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EXAMINING THE EFFICIENCY OF INDUSTRIAL PRODUCTION CENTERS OF WEST AZERBAIJAN IN RELATION TO ALLOCATING OPTIMUM PRODUCTION FACILITIES USING DEA AND COMPARATIVE STUDY METHOD (CASE STUDY: WEST AZERBAIJAN INDUSTRIAL ZONES COMPANY)

Masoud Aliyari, Dr. Mehran Molavi[1]
Department of Public Administration, Mahabad Branch, Islamic Azad University, Mahabad, Iran

ABSTRACT
The aim of the present study is to examine the efficiency of industrial production centers of West Azerbaijan in relation to allocating optimum production facilities using DEA and comparative study method (case study: West Azerbaijan Industrial Zones Company). The study is applied and descriptive in terms of goal and data collection, respectively. Each industrial center is considered as a unit decision-maker. In order to make analysis on data, calculations related to the chosen model is done by DEA SOLVER developed software. The results indicated that those centers whose efficiency index was 1 were known to be effective. Beverage, publishing, printing and reproduction, plastic products, non-metallic mineral products, footwear and accessories, chemical products, electronic devices and optical devices, non-metallic mineral products, animal feed, poultry and poultry products were technical stuff.

KEYWORDS: efficiency of industrial centers, optimum allocation of productive facilities, DEA, inputs, outputs

INTRODUCTION

Content and qualitative changes have occurred in global markets during the past two decades. The trend has been toward globalization and localization of markets. Production-oriented status is finished and customer-orientation fashion is led to be formed, industrial manufacturers have offered solutions whose results would be changes in industrial frameworks aiming to have optimum use of facilities and prevention of resources wasting. One of the prominent and main characteristics of such a change is gradual development of small industries. Development of industries is the key to economic development of incoming decade. Penroz has demonstrated the theory of Aeks and Adresh in delivering demand structure and cluster development paradigm saying that all types have indicated the excellence of industries on the way of economic development. Studies have shown that small industries have impacts through four channels i.e. entrepreneurship, innovation and technology change, dynamism of industry and establishing occupational opportunities. In addition, increasing of global competition, increase of uncertainty, and increasing demand of different products have led to the fact that tendency is constructed toward these industries although big industries are highly considered by economic policy maker due to have enjoyed advantages such as huge scale effect, frequency of production effect, and organizational effect. Transpiration effect, market size, setting effect, effectiveness of choosing and control effect are the reasons to why these industries have been changed to the first choice in producing goods.

Effectiveness of industrial centers

A great deal of review has been developed regarding the employment of small sector and this had led to the fact that different definitions are set foot this sector. These definitions are different according to age structure, demographic changes, cultural medications and degree of development (center of commercial studies and researches, 2005, 7). Small and medium size firms across the world are similar; however, one cannot develop a common definition. Every country has defined the business differently. Most of these definitions have been offered based on quantitative criteria such as the number of employers and amount of financial balance, establishing and supporting the industrials centers within the economic development plans indicate the importance of position related to these industries of economy in developed countries. In general, one can contribute the most important role of these industries to effective employment, appropriate management of production chain, establishing added value, and reduction of dependency on imports. Considering the fact that increasing of efficiency having to do with small industries can pave the way for enjoying the

[1] Corresponding author, email: dr_molavi1967@yahoo.com

afore-said attributes, the aim of the present study is to examine and evaluate types of technical efficiency and management-based efficiency across important sectors of industry as well as to offer policy-based recommendations to inefficient industry holders.

Small and medium -sized industries in Iran

Based on the definition offered by Ministry of Mines and Industries and Ministry of Agriculture, small and medium – sized industries are the industry and service providing sectors which involve 50 workers (Yonido, 2004, 121). Minister of Cooperation employers the definition provided by Ministry of Mines and Industries as well as Iran Statistics Department regarding these industries. Iran Statistic Department categorizes the businesses into four groups: business involving 1-9 workers, 10-49 workers, 50-99 workers, and higher than 100 workers. Although this classification is somehow similar to the definitions provided by United Nations, Iran Statists Department regards less than 10 workers involvement in business as small and medium-sized firms and that other business are taken into account as big industrial manufactures. Iran Central Bank views less than 100 workers involvement business as small and medium-sized firms.

Importance of development solutions and improvement small as well as medium-sized industries status in Iran

It seems that Iran can make use of the potential of small a medium-sized industries to achieve its twenty-year targets. To do so, it is essential that a number of modifications are made. Some of the suggested solutions are as follows:

Reduction of petrol dependency

Rationalizing the efficiency in different economic sections

Strengthening

Establishment policy through developing small and medium-sized industries

Establishing competitive context

Calculating efficiency in industries

The technical efficiency index is one of the important evaluation indexes of efficiency for industrial activities. One can make use of technical efficiency criterion to estimate the status of industrial exploitation and intact potentials, as an example in case, this index is 79% for producing boxes and packaging industries. One can say that this efficiency can act under 21% of the optimum potential. Based on the obtained data, there are only 8 industries whose technical efficiency index is greater than 70%. Other remaining industries are under 70% efficiency. Tus, one can conclude that intact and unemployed industries make use of potentials in industry.

One can categorize the reasons of inefficiency as technical issues, legal issues, market structure, management issues, and non-structured issues. The question of what type of industry faces such an inefficiency requires individual investigation of each industry. For instance, the main problems of tea making industry which has the minimum of this index are season-based and storage issues. One can declare that technical issues reflect the efficient unit Iso – quant. This curve includes locus of different compounds of inputs (x1 and x2) employed by firms such as I, J, K for unit of output. Productive sectors such as I, J, K constitute units which are active from technical perspective and other productive sectors such as L and P would behave non-technical. Based on Farel theory, EUI is s standard for determining and measuring allocative efficiency and efficiency of allocative as well as technical efficiency of different productive sectors.

Local studies

Shahrodi *et al.* (2011) measured the efficiency of banks branches using DEA in two levels and conducted it using Bank Saderat data in Gilan province. It was found that 3 branches were effective out of 20 studied branches and other branches were inefficient. Farshadmehr (2011) analyzed 38 Departments of Information Services of Mellat Bank and sub branches using data envelopment analysis. Initially, input or output indexes were identified throughout different processes and the validity and coefficient of indexes were determined using Delphi and fuzzy methods, later, the suggested model for evaluating and prioritizing these departments was extracted through integrating three models of modified Russel model, efficiency evaluation, Anderson-Peterson ranking model, and adding weight limitation. Nasiri Naser (2002) examined the efficiency of 172 branches of Keshavarzi bank using data envelopment analysis method and constant as well as variable efficient hypothesis. The studied branches were categorized based on exclusive attributes such as the field of performance, field of performance, and size of branch and that the amount of the efficiency of units was calculated. The results indicated that the man of technical efficiency of Keshavarzi Bank branches under product efficient of constant and varied status were 0.81 and 0.94, respectively. In case of varied efficiency to scale, the highest

mean of efficiency among rural services branches was 0.98. Also, the constant efficiency to scale among main branches **was 0.84.**

International studies

Fokoiama and Wier (2002) studied changes in Japan Banks during the years 1992-1196 using data envelopment analysis. The number of employers, capital, deposits, and other non-efficient expenses were used as inputs. Also, different types of allocated loans and other investment as well as non-efficient incomes were employed on output.

Paradi and Shaftit (2004) examined 90 branches of Canada Banks. Two models were developed to evaluate performance. The first model, which is named as productive model, is directly dependent on process and physical trend of resources across branches whose results are useful for mangers of branches. Inputs of model were defined as employers, expense of information technology, rent expense, non-efficient expenses. Also, outputs involved deposits, loans, and operational services.

In strategic model input involve different factors and managers have tendency to reud them. Outputs involved excellent criteria to be maximized by bank. Inputs include employers, equipment, non-efficient expenses, non-committed loans and that outputs involved deposits, loans, and wager-based incomes.

Tsolas (2010) developed framework for evaluating the performance of banks branches in productivity and effectiveness using DEA method. The results indicated that one can have a better view to identify productivity and efficiency of bank branches using DEA model. The study emphasized the encouragement importance to increase efficiency and productivity across commercial bank branches.

Research questions

Which industrial production centers of West Azerbaijan are efficient in terms of the input and output data?

What types of efficiency are enjoyed by indusial production centers of West Azerbaijan?

MATERIALS AND METHODS

The study uses survey method. It is applied and descriptive in terms of goal and quality of data collection. Statistician sampling is not done in the study since all industries across country have been divided statistically and the data are categorized individually per year and group. 30 industrial production centers of West Azerbaijan have been chosen as the database centers to collect eh periodical data. Iran National Statistical Portal has been used to study the reported data. It is worth noting that studied data are based in annual cycles during the years 2012-2013.

Analysis of statistical data

Calculations related to chosen model of data envelopment analysis were done using DEA SOLVER developed software. The employed models of this study is CR model. Two fundamental models in data envelopment analysis are CCR and BCC models. The former measures firm efficiency in constant to scale case. The latter estimates firm efficiency in varied efficiency to scale condition. Popularity of CR model is due to the fact that it has been able to resolve the issues of calculating the weights. CR model determines he place of decision-making sectors and what inputs and outputs should be chosen as integrated to achieve the efficient case.

Inferential analysis of statistical data

Efficiency evaluation of centers in 2013

				Input-Oriented CRS		
	Benchmarks	RTS		Efficiency	DMU Name	DMU No.
Food	0.015	Increasing	0.681	0.05090	tobacco	1
Textile production	1.000	Constant	1.000	1.00000	Textile production	2
Food industries	1.000	Constant	1.000	1.00000	Food industries	3
tanning and dressing of leather products	0.089	Decreasing	1.620	0.20616	drinking	4
tanning and dressing of leather products	1.000	Constant	1.000	1.00000	tanning and dressing of leather products	5
plastic products	0.074	Increasing	0.183	0.07926	Cloth production	6
Publishing, printing and reproduction	0.789	Decreasing	2.688	0.17664	paper cloud	7
Publishing, printing and reproduction	0.000	Increasing	0.145	0.08162	Wood production	8
Publishing, printing and reproduction	1.000	Constant	1.000	1.00000	Publishing, printing and reproduction	9
plastic products	1.000	Constant	1.000	1.00000	plastic product	10
Non-metallic mineral products	0.001	Increasing	0.125	0.21967	plastic product	11
Metal products	1.000	Constant	1.000	1.00000	Metal products	12
Appliances	0.159	Decreasing	1.565	0.15051	machines	13
plastic products	0.067	Increasing	0.166	0.22632	minerals	14
Non-metallic mineral products	1.000	Constant	1.000	1.00000	Non-metallic mineral products	15
Motor vehicle	1.000	Constant	1.000	1.00000	Motor vehicle	16
furniture	1.000	Constant	1.000	1.00000	furniture	17
Metal products	0.003	Increasing	0.101	0.16026	Trailers and semi-trailers	18
Shoes and Accessories	1.000	Constant	1.000	1.00000	Shoes and accessories	19
Shoes and Accessories	0.094	Increasing	0.949	0.90921	Cotton and Wicker	20
Publishing, printing and reproduction	0.318	Decreasing	1.185	0.08849	Chemical products	21
Plastic products	0.125	Decreasing	1.153	0.07525	Medical products	22
Publishing, printing and reproduction	0.344	Decreasing	1.428	0.28140	Media recordings	23
Electricity transform	1.000	Constant	1.000	1.00000	Convection	24
accessories	1.000	Constant	1.000	1.00000	accessories	25
accessories	0.548	Decreasing	1.015	0.51277	instrumentation and Optics	26
Non-metallic mineral products	1.000	Constant	1.000	1.00000	Non-metallic mineral products	27
Paltry food	1.000	Constant	1.000	1.00000	Paltry food	28
Paltry food	1.000	Constant	1.000	1.00000	Paltry food	29

Based on the obtained results, those centers whose efficiency index was 1were reported to be efficient. Manufacture of textiles, manufacture of tanning and dressing of leather, publishing, printing and reproduction, plastic products, beverage, non-metallic mineral products, motor vehicles, furniture, cotton and straw, across electric power, livestock and poultry, livestock production and poultry were technically efficiency.

Since all auxiliary variables related to input and output are obtained as zero after solving the equation, these center are regarded as strong or Parto-Copman efficient centers. The above diagram presents the comparison of these centers. The efficiency index of centers which are more efficient compared to other centers tend to 1.
Determining the type of inefficient centers

				Output Slacks				Input Slacks		
WLV	EVA	PAO	PEF	PVA	FUM	ENU	IBM	CUP	DMU Name	DMU No.
32271.92846	0.00000	0.00000	183924.97374	47792.97777	23.22401	1374.62954	0.00000	0.00000	Tobacco	1
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Textile production	2
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Food	3
31705.72128	2350.97526	0.00000	0.00000	69048.80987	0.00000	67414.41596	0.00000	17612.53402	Beverage	4
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	tanning and dressing of leather	5
770.21969	41.94947	55.05582	0.00000	0.00000	116.22781	0.00000	0.00000	0.00000	Garment	6
89563.00823	1260.30030	0.00000	0.00000	0.00000	1714.93877	0.00000	0.00000	0.00000	Production of paper	7
23908.65251	173.38142	0.00000	0.00000	0.00000	230.93279	0.00000	0.00000	0.00000	Wood production	8
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Publishing, printing and reproduction	9
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Plastic products	10
0.00000	16.15407	1488.53984	0.00000	0.00000	0.00000	491.51346	0.00000	52739.08343	Rubber products	11
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Metal products	12
61643.71760	0.00000	0.00000	114203.87493	0.00000	0.00000	4355.81196	848.59388	0.00000	Machines	13
1100.80656	240.20548	0.00000	0.00000	9959.60422	28.53531	0.00000	6859.28581	0.00000	Minerals	14
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Non-metallic mineral products	15
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Motor vehicle	16
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Furniture	17
4953.10349	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	4689.10995	47689.89110	Trailers and semi-trailers	18
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Shoes and Accessories	19
0.00000	0.00000	1192.75749	231175.64669	70397.75964	0.00000	0.00000	0.00000	6061.31982	Cotton and Wicker	20
184614.76151	0.00000	0.00000	0.00000	0.00000	0.00000	17626.00229	0.00000	0.00000	Chemicals	21
20986.55726	3333.45024	429.14110	0.00000	0.00000	0.00000	2099.30527	0.00000	0.00000	Medical products	22
154773.13566	0.00000	0.00000	0.00000	0.00000	0.00000	58952.88525	0.00000	39691.86570	Media recordings	23
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Convection	24
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Appliances	25
13794.40982	0.00000	0.00000	117089.44102	102296.61756	0.00000	343.76779	167949.03517	0.00000	Instrumentation and Optics	26
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Non-metallic mineral products	27
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Livestock and poultry	28
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Production of livestock and poultry	29

These centers are inefficient since θ^*<1 for others. In addition, when it comes to resolving the model, one of the auxiliary input or output variables equals to opposite zero, these centers are inefficiently combined. Regarding the fact that the centers whose auxiliary variables index related to inputs (s_i^-) and outputs (s_r^+) are equal to zero, they are technical and Parto-Copman efficient.

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Evaluating efficiency of centers in 2014

				Input-Oriented CRS Efficiency	DMU Name	DMU No.
Benchmarks		RTS				
Publishing, printing and reproduction	0.534	Decreasing	1.693	0.47270	Tobacco	1
Publishing, printing and reproduction	0.015	Increasing	0.228	0.09693	Textile production	2
Shoes and Accessories	0.524	Increasing	0.617	0.74144	Food	3
Beverage	1.000	Constant	1.000	1.00000	Beverage	4
Non-metallic mineral products	0.005	Decreasing	1.682	0.72834	Of tanning and dressing of leather	5
Appliances	0.035	Increasing	0.128	0.34171	Garment	6
Publishing, printing and reproduction	0.188	Decreasing	2.515	0.34826	Production of paper	7
Shoes and Accessories	0.233	Increasing	0.300	0.30500	Wood production	8
Publishing, printing and reproduction	1.000	Constant	1.000	1.00000	Publishing, printing and reproduction	9
Plastic products	1.000	Constant	1.000	1.00000	Plastic products	10
Shoes and Accessories	0.987	Decreasing	1.394	0.26847	Rubber products	11
Metal products	1.000	Constant	1.000	1.00000	Metal products	12
Shoes and Accessories	1.960	Decreasing	2.973	0.23057	Machines	13
Beverage	0.003	Increasing	0.174	0.12466	Minerals	14
Non-metallic mineral products	1.000	Constant	1.000	1.00000	Non-metallic mineral products	15
Non-metallic mineral products	0.000	Increasing	0.297	0.83952	Motor vehicle	16
Publishing, printing and reproduction	4.174	Decreasing	7.591	0.39720	Furniture	17
Beverage	0.017	Increasing	0.585	0.57452	Trailers and semi-trailers	18
Shoes and Accessories	1.000	Constant	1.000	1.00000	Shoes and Accessories	19
Non-metallic mineral products	0.002	Increasing	0.162	0.83248	Cotton and Wicker	20
Chemicals	1.000	Constant	1.000	1.00000	Chemicals	21
Shoes and Accessories	4.179	Decreasing	7.281	0.91573	Medical products	22
Non-metallic mineral products	0.002	Decreasing	4.153	0.86706	Media recordings	23
Non-metallic mineral products	1.358	Decreasing	5.854	0.94005	Convection	24
Appliances	1.000	Constant	1.000	1.00000	Appliances	25
Instrumentation and Optics	1.000	Constant	1.000	1.00000	Instrumentation and Optics	26
Non-metallic mineral products	1.000	Constant	1.000	1.00000	Non-metallic mineral products	27
Livestock and poultry	1.000	Constant	1.000	1.00000	Livestock and poultry	28
Livestock and poultry	1.000	Constant	1.000	1.00000	Production of livestock and poultry	29

Based on the obtained results, those centers whose efficiency index was 1were reported to be efficient. Beverage, publishing, printing and reproduction, plastic products, non-metallic mineral products, footwear and accessories, chemical products, electronic devices and optical devices, non-metallic mineral products, animal feed, poultry and poultry products were technically efficiency.

Since all auxiliary variables related to input and output are obtained as zero after solving the equation, these center are regarded as strong or Parto-Copman efficient centers. The above diagram presents the comparison of these centers. The efficiency index of centers which are more efficient compared to other centers tend to 1.

Determining the type of inefficient centers

				Output Slacks				Input Slacks		
WLV	EVA	PAO	PEF	PVA	FUM	ENU	IBM	CUP	DMU Name	DMU No.
113265.57229	0.00000	0.00000	147588.97874	0.00000	0.00000	22012.79530	0.00000	0.00000	Tobacco	1
7533.60380	0.00000	0.00000	0.00000	0.00000	504.49980	1284.74460	0.00000	0.00000	Manufacture of textiles	2
23999.16414	82.49245	809.94274	0.00000	858.61358	0.00000	14777.81756	0.00000	50790.23543	Food industry	3
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Beverage	4
129024.22011	0.00000	3795.86194	0.00000	0.00000	0.00000	93884.59404	0.00000	133547.17195	Of tanning and dressing of leather	5
7295.94413	34.93250	258.23975	0.00000	0.00000	510.83598	3995.91489	0.00000	0.00000	Clothing	6
267323.06914	0.00000	0.00000	91714.75573	0.00000	2128.65035	36400.30937	0.00000	0.00000	Production of paper	7
17297.57745	324.23313	584.70048	0.00000	0.00000	207.21442	3442.00761	0.00000	0.00000	Wood production	8
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Publishing, printing and reproduction	9
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Plastic Products	10
0.00000	1125.13604	2876.30998	73699.32624	0.00000	282.20127	4678.00507	0.00000	0.00000	Rubber products	11
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Metal products	12
190483.02228	2253.72014	196.61938	0.00000	0.00000	21.86515	1440.45508	0.00000	0.00000	Machines	13
22369.98203	0.00000	523.99292	0.00000	0.00000	0.00000	0.00000	2533.44655	0.00000	Minerals	14
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Non-metallic mineral products	15
18730.00415	0.00000	838.09721	0.00000	0.00000	0.00000	2502.09815	0.00000	27082.62351	Motor vehicle	16
233016.61593	0.00000	0.00000	0.00000	222967.91079	3756.78831	68651.12145	0.00000	0.00000	Furniture	17
56554.12248	96.30009	4249.09867	0.00000	0.00000	0.00000	0.00000	1517.27931	0.00000	Trailers and semi-trailers	18
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Shoes and Accessories	19
0.00000	0.00000	588.75400	6472.94036	0.00000	515.69606	65.26884	3341.09021	0.00000	Cotton and Wicker	20
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Chemicals	21
543131.64822	6277.22159	18029.47812	0.00000	0.00000	0.00000	50025.90009	0.00000	453538.57012	Medical products	22
405400.06681	0.00000	13732.18330	0.00000	0.00000	6696.56247	310622.80834	7591.37386	0.00000	Media recordings	23
623031.54467	3788.87380	47125.36429	0.00000	0.00000	4282.23945	363531.34461	71519.13019	0.00000	Convection	24
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Appliances	25
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Instrumentation and Optics	26
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Non-metallic mineral products	27
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Livestock and poultry	28
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	Livestock and poultry	29

These centers are inefficient since θ^*<1 is for others. In addition, when it comes to resolving the model, one of the auxiliary input or output variables equals to opposite zero, these centers are inefficiently combined. Regarding the fact that the centers whose auxiliary variables index related to inputs(s_i^-) and outputs (s_r^+) are equal to zero, they are technical and Parto-Copman efficient.

CONCLUSION AND DISCUSSION

Based on the results obtained from Iran Statistics Department (2006), the production of textiles, wood products, publishing and printing and copying, publishing, printing and reproduction, plastic products, rubber products, minerals, shoes and accessories, medical products, electronic devices and optical devices, non-metallic mineral products, livestock and poultry and the production of livestock and poultry were technically efficient. Based on the results

obtained from Iran Statistics Department (2007), efficient centers were the ones enjoying index 1 in relation to efficiency. Tobacco, beverage, leather and leather products, rubber products, metal products, furniture, trailers and semi-trailers, shoes and accessories, non-metallic mineral products, livestock and poultry, livestock and poultry products were technically efficient.

Based on the results obtained from Iran Statistics Department (2009), efficient centers were the ones enjoying index 1 in relation to efficiency. Beverage, food, tanning and dressing of leather products, non-metallic mineral products, trailers and semi-trailers, shoes and accessories, metal products, trailers and semi-trailers, shoes and accessories, non-metallic mineral products, electrical appliances, instrumentation and optics, livestock and poultry, livestock and poultry production were technically efficient. Based on the results obtained from Iran Statistics Department (2010), efficient centers were the ones enjoying index 1 in relation to efficiency. Tobacco, beverage, motor vehicles, trailers and semi-trailers, shoes and accessories, cotton and bamboo materials, chemical products, medical products, recorded media, non-metallic mineral products, trailers and semi-trailers, shoes and accessories, products metals, livestock and poultry, livestock and poultry production were technically efficient. Based on the results obtained from Iran Statistics Department (2012), efficient centers were the ones enjoying index 1 in relation to efficiency. Manufacture of textiles, manufacture of tanning and dressing of leather, publishing, printing and reproduction, plastic products, beverage, non-metallic mineral products, motor vehicles, furniture, cotton and straw, transforming electric power, livestock and poultry were technically efficient. Based on the results obtained from Iran Statistics Department (2013), efficient centers were the ones enjoying index 1 in relation to efficiency. Beverage, publishing, printing and reproduction, plastic products, non-metallic mineral products, footwear and accessories, chemical products, electronic devices and optical devices, non-metallic mineral products, animal feed, poultry and poultry products were technically efficient.

SUGGESTIONS

Exploring the industries in line with energy consumption and its optimization regarding the fact that it was found in research data that most companies and industrial centers should be considered in terms of energy consumption.
Incomes and wages indicate companies' capabilities in line with investing on industrial centers. Considering expenses and that exploitation can give rise to efficiency are important to note.
General speaking, the centers which have been mostly invested should be more efficiency while the results of the study do not represent this finding. Someone should modify the employed capital or theses resources are allocated based on their efficiency.
Productivity index indicates that relationship between resources and outputs of companies. Some one should consider the index across companies.
Raw materials depict the usage of initial and natural resources. Hence, one should take into account the quality of using.

REFERENCES

Anvari Rostami A. and Sabor A. (2009). Evaluating the efficiency of manufacturing sectors in cement industry: data envelopment analysis approach. MA thesis, Tarbiat Modares, Tehran
Azar A. and Rajabzade A. (2010). Applied decision-making of MADM approach. Tehran: Negahe Danesh publications.
Chang D. Y. (1996). Applications of the extent analysis method on fuzzy AHP. *Europ. J. of Operat. Res.*, 95, 649-655.
Chang Y.H., Cheng C.H. and Wang T.C. (2003). Performance evaluation of international airports in the region of East Asia. *Proc. Eastern Asia society for transportation studies*, vol.4, and pp.213-230.122.
Cheng C. H., Yang,K. L. and Hwang,C. L. (1999). Evaluating attack helicopters by AHP based on linguistic variable weight. *Europ. J. of Operat. Res*, 16(2), 423-435.
Chou T. Y. and Liang, G. S. (2001). Application of a fuzzy multi-criteria decision making model for shipping company performance evaluation. *Mari. Poli. Manag*. 28(4), 375-392.
Etemadi H., Ahmadzade H. (2007). Examining the cases of not using balanced evaluation system in assessing performance of admitted companies in Tehran Stock Exchange. MA thesis, faculty of economic and capitals affairs.
Namazi M. and Ramezani A. (2003). Balanced evaluation of management accounting. *J. of Hum. Aso. Sci*. Shiraz University, 2.
Namazi M. and Khajavi Sh.. (2003). Efficiency of accounting variables in receiving systematic risk of admitted companies to Tehran Stock Exchange. Studies of Accounting and Auditing, 11 (38).

