sina, Omid, pasargad and Novin. Finally, based on the Malmquist productivity index, only Etkaye Amin and Pasargad insurance companies have positive growth and the rest of the companies have a negative growth for this index.

Malmquist productivity index for 2009 in comparison with 2008

The obtained results from calculating Malmquist productivity index for insurance companies for 2009 in comparison with 2008 are presented in table 9.

Table 11: results of Malmquist productivity index for insurances in 2009 in comparison with 2008

Companies	Changes in technical efficiency	Changes in net technical efficiency (managerial efficiency)	Changes in scale efficiency	Changes in technological efficiency	Malmaquist efficiency index
Iran	1	1.182	1	1	1.182

Dana	1	1.126	1	1	1.126
Asia	1	33.521	1	1	33.521
Alborz	0.851	1.251	0.870	0.978	1.065
Moallem	1.503	1.332	1.499	1.003	2.002
Parsian	0.900	1.058	0.999	0.902	0.952
Tose'a	1.118	0.911	1.065	1.049	1.019
Razi	0.963	0.925	1	0.963	0.891
Karafarin	0.952	0.984	1.039	0.916	0.936
Sina	1	1.339	1	1	1.339
Mellat	1	1.372	1	1	1.372
Moein	1.659	0.659	1.260	1.317	1.093
Omid	1.146	0.986	1	1.146	1.130
Etkaye Omid	1	0.975	1	1	0.975
Hafez	0.846	0.861	1	0.846	0.728
Dey	0.798	1.201	0.801	0.996	0.958
Saman	0.845	1.097	0.880	0.960	0.927
Novin	1.400	1.135	1.393	1.006	1.589
Pasargad	0.873	0.351	1	0.873	0.307

Table 11 indicates the changes of productivity and its elements for insurance companies comparing 2009 to 2008. According to this table, Malmquist productivity scale is obtained based on index of changes of technical efficiency and changes of technological efficiency. In other words, companies which have positive growth in both indexes will have positive Malmquist efficiency index too. Based on the index of changes of technical efficiency, we observe negative growth for Alborz, Parsian, Razi, Karafarin, Hafez, Dey, Saman, pasargad insurance companies and positive growth for Moallem, Tosea, Moein, Omid, Novin insurance companies. Instead, there is no change in Iran, Dana, Asia Mellat, Etkaye Amin, insurance companies. Also, according to index of changes in technological efficiency there is negative growth for Alborz, Parsian, Razi, Karafarin, Hafez, Dey, Saman, pasragad and positive growth for Moallem, Tosea, Moein, Omid andNovin. Finally, according to Malmquist productivity index, just Parsian, Razi, karafrain, Etkaye Amin, Hafez, Dey, Saman and pasrgad have negative growth and the rest have positive growth.

Malmquist productivity index for 2010 in comparison with 2009

Table 12 indicates the results of measuring the Malmquist productivity index for insurance companies comparing 2010 with 2009.

Table 12: the results of Malmquist productivity index for insurance for 2010 in comparison with 2009

Companies	technical efficiency changes	Changes in net technical efficiency (managerial efficiency)	Changes in scale efficiency	Changes in technological efficiency	Malmquist efficiency index
Iran	1	4.197	1	1	4.197
Dana	1	2.162	1	1	2.162
Asia	0.465	1.175	0.469	0.992	0.546
Alborz	0.722	1.562	0.654	1.104	1.128
Moallem	0.846	1.637	0.857	0.988	1.386
Parsian	1.051	0.903	0.917	1.146	0.950
Tose'a	1.079	1.053	1.054	1.024	1.137

Razi	0.672	1.206	0.662	1.014	0.810
Karafarin	0.905	1.182	0.840	1.077	1.070
Sina	1	0.185	1	1	1.185
Mellat	1	1.004	1	1	1.004
Moein	1	1.406	1	1	1.406
Omid	1.133	1.217	1	1.133	1.379
Etkaye Amin	1	0.675	1	1	0.675
Hafez	0.826	1.197	1	0.826	0.989
Dey	0.513	1.505	0.539	0.952	0.772
Saman	0.627	1.547	0.745	0.841	0.969
Novin	1.086	1.319	1.096	0.991	1.423
Pasargad	0.638	1.134	0.574	1.110	0.723

Table 12 indicates the changes of productivity and its elements for insurance companies comparing 2010 to 2009. According to the table, Malmquist productivity scale is obtained by index of technical efficiency changes and technical efficiency changes. In other words, companies which have positive growth in both indexes, mlam quist productivity index will be positive too. Based on the index of changes of technical efficiency insurances there is negative growth for Asia, Alborz, Moallem, Razi, karafrai, Hafez, Dey, Saman and pasargad and positive growth for Parsian, Tosea, Omid, Novin insurance. Instead, there is no change in Iran, Dena, Sina, melat, Moein and Etkaye Amin insurance. Also, according to index of changes in technological efficiency there is negative growth for Asia, Moallem, Hafez, Dey, Saman, and Novin and there is no change in Iran, Dena, Sina, Mellat, Moein and Etkaye Amin. Finally, based on the Malmquist productivity index, only Asia, parsian, Razi, Etkaye Amin, Hafez, dey, saman, pasargad insurance companies have negative growth and the rest have positive growth in this index.

Malmquist productivity index for 2011 in comparison with 2010

Table 13 indicates the obtained results of calculating the Malmquist productivity for insurance companies comparing 2011 to 2010

Table 13: the results of Malmquist productivity index for insurance companies comparing 2011 to 2010

Companies	technical efficiency changes	Changes in net technical efficiency (managerial efficiency)	Changes in scale efficiency	Changes in technological efficiency	Malmquist efficiency index
Iran	1	0.036	1	1	0.036
Dana	1	0.741	0.877	0.988	0.741
Asia	2.150	0.618	1	1	1.329
Alborz	2.003	0.656	0.831	0.986	1.314
Moallem	1.181	0.896	0.666	0.971	1.059
Parsian	0.906	1.174	1	0.839	1.063
Tose'a	0.866	0.877	2.091	1.154	0.760
Razi	1.546	0.607	1.509	1.200	0.937
Karafarin	1.039	0.650	1.041	1.016	1.025
Sina	0.830	0.783	0.843	1.229	1.061
Mellat	1	1.549	1	1	1.549
Moein	1	0.894	1	1	0.894
Omid	2.018	0.693	1	1.201	0.833
Etkaye Amin	1	0.366	1	1	1.042

Hafez	1.117	1	1	1.117	0.838
Dey	3.143	0.807	2.911	1.080	2.400
Saman	2.60	0.991	2.414	1.216	1.316
Novin	1.138	1.128	1.121	1.015	0.871
Pasargad	1.539	0.883	0.504	1.024	1.121

Table 13 indicates the changes of productivity and its elements for insurance companies comparing 2011 with 2010. According to this table, Malmquist productivity scale is achieved by index of changes of technical efficiency and changes of technological efficiency. In other words, companies which have positive growth in both indexes will have positive Malmquist efficiency index too. Based on the index of changes of technical efficiency, we observe negative growth for Parsian, Tosea, Sina and positive growth for Asia, Alborz, Moallem, Razi, karafrin, Omid, Hafez, Dey, Saman, Novin and pasargad insurance companies. Inversely, there is no change in Iran, Dena, Mellat, Moein, Etkaye Amin insurance companies. Also, according to index of changes in technological efficiency there is negative growth for Parsian, Tosea, Karafarin and Sina and no change for Iran, Dana, Mellat, Moein, Etkaye Amin. Finally, based on the Malmquist productivity index, only Iran, Dana, Tosea, Razi, Sina, Mellat, Moein, Hafez and Novin have negative growth and the others have positive growth.

Malmquist Productivity Index for 2012 in Comparison with 2011

Table 14 indicates the obtained results of measuring the Malmquist productivity for insurance companies comparing 2012 to 2011

Table 14: the results of Malmquist productivity index comparing 2012 to 2011

Companies	technical efficiency changes	Changes in net technical efficiency (managerial efficiency)	Changes in scale efficiency	Changes in technological efficiency	Malmquist efficiency index
Iran	1	1.401	1	1	1.401
Dana	0.866	0.816	0.877	0.988	0.707
Asia	1	0.788	1	1	0.788
Alborz	0.820	0.986	0.831	0.986	0.809
Moallem	0.647	0.688	0.666	0.971	0.445
Parsian	0.899	1.272	1	0.839	1.310
Tose'a	1.154	0.962	2.091	1.154	1.275
Razi	1	0.834	1.624	1.200	1.785
Karafarin	0.910	1.110	1.708	1.016	1.128
Sina	1.205	1.086	1.103	1.229	1.061
Mellat	1	0.852	1	1	1.549
Moein	0.872	0.894	1	1	0.894
Omid	0.593	0.693	1	1.201	0.833
Etkaye Amin	1	1.713	1	1	1.713
Hafez	1.141	0.864	1	1.141	0.986
Dey	0.910	1.233	0.936	0.974	1.124
Saman	0.873	0.933	0.864	1.010	0.814
Novin	1	0.881	1	1	0.881
Pasargad	1.030	1.036	1.132	0.910	1.067

Table 14 indicates the changes of productivity and its elements for insurance companies comparing 2011 to 2010. According to the table, Malmquist productivity scale is obtained by index of changes of technical efficiency and changes of technological efficiency. In other words,

companies which have positive growth in both indexes will have positive Malmquist efficiency index too. Based on the index of changes of technical efficiency insurances there is negative growth for Dana, Alborz, Moallem, Parsian, karafari, Moein, Omid, Dey and Saman and positive growth for Sina, Hafez, Pasargad Tosea insurance companies. Instead, there is no change in Iran, Asia, Razi, Mellat, etkaye Omid and Novin insurance companies. Also, according to index of changes in technological efficiency there is negative growth for Tosea, Karafarin, Sina, Hafez, and Saman and no change in Iran, Asia, Razi, Mellat, Etkaye Amin, and Novin. Finally, based on the Malmquist productivity index, only Iran, Parsian, Tosea, Karafarin, etekaye ami, Sina, Moin, Dey and Pasargad insurance companies have positive growth and the other have negative growth in this index.

CONCLUSION

Men have always sought out higher efficiency and recongized it as a path for achieving more profit and desirability. From the economic perspective, efficiency means allocating optimal sources, maximized using of resources, and tolerating minimum expenses with available facilities. Today, measuring of efficiency and productivity in various organizations and industries is one of the essential steps for comparing competitiveness level in the country's internal and external scope (Hassanzade, 2007). This study aims at investigating efficiency and productivity in public and private insurance companies operating in Iran with using hybrid model of data envelopment analysis and Malmquist efficiency index. Accordingly, the number of human force, the number of branches in the whole country, the total assets as inputs and payouts, the number of issued insurance policies, the number of payable damages, income insurance premiums and total net profits of the company as output indexes of the model for 19 public and private insurance companies in period 2006 to 2012 have been utilized. This study finds that among 19 surveyed insurance in seven-year periods only four insurance companies (Iran, Mellat, Moein, Etkaye Amin) which in fact contains 20 percent of the overall insurances were efficient in all periods and 15 insurance companies which cover nearly 79 percent of the whole companies have been efficient in at least one period. Therefore, the purpose of a service company like insurance companies is to reach the maximum efficiency level by keeping the level of inputs fixed. So with investigating efficiency score of different units, we concluded that efficient companies attempt to attract resources and allocate optimal resources and provide optimal services. With careful attention for recognizing efficient units based on the obtained score, we find that different factors like the number of employees and branches and the amount of assets have great impact on efficiency and productivity. Finally, we find that efficient units are mostly customer center which lead to an increase in efficiency. Therefore, those insurance with relatively low efficiency could enhance theirs by using the experiences of the mentioned successful banks which includes the following factors: employment of educated, polite and committed personnel, providing better education for personnel, using the new methods of management, being customer center, genuinely respect customers, offering different and versified services, utilizing updated information and technology. Also productivity results indicate that in the period 2006 to 2012, only Asia, Moallem, Parsain, Sina, Dey have the average productivity score above 1 and the other insurance companies have negative score. Furthermore, the results reveal that just Asia, Moallem, Parsian, Sina, Dey which their average

efficiency score in the surveyed range of the growth is more than 1, for other insurance companies the average efficiency score is negative during the period 2005-2011.

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