

MARKET STRUCTURE AND EFFICIENCY OF INSURANCE COMPANIES IN AZERBAIJAN REPUBLIC

¹HANIFEHZADEH LATIF

PhD, Ardabil Branch, Islamic Azad University, Ardabil, Iran

ABSTRACT

The main purpose of the present research is to determine appropriate structure concerning the size and volume of insurance companies in order to increase the performance, efficiency, and to decrease the average costs of production. Increasing the performance of an insurance company is effective in economic growth and development, monetary and financial stability and economic savings. Under consideration, statistical universe of this research is Azerbaijan insurance companies that have been active in insurance Companies market during 2009- 2010. In order to test the assumptions of the research, information about financial statements of insurance companies has been studied and analyzed during the three years of 2009 -2010 by using method "data envelopment analysis". Findings from the research show that insurance companies in Azerbaijan with large size and more share than market enjoy the highest performance compared to other companies.

KEYWORDS: Market structure– scale Efficiency – Economic Efficiency – Technical Efficiency-coefficient penetration

Improvement in market structure will lead to increase in performance and economic savings of insurance companies. Increase in economic savings at economic macro levels will result in increase in insurance coefficient penetration, satisfaction of insured parties and growth and flourish in insurance industry. Because of low insurance coefficient penetration, influence of insurance and lack production of insurance premium in Azerbaijan insurance industry it is necessary to done many investigations in the Azerbaijan in the insurance market. With comparing the influence coefficient of the insurance companies in Azerbaijan with world insurance companies, it becomes clear that influence coefficient at the year of 2010 in Azerbaijan is .52 and at the same time in the world are 6.98 and in the Europe are 7.47. Therefore it is necessary should be investigated the ways of increasing insurance premiums and increasing the coefficient influence of insurance in Azerbaijan. Using the advantages of increasing production capacity and increasing production insurance which has the influence coefficient that coefficient influence of insurance is the most important sign of economical and cultural development in the world could have development through insurance industry expansion .In order to measure the performance and efficiency of stock exchange companies, Fama and Fritch (1995) opened a new door in the field of researches on efficiency and performance measurement of companies (CAPM) by adding the two variables company size and ration of book value to stock market value together with fixing the weaknesses of rating model of capital assets [7].

In order to measure the performance of markets and economic savings and efficient use of limited resources, professional bodies in countries, and even as continental, are actively researching. In order to decrease the average costs of production, integration benefits and combining the companies have always been considered by economic managers and policy makers. One of the several effective factors in performance of companies and macro economy is the size of active companies in each industry. In case of insurance company, in the present research we are to introduce the best structure from the viewpoint of size and volume of the insurance company, which has the best performance and efficiency for realizing the performance of insurance market and development of insurance industry.

Regarding the lowness of output and efficiency of insurance companies in Azerbaijan and lack of development in life insurance and many difficulties that insurance companies are engaged in, the present research and researches about efficiency and yield of insurance companies can serve and guide investors, supervisors, and decision makers on economic macro policies. Since central insurance in Azerbaijan's insurance supervision branch of economical organization as a supervisor, institute directly intervenes on the logic of act of establishments and activities and capitals of insurance companies, the present research can be used as a necessity and urgency. This research will be continued in five sections as follows: 1. Subject literature 2. Methods of efficiency measurement 3. Research methodology

4. Testing and analyzing the assumptions of research
5. Conclusion and proposals.

SUBJECT LITERATURE

Theoretical Foundations of the Research

Using integration and combination of companies and development of activities of companies at international level in order to increase the yield and efficiency have always been considered. Through integration and renewing the structure, try to increase financial power and decrease their costs in order to be active in an optimized manner. Upon encountering the partial Competition conditions and monopoly, what reaction do the companies show themselves and what effect this will have on their efficiency and yield. The present research is to answer this important principle: Enjoying what size and what volume of capitals do commercial insurances in Azerbaijan take the advantage of efficiency and are active at optimized level of scale and if, economical conditions and market capacity will allow this task or not? In addition, whether the share which is more than local market will have more efficiency or not?

Research Background

Cominz Tenison and Weis studied the relationship among integration and ownerships and efficiency and scale savings of life insurances in America during the years 1995-1998. Results from their research showed that companies that have entered in integration and bear large sizes were efficient and enjoyed scale efficiencies [4]. In 2003, David Kamins and Mary Weis evaluated technical efficiencies of America insurances. They studied the companies in three sizes of small, average and large. Results showed that large companies enjoyed more technical efficiencies than small ones [2]. Fan, Van Kapa and Berain (2007) estimated the efficiencies of 14 European countries. They calculated the size and structure of market in terms of efficiency. Their studies showed that during the study period the size of company and local market share were determining factors in efficiency. Larger companies and those with more shares than those of market tended to be deficient [9]. In 2005, Kinka due to a research showed that there was positive and significant relationship between the size of European companies and profitability [10]. In 2005, Bokhari showed that in England large companies are in better situations concerning profitability and yield [1]. In 2006, Lawrence showed that the size of Australian

companies are effective in their efficiencies and yield [10]. In 2011, Hanifezadeh due to a research showed that there was positive and significant relationship between the size of Iranian companies and their efficiency [11].

Concepts and Methods of Measuring the Efficiency

In this research for researching about insurance companies efficiencies in Azerbaijan we have used this method: data envelopment analysis method which is one of the most valid and best methods in efficiency measurement.

Data envelopment analysis Method

Farrell (1957) is among the persons who have worked a lot in the field of efficiency and he has also offered a method to evaluate it, and later this was led to a method named as data envelopment analysis. In his paper (1957) bearing the title "Measuring the Production Efficiency he has defined efficiency of the company as the high ratio of production of an output to the amount of an input". According to this definition, Farrell has also described different kinds of efficiencies as follows [8]: 1. Technical efficiency (offers the efficiency of a company in gaining maximum amount of output from a given set of inputs). 2. Allocative efficiency (was defined as the ratio of economic efficiency to technical efficiency). 3. Economic efficiency (was defined as the ratio of the least possible expense to the existent expense). In order to evaluate the efficiency different methods has been offered by researchers and they may be classified into two groups of:

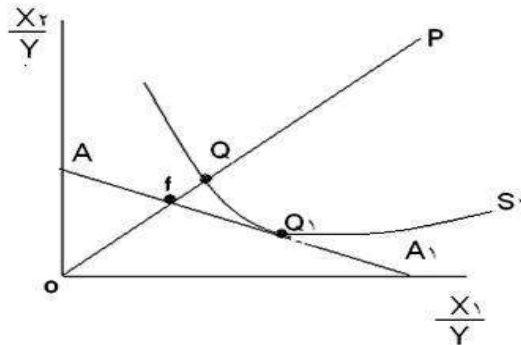
Parametric Methods

Non parametric Methods

Data envelopment analysis Method may be introduced as one of non-parametric methods. In this method, using techniques of linear planning considered units are evaluated. The Paper (CCR) that was published by Charnes, Cooper & Rhodes (1978) in 1978 introduced the DEA (**Data Envelopment Analysis**) method for the first time. This is one of the most important non-parametric methods for measuring the efficiency in which the efficient boundary is experimentally estimated based on available information. In addition, since in attaining the boarder function, all data is given developmentally it is called data envelopment analysis. In order to measure the efficiency by DEA - a computer software named DEAP is used which is based on input for production and

X1 and X2 variables, as well as output Y. Technical efficiency graph in the state of the two (X1 and X2) inputs and an output (Y) is shown in figure one.

Figure 1: Technical Efficiency in the State of Two Inputs and One Output Concerning Z Company



In figure 1 the points located on the curve will offer equality of SS" of technical efficiency if a company uses certain amounts of inputs (specified on point P) to produce an output unit. Technical non-efficiency of the company is shown by distance QP. In percent terms, the ratio QP/OP shows technical efficiency and it can be reduced without reduction in production. According to Farrell's definition, technical efficiency is measured by the ratio $TE=QP/OP$ which is an amount between 0 and 1. In general, technical efficiency (meaning being located on similar production curve (SS')), specialized efficiency (meaning being located on the line of production expense (AA')), and economic efficiency are obtained on the tangent point of similar production curve (SS') and similar line (AA').

INPUTS AND OUTPUTS

In most studies that have been done on efficiency and earnings scale labor force and fixed assets of the companies have been used as inputs, such as Deacon's study (2001), and in some studies more inputs have been used [6]. For example, in their studies, Tone kaoru, saho, & Biresh (2005) have used the business, borrowed capital, labor force, and shareholders' capitals services as outputs. However, in most of the studies labor force and fixed assets have been used as the main inputs [12]. (The present research uses data envelopment analysis method to calculate efficiency and earnings scale of insurance companies). In addition, inputs, assets, shareholders' rights, insurer expenses, and outputs including insurer's earned and investment earned, and added value, which are computed as the following, have been used:

Added value = earned premiums + income due to investment – payable commission – claims and expenses of insurers

RESEARCH METHODOLOGY

From the viewpoint of purposes, this research is an applied one because it has studied the relationships between variables and insurance market and is to state the relations and offer strategies to increase the efficiency of insurance companies in market. This is a descriptive research and enjoys inductive approach and it uses of survey method for collecting and measuring the information on the basis of inputs and outputs data. Also, have been used descriptive methods for describing the model (Data Envelopment Analysis Method) .Its time domain is all of active insurance companies in Azerbaijan at the level of insurance market in the years beginning from 2009- 2010 that have gained activity certificates from the Azerbaijanis' department of insurance supervision .

Model variables

In this research include input and output variables that input variables consist of assets, labor forces and insurer expenses and outputs includes insurers earned and added value.

Research software

In order to measure performance and estimating several numbers of parameters of production has been used from a computer software (DEAP) version2.1 which is provided by Tom Coelli from New England University with fixed output assumption [3].

RESEARCH MODEL

The measurement method of Technical and scale efficiency

In order to measure the performance and estimating the parameter of several number of production function is used mathematical model in phase environment which was completed in 1978 by Charnes, Cooper & Rhodes and became known as the CCR model, the performance assessment index, each decision maker unit is same input and output parameters of model. For each input or output elements must be found several weights till all input and output, converted to a balanced input and output [5].If the number of firms n each of the vectors of input x_i , which includes m inputs to the vector

product (service) r that y contains s product (service) is able to convert. Linear programming to measure the firm

assumption p that will be called the decision maker unit p (DMUP) is as following models:

Min:hp	
n	
S.t: $h p x_i p - \sum_{j=1}^n \lambda_j x_{ij} \geq 0$	$i=1, \dots, m$
$j=1$	
n	
$- Y_{rp} + \sum_{j=1}^n \lambda_j Y_{rj} \geq 0$	
$r=1, \dots, s$	
$j=1$	
$\lambda_i \geq 0$	
n	
assumption. constant	$\sum_{j=1}^n \lambda_j = 1$
	output
	$j=1$
n	
assumption .variable output	$\sum_{j=1}^n \lambda_j = 0$
	$j=1$

In this linear model the amount of aim function is h_p and coefficient of λ_j consider as unknown which can earn the optimum amount by solving the liner programming model.

H_p : is the ratio between input and outputs which are between 0, 1. if the used amount be equal with optimum amount In this way h is equal to one that shows the firm is efficient.

Y_j is output and X_j is a vector which has $k \times 1$ dimension consists of input and λ_j is a vector which has $n \times 1$ dimension consists of fixed numbers.

The evaluation method of economical efficiency

Assume that our data consists of m input and s out put for each one of n companies. the j company ($j=1,2, \dots, n$) from one input vector $m \times 1$ vector $X_i = (X_1, X_2, \dots, X_m)$ use for producing an output vector $Y = (Y_1, Y_2, \dots, Y_s)$ which X is an input matrix $m \times n$ vector and Y is an output matrix of $s \times n$ vector and it shows variable for all n companies as model. In the first stage linear planning will be as follows:

Min: WiXi*	
n	
S.t: $X_i * - \sum_{j=1}^n \lambda_j x_{ij} \geq 0$	$i=1, \dots, m$
$j=1$	
$\lambda_j \geq 0$	
n	
assumption. constant output	$\sum_{j=1}^n \lambda_j = 1$
	$j=1$
n	
assumption. variable output	$\sum_{j=1}^n \lambda_j = 0$
	$j=1$

In this model w_i is the product vector's of cost and X_i^* (which can solve by linear planning) is the product vector's which cause minimizing the firm cost with same price W_i and production limit of Y_i . W_i is an input vector cost m^*1 for j company which is equal with input vector X_i and X_i is the input vector for minimizing the j company, expenses (which solve by linear planning) in the second stage the economic efficiency of j company that is the ratio of the least possible expense to the existent expense would be calculated as:

$$CE = W_i X_i / W_i X_i$$

Efficiency amount is between 0, 1. Economic efficiency with amount 1 shows a company which is efficient in expenses. $1 - CE$ shows the amount of expenses that company can, not to reduce and have the minimum amount of output.

Data Gathering Method:

Data and information gathering has taken place in the library and field forms Statistical universe of the present research are 28 active companies in 2009 and 27 active companies in 2010 years in Azerbaijan at insurance market level, which have been under supervision of Azerbaijanis' Department of insurance supervision. In order to test the theories and analyze them the method of data envelopment analysis and have been used.

Research Assumptions

Concerning increase in yield and efficiency of insurance companies through integration and combination of the companies and regarding the shares of companies from insurance market, two assumptions take place based on the purposes of the research, which are as follows: 1. Insurance companies with large sizes have higher yield and efficiency compared to the insurance companies with small and average. 2. Companies that more shares of market are available for them are more effective than other companies.

Definition of the Main Concepts Used in the Research

Size of the Company

Size of the company is evaluated by different indexes. From among those indexes we can point out to asset values, sale rate and the value of stock markets of

companies and so on. In this research assets of the company have been selected as the base of insurance companies' sizes. Upon obtaining the average value of assets of active insurance companies in insurance market, except for the value of assets of reliance insurance and central insurance, according to their value of assets, insurance companies were classified into three groups of large, average, and small and their efficiencies were calculated using envelopment analysis of data, and financial ratio (shown in tables 1).

Insurance Market

In this research the whole portfolio of commercial insurance companies except for portfolio of reinsurance companies that are considered as insurance market and the share of each company from insurance market has been determined as ratio of company's portfolio to the whole portfolio of market. Considering the statistics and information about the Azerbaijanis' Department of insurance supervision, that have been extracted from financial statements of insurance companies and insurance companies shares of insurance market has been determined during the years from 2009-2010, and regarding that on the basis of their shares of market the calculation of average portfolio of insurance companies have been classified on the basis of their shares of market into three groups (large shares, average shares, and small shares), then their efficiencies were calculated using envelopment analysis methods (shown in tables 2).

Testing the Research Assumptions Using Data envelopment analysis Method in Azerbaijan republic

Based on results from data and information analysis using data envelopment analysis method that has been collected using DEAP software and shown in tables 1 and 2, it became clear that insurance companies with large sizes are more efficient than other companies. In addition, it became clear that companies with more shares than that of market are more efficient than other ones. So, both assumptions of the research: 1. Insurance companies with large sizes enjoy higher efficiency and yield than insurance companies with small and average sizes. 2. Companies with larger shares than that of market are more efficient than other companies are approved.

Table 1: Average Efficiency Comparison of Insurance Companies in 2009-2010 (separately)

1. Insurance companies with large sizes 2. Insurance companies with Average 3. Insurance companies with small sizes

Insurance companies with small sizes			Insurance companies with Average sizes			Insurance companies with large sizes		
Scale Efficiency	Economic Efficiency	Technical Efficiency	Scale Efficiency	Economic Efficiency	Technical Efficiency	Scale Efficiency	Economic Efficiency	Technical Efficiency
.64	.41	.38	.87	.54	.47	.77	.75	.67

Source: research calculation

Table 2: Average Efficiency Comparison of Insurance Companies in 2009-2010 (separately)

1. Insurance companies with large shares of market 2. Insurance companies with Average shares of market 3. Insurance companies with small shares of market

Insurance companies with small shares of market			insurance companies with Average shares of market			insurance companies with large shares of market		
Scale Efficiency	Economic Efficiency	Technical Efficiency	Scale Efficiency	Economic Efficiency	Technical Efficiency	Scale Efficiency	Economic Efficiency	Technical Efficiency
.64	.40	.37	.85	.54	.53	.86	.77	.69

Source: research calculation

The result of research with method of comprehensive analysis of the information in based on first hypothesis and has been shown in the 1 and 2 tables. The constant expenses will decrease with production increase and companies try to obtain the large share of market and decrease production expenses thus the first hypotheses of this research is approved.

Base on the second hypothesis should see low insurance coefficient penetration and less insurance premium and law less share of the insurance market on the base of large number law and being asymmetrical information in the insurance market it caused high damage and less effective. The result of the investigation in Azerbaijan is equal with many investigation held above.

CONCLUSION AND PROPOSALS

According to studies and obtained results from using methods, data envelopment analysis to measure efficiency and yield of insurance companies it was cleared that the efficiency of insurance companies in Azerbaijan is less and at low level. Insurance companies with large sizes and more shares of insurance market enjoy more ability in relation to controlling the expenses and obtaining the maximum outputs compared to inputs, and this result is the same as result from many researches

mentioned above. To increase the efficiency of the companies and controlling and decreasing expenses by companies based on ration output to input we give the following suggestions:

1. Because of less life of insurance companies in Azerbaijan the government must, prepare the framework of more control and supervision of the insurance companies, In addition, use the standards of "international association insurance supervision".

2. Because of efficiency is low and the production of insurance premium is less state must be protect the insurance companies by determine and approving the rule and law of activities of insurance companies and do the affairs about the increasing the capitals of insurance and try to increase the culture of usage from insurance services and encourage the people to use the insurance services.

3. Because of life of insurance companies in Azerbaijan is less and the people have not confidence to insurance companies and drawing the value of damages or claims of them thus the state and insurance supervision must do more efforts about coordination between insurer and insured and development of insurance industry.

4. It is proposed researches to be done on liberalization rate and centralization in insurance market.

5. Required researches to be done on asymmetric information in insurance market. In addition, detailed studies and researches to be done in case of reasons for presence and creating asymmetric information in insurance companies and the mode of eliminating them.

6. Preventing the monopoly and centralization in insurance market through establishing insurance companies with capitals and asset values more than the average value of capital and assets of insurance companies.

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