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# Factors Affecting Economic Efficiency of Sheep Fattening Industries in Fars Province, Iran

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## ABSTRACT

*Globally Iran occupies the 4th rank in terms of sheep heads with 54 million [1]. Sheep fattening units have played a prominent role in the development of red meat and wool industry in Iranian animal husbandry sector. The present study aims to estimate technical, allocative and economic efficiencies of the sheep fattening units by Data Envelopment Analysis (DEA) technique. Moreover, the effects of various socio-economic factors on levels of the efficiencies of the units were studied. By filling out 285 questionnaires at randomized two-stage cluster sampling and from interviews with the sheep fattener, necessary information was obtained from three regions (cold, temperate and warm) in Iran in 2006/7. The results of this research revealed that the average technical, allocative and economic efficiencies for sheep fattening units were 90.5%, 68.9% and 62.5% respectively. There is a considerable gap about 30-48% between the economic efficiency mean and the best efficient unit in regions of survey. Moreover, increasing of education levels, unit size, number of fattening per year and credits can improve efficiency of sheep fattening industries.*

**Keyword:** Sheep fattening, allocative efficiency, economic efficiency, DEA, Iran

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## INTRODUCTION

The global total of sheep heads is 1079 million according to 2009 statistics of FAO. According to the source, globally Iran occupies the 4th rank in terms of sheep heads with 54 million. Livestock numbers for Iran for 2007 were: sheep 54,000,000; goats 26,500,000; cattle 8,800,000; camels 146,000; buffalo 550,000 [1].

**Table 1. The main producer of sheep in the world 2007 (million heads)**

| Rank | Country | Number | Percent | Rank | Country | Number | Percent |
|---|---|---|---|---|---|---|---|
| 1 | China | 171 | 15.85 | 9 | Pakistan | 24.9 | 2.31 |
| 2 | Australia | 103 | 9.54 | 10 | Nigeria | 23 | 2.13 |
| 3 | India | 63 | 5.84 | 11 | Spain | 23 | 2.13 |
| 4 | Iran | 54 | 5.00 | 12 | Algeria | 19 | 1.76 |
| 5 | Sudan | 48 | 4.45 | 13 | Morocco | 17.02 | 1.58 |
| 6 | New Zealand | 40 | 3.71 | 14 | Ethiopia | 17 | 1.58 |
| 7 | UK | 35 | 3.24 | | Others | 415.88 | 38.54 |
| 8 | Turkey | 25.2 | 2.33 | | **Total** | **1079** | **100** |

***Source:*** *FAO, 2009*

Meat of sheep (mutton) is the most important red meat in Iran. Basically, there are three types of sheep raising in Iran including moveable type by tribal nomads, immoveable type by villagers and fattening of lamb type by stockmen. Both meat and wool can be produced by fattening industries in Iran. Thus, sheep fattening units have played a prominent role in the development of red meat and wool industry in Iranian animal husbandry sector.

Population increase, lack of mutton and increasing of its price has caused the ministry of agriculture in Iran decide to program for request red meat in Iran. Whereas, Iran's drought during recent years and pastures limitation, there is not way except development and improvement of sheep and goat fattening industries.

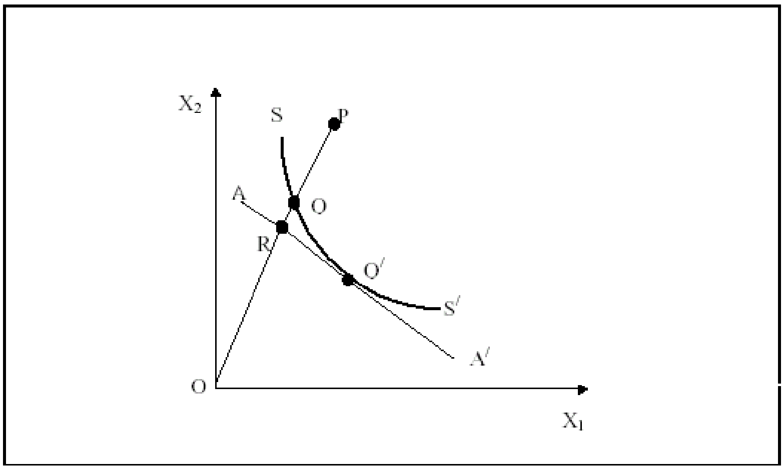
The present study aims to estimate technical, allocative, and economic efficiencies (TE, AE and EE) of the sheep fattening units by Data Envelopment Analysis (DEA) technique. Moreover, we want to know whether has effected socio economics factors on levels of the efficiencies of the units or not. The DEA, occasionally called frontier analysis, is a linear programming-based technique for evaluating the performance of administrative units [2]. Examples of such decision making units ($DMU_s$) to which DEA has been applied include banks, energy firms, agriculture farms, hospitals, tax offices, defense bases, insurance companies, schools, libraries and university departments. The method can successfully be applied to profit and non-profit making organizations, as well. DEA can handle multiple inputs and multiple outputs as opposed to other techniques such as ratio analysis or regression. From the point of view of present study, it is useful to know that very few studies have been carried out in the animal husbandry sector as reported. In order to we can mention to the studies about diary industries [3,4,5], broiler industry [6], goat production [7], pig farming [8,9], and fishery industry [10,11]. Those studies have applied DEA method for estimation of technical efficiency of the DMUs measured generally in terms of economic efficiency (composed of technical and allocative efficiency). This study makes an attempt to measure technical efficiency (TE), allocative efficiency (AE) and cost efficiency or economic efficiency (EE) of the sheep fattening industry by covering many multi-input and multi-output fattening units.

## MATERIALS AND METHODS

### Efficiency concepts

The concept of technical efficiency refers to the ability of a firm or a decision making unit (DMU) to attain maximum output from a given set of inputs, whereas, the allocative efficiency stands for the ability of a firm to use a given set of inputs in optimal proportion given their respective prices. Combining these two efficiency concepts would give a measure of total economic efficiency [12,13]. Farrell (1957) illustrated his definition of three efficiency measures; technical efficiency, price (allocative) efficiency and overall (cost) efficiency, by using a unit isoquant portrayed in the input coefficient space. He used a two-input and single-output constant returns-to-scale example to demonstrate his ideas [14]. In Figure 1, two inputs, $X_1$ and $X_2$, are represented on the horizontal and vertical axes, respectively. $SS'$ is an isoquant representing various combinations of inputs ($X_1$ and $X_2$) used to produce a certain quantity of output (Y).

**Figure 1: Technical, allocative and economic efficiencies in input-oriented measures**




All points on this isoquant reflect technically efficient production. An effort is made to measure the efficiency of a particular firm, which is operating at a point P. At this point (P), the particular firm produces the same level of output (Y) as produced on isoquant, $SS'$. To define the technical efficiency of the observed firm, a line is drawn from the origin to the point P. This line crosses the isoquant at the point Q.

In the case of a technically efficient firm, the same amount of output (Y) is produced using inputs ($X_1$ and $X_2$) defined by the point Q. Inputs are not used efficiently by observed firm P. So the technical efficiency of the observed firm is defined as the ratio of the distance from the point Q to the origin, over the distance of the point P from the origin:

TE = OQ/OP (1)

If the input prices are available, allocative efficiency could also be defined. An isocost line, AA$^{/}$, is drawn tangential to the isoquant, $SS'$, at the point $Q'$, which intersects the line OP at the point R. For the output quantity produced at the point Q, the best use of inputs is at the point $Q'$ because it incurs the minimum cost. Therefore, the point Q is not an optimal point because the distance, RQ (cost), can be reduced without any reduction in output. Allocative efficiency is defined as the ratio of the distance of the point R to the origin over the distance of the point Q from the origin:

AE = OR/OQ (2)

Economic efficiency is the product of technical efficiency and allocative efficiency:

EE = (OQ/OP)(OR/OQ) = OR/OP (3)

Technical, allocative and economic efficiencies are calculated using DEA methods. Technical efficiency is calculated using the input-oriented variable returns to scale (VRS) DEA model. The VRS model is discussed below. This is followed by a discussion of the DEA-Cost model. The exposition which follows is based upon Coelli, *et al.* (1998) [15].

**Data Envelopment Analysis (DEA) Method**

Data envelopment analysis (DEA) is a non-parametric linear programming technique for measuring technical efficiency of a multiple-input-multiple-output DMU [12]. Suppose we have a set of n decision making units, $j=1, \dots, n$. For each unit, there are s outputs, $r=1,\dots, s$ and m inputs, $i = 1,\dots, m$. Let $y_{rj}$ ($x_{ij}$) be the $r$th ($i$th) know output (input) of unit $j$. $h_j = \sum_{r=1}^{s} u_r y_{rj} \Big/ \sum_{i=1}^{m} v_r x_{rj}$ , where $u_r \ge 0$ , $v_r \ge 0$ are unknown variables. The DEA relative efficiency measure $h_{j0}$ for a target decision making unit $j_0$ can be determined by solving the following famous CCR developed by Charnes, *et al.* (1978) [2].

$$
\begin{aligned}
\max \quad & \sum_{r=1}^{s} u_r y_{rj_o} \Big/ \sum_{i=1}^{m} v_i x_{ij_o} \\
\text{s.t.} \quad & \sum_{r=1}^{s} u_r y_{rj} \Big/ \sum_{i=1}^{m} v_i x_{ij} \le 1 \\
& u_r \ge 0 \ , \ v_i \ge 0 \ , \ j = 1,2,\dots,n \\
& r = 1,\dots,s \ , \ i = 1,\dots,m
\end{aligned}
\qquad (4)
$$

The aim of DEA is to quantify the distance to the efficient frontier for every decision making units (DMU). The measure of performance is expressed in the form of efficiency score. After the evaluation of the relative efficiency of the present set of units, the analysis shows how inputs and outputs have to be changed in order to maximize the efficiency of the target DMU. DEA suggest the benchmark for each inefficient DMU at the level of its individual mix of inputs and outputs. The technical, allocative and economic efficiency measurement in these models are illustrated below [13].

**Technical Efficiency Measurement**

Suppose data are available on K inputs and M outputs in each of N firms. Input and output vectors are represented by the vectors, Xi and Yi, respectively, for the i-th. The data for all firms may be denoted by the K×N input matrix (X) and the M×N output matrix (Y). The envelopment form of the input-oriented VRS DEA model is specified as follows:

$$
\begin{aligned}
&\text{Maximize}_{\theta,\lambda} \quad \theta \\
&\text{Subjective to: } -y_i + Y\lambda \geq 0 \\
&\qquad \theta x_i - X'\lambda \geq 0 \\
&\qquad N1'\lambda \leq 1 \quad , \quad \lambda \geq 0 \qquad (5)
\end{aligned}
$$

Where $\theta$ is the input technical efficiency measure having a value $0 \leq \theta \leq 1$. If the $\theta$ score is equal to one, it indicates that the firm is on the frontier. The vector $\lambda$ is an $N \times 1$ vector of weights which defines the linear combination of the peers of the i-th firm. The linear programming problem needs to be solved N times, providing a value of $\theta$ for each firm in the sample. The CRS linear programming problem can easily be modified to account for VRS by adding the convexity constraint $N1'\lambda=1$ (where N1 is an $N \times 1$ vector of ones) to equation 5.

**Economic Efficiency Measurement**

The cost-minimising vector of input quantities for the *i*th firm is calculated using the cost minimisation DEA model. The model is specified below.

$$
\begin{aligned}
&\text{Minimize}_{\lambda, x_i} \quad w_i' x_i^* \\
&\text{Subjective to: } -y_i + Y\lambda \geq 0 \\
&\qquad x_i^* - X\lambda \geq 0 \\
&\qquad N1'\lambda = 1 \quad , \quad \lambda \geq 0 \qquad (6)
\end{aligned}
$$

where wi is a vector of input prices for the i-th firm and $x_i^*$ is the cost-minimizing vector of input quantities for the i-th firm. Economic efficiency is calculated by dividing minimum cost by observed cost.
Economic efficiency = minimum cost/observed cost

or $$EE_i = w_i' x_i^* / w_i x_i \qquad (7)$$

**Allocative Efficiency Measurement**

Allocative efficiency is calculated by dividing economic efficiency by technical efficiency.
Allocative efficiency = economic efficiency/technical efficiency

or $$AE = EE/TE \qquad (8)$$

where TE is the $\theta$ obtained from equation 5. Efficiency scores are obtained using the computer program, DEAP Version 2.1, described in Coelli (1996) [12]. The DEAP program used for these data was set to use variable return to scale (VRS) instead of constant return to scale (CRS).

CRS assumes that all units are operating at an optimal scale. In our data, not all units were operating at the optimal scale and use of CRS would result in technical efficiencies confounded by scale efficiencies. We used VRS to permit the calculation of technical efficiencies devoid of scale efficiency effects. VRS draws a complex hull around the data and always gives equal or higher technical efficiency scores as CRS [12].

**Data and data source**

The data used in this study were obtained from cross-section of sample of lamb fattening population in the year 2006/7. Primary data were collected from sheep fattening industries in Fars province through interviews and questionnaires. Information was collected on outputs and inputs by filling out 285 questionnaires at randomized two-stage cluster sampling and from interviews with the sheep raiser, necessary information was obtained from three regions (cold, temperate and warm) of the province in the period from 2006/7. Two outputs and four inputs variables are used in analytical models. The outputs were fattened sheep meat and wool quantity and inputs were the number of lambs, dry fodder, barley, other foodstuffs (agriculture residue, opoponax tree, sugar beet refuse, dry bread and other), labor and sanitary costs.

The current price mean of outputs and inputs obtained from questionnaires. Moreover, factor affecting economic efficiency were investigated for socio-economic factors such as education, age, fattening size, lamb weight, number of fattening in year and credit by analysis of variance (ANOVA) method [15].

## RESULTS AND DISCUSSION

In this section, the measures of technical, allocative and economic efficiency obtained using VRS DEA and cost minimization DEA models are discussed. Frequency distribution and the technical, allocative and economic efficiency scores of the lamb fattening units for three regions (cold, temperate and warm) of the province are reported in Table 2.

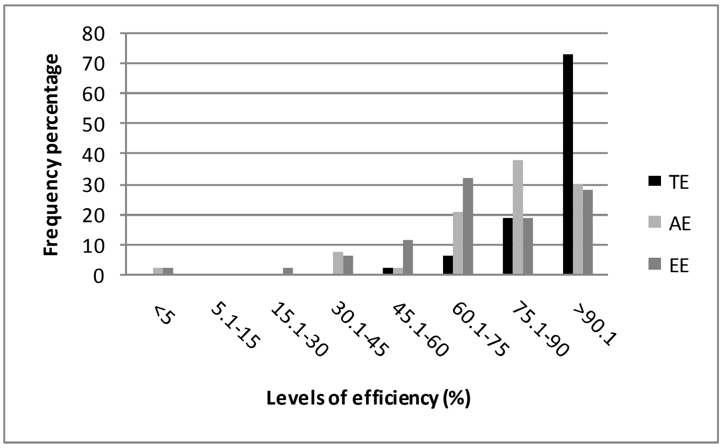
**Table 2: Frequency distribution of TE, AE and EE of three region (cold, temperate and warm) in Fars Province, Iran**

| Efficiency levels (%) | Frequency Percentage | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cold Region | | | Temperate Region | | | Warm Region | | |
| | TE | AE | EE | TE | AE | EE | TE | AE | EE |
| <5 | 0 | 1.9 | 1.9 | 0 | 19.4 | 19.4 | 0 | 1 | 1 |
| 5.1-15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15.1-30 | 0 | 0 | 1.9 | 0 | 0 | 0.7 | 0 | 0 | 2 |
| 30.1-45 | 0 | 7.5 | 5.7 | 0 | 2.2 | 5.2 | 0 | 7.1 | 7.1 |
| 45.1-60 | 1.9 | 1.9 | 11.3 | 0.7 | 10.4 | 23.9 | 2 | 10.2 | 18.4 |
| 60.1-75 | 5.7 | 20.8 | 32.1 | 15.7 | 29.9 | 32.1 | 9.2 | 18.4 | 30.6 |
| 75.1-90 | 18.9 | 37.7 | 18.9 | 28.4 | 29.9 | 12.7 | 23.5 | 37.8 | 20.4 |
| >90.1 | 73.6 | 30.2 | 28.3 | 55.2 | 8.2 | 6 | 65.3 | 25.5 | 20.4 |
| Mean | 93.1 | 79 | 73.6 | 88.7 | 59.0 | 52.3 | 91.6 | 76.9 | 70.6 |
| S.D. | 10.8 | 20.6 | 21.9 | 12.5 | 31.7 | 29.3 | 11.5 | 18.6 | 20.1 |
| Minimum | 50.1 | 0 | 0 | 54.8 | 0 | 0 | 53.7 | 0 | 0 |
| Maximum | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Range | 49.9 | 100 | 100 | 45.2 | 100 | 100 | 46.3 | 100 | 100 |

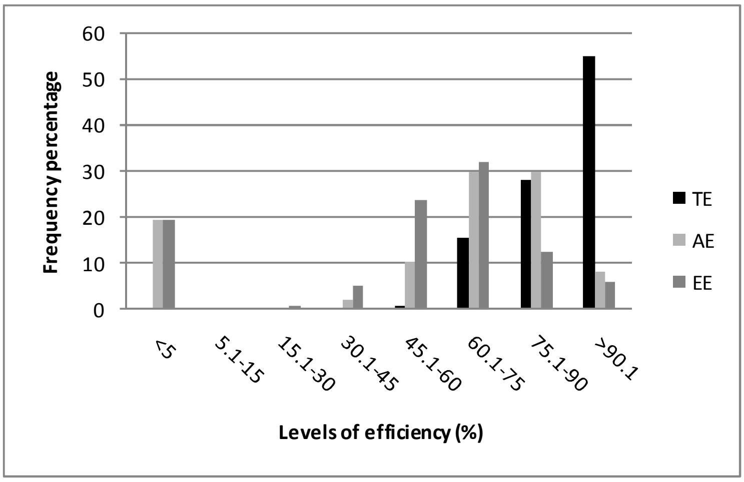
***Source:*** *The research findings*

**Figure 2: Distribution of TE, AE and EE in cold region in panel (a), temperate region in panel (b) and warm region in panel (c).**

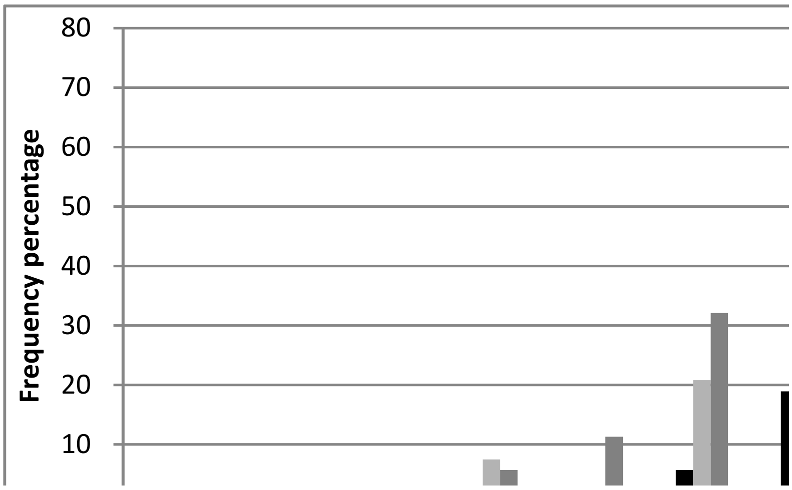
Panel (a)




Panel (b)



Panel (c)




At the cold region of province, the mean values of technical, allocative and economic efficiency are 93.1, 79.0 and 73.6, respectively. At the temperate region of province, the mean values of technical, allocative and economic efficiency are 88.7, 59.0 and 52.3, respectively. Finally, at the warm region of province, the mean values of TE, AE and EE are 91.6, 76.9 and 70.6, respectively. These results suggest that there is significant scope to increase efficiency levels in the lamb fattening units. Namely, the gap between the economic efficiency mean and the best efficient unit is about 30-48% in different regions of Fars province. Also, we can show distribution of TE, AE and EE by graph (Figure 2)

In the other part of research, the effects of various socio-economic factors of stockman on different levels of the all types of efficiencies (TE, AE and EE) were studied. The data were analyzed with analysis of variance, namely (F-test) and t-test. The results are presented in Tables 3 and 4. On the basis of this table, determined that there was not significant difference between education levels for economic and allocative efficiency (P<0.05) except for technical efficiency at the cold region of the province (P<0.1). Also, there was not significant difference between the ages of stockman for all types of efficiency. The findings of investigation indicated a positive effect and significant between fattening size (number of fattened lamb) and all types of efficiency in the different of regions of the province.

The results also revealed a positive effect and significant between number of fattening per year for allocative and economic efficiency amount in the warm region (P<0.05) and there is negative effect and significant between it for technical efficiency in the temperate region (P<0.1). Moreover, the findings indicated a negative effect and significant between bought lamb weight and allocative efficiency and economic efficiency in the cold and temperate regions (P<0.05).

Finally, influence of bank credits in allocative and economic efficiency were positive and significant in cold region of the province (P<0.05). Consequently, increasing of the education level, fattening size, number of fattening period in year and credits will be cause increasing of the economic efficiency or another efficiency component and increasing of bought lamb weight will be cause decreasing the economic efficiency or efficiency component of the sheep fattening in Iran (Table 3 , 4).

**Table 3: Factor affecting TE, AE and EE of sheep fattening in three region in Fars in Iran.**

| Factors | Regions of Survey | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cold | | | Temperate | | | Warm | | |
| | TE | AE | EE | TE | AE | EE | TE | AE | EE |
| Fattener education level | $\uparrow^{*}$ | | | | | | | | |
| Age of fattener | | | | | | | | | |
| Fattening unit size | $\uparrow^{**}$ | | $\uparrow^{*}$ | | $\uparrow^{***}$ | $\uparrow^{**}$ | $\uparrow^{***}$ | | |
| Lamb weight | | $\downarrow^{**}$ | $\downarrow^{***}$ | | $\downarrow^{***}$ | $\downarrow^{**}$ | | | |
| Number of fattening in year | | | | $\downarrow^{*}$ | | | | $\uparrow^{***}$ | $\uparrow^{***}$ |
| Credit receiver | | $\uparrow^{***}$ | $\uparrow^{**}$ | | | | | | |

***Note:*** *signs of ↑ and ↓ mean increasing and decreasing effect respectively and (*), (**), (***) denote levels of significance at 10, 5 and 1 percent respectively.*

**Table 4: Effects of various socio-economic factors on different levels of the all types of efficiencies of the sheep fattening in three regions (cold, temperate and warm) in Fars in Iran**

| Variable levels | Mean of Efficiency | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cold Region | | | | Temperate Region | | | | Warm Region | | | |
| | n | TE | AE | EE | n | TE | AE | EE | n | TE | AE | EE |
| **Education levels** | | | | | | | | | | | | |
| Illiteracy | 10 | 93.7 | 78.9 | 74.4 | 44 | 89.1 | 59.9 | 53.8 | 39 | 92.9 | 77.0 | 71.4 |
| Primary school | 25 | 92.5 | 75.7 | 70.1 | 61 | 90.3 | 57.1 | 51.4 | 30 | 92.2 | 79.5 | 73.9 |
| Guide school | 5 | 83.2 | 86.7 | 70.1 | 20 | 84.3 | 60.3 | 51.5 | 13 | 89.1 | 71.1 | 63.4 |
| High school | 10 | 97.7 | 82.6 | 80.6 | 8 | 86.4 | 62.2 | 53.2 | 15 | 86.6 | 75.2 | 66.2 |
| Upper diploma | 3 | 97.1 | 82.3 | 80.4 | 0 | - | - | - | 1 | 100 | 100 | 100 |
| F-value | - | $1.73^{*}$ | 0.40 | 0.48 | - | 1.24 | 0.11 | 0.06 | - | 0.69 | 0.87 | 1.37 |
| **Age of stockman** | | | | | | | | | | | | |
| <25 year | 5 | 88.0 | 84.5 | 74.4 | 9 | 89.4 | 52.2 | 47.2 | 9 | 91.7 | 76.0 | 69.1 |
| 26-40 year | 21 | 92.9 | 80.4 | 74.5 | 55 | 89.9 | 54.2 | 48.5 | 39 | 89.8 | 75.9 | 68.5 |
| 41-55 year | 15 | 93.5 | 78.8 | 73.9 | 39 | 84.9 | 60.7 | 51.9 | 37 | 92.1 | 78.8 | 72.8 |
| >56 year | 11 | 94.3 | 72.2 | 68.6 | 30 | 90.6 | 66.9 | 60.5 | 13 | 95.6 | 75.3 | 71.5 |
| F-value | - | 0.39 | 0.53 | 0.18 | - | 1.58 | 1.22 | 1.18 | - | 0.83 | 0.19 | 0.30 |
| **Fattening unit size** | | | | | | | | | | | | |
| <40 head | 5 | 100 | 73.0 | 73.0 | 20 | 93.9 | 44.3 | 41.9 | 12 | 99.3 | 73.9 | 73.6 |
| 41-100 head | 27 | 90.8 | 77.2 | 70.3 | 75 | 88.4 | 56.8 | 50.6 | 58 | 88.3 | 77.0 | 67.9 |
| 101-300 head | 14 | 91.6 | 78.4 | 71.1 | 33 | 86.2 | 68.7 | 59.0 | 25 | 95.3 | 76.2 | 72.6 |
| >301 head | 7 | 100 | 91.5 | 91.5 | 6 | 88.6 | 81.8 | 72.3 | 3 | 100 | 92.6 | 92.6 |
| F-value | - | $2.28^{**}$ | 1.07 | $1.90^{*}$ | - | 1.62 | $3.83^{***}$ | $2.52^{**}$ | - | $5.81^{***}$ | 0.82 | 1.73 |
| **Lamb weight** | | | | | | | | | | | | |
| <15 kg | 6 | 87.1 | 71.1 | 59.2 | 13 | 69.2 | 64.5 | 46.3 | 9 | 74.1 | 57.5 | 41.8 |
| 15-25 kg | 26 | 83.9 | 77.7 | 65.9 | 50 | 68.2 | 57.7 | 38.9 | 51 | 72.4 | 51.6 | 37.9 |
| >25 kg | 21 | 73.5 | 60.4 | 43.4 | 71 | 70.7 | 45.1 | 31.1 | 38 | 73.1 | 60.7 | 45.8 |
| F-value | - | 1.55 | $3.23^{**}$ | $4.49^{***}$ | - | 0.15 | $6.17^{***}$ | $3.44^{**}$ | - | 0.02 | 1.63 | 1.22 |
| **No. of fattening per year** | | | | | | | | | | | | |
| One period | 33 | 93.9 | 80.7 | 75.8 | 66 | 90.1 | 58.3 | 52.8 | 68 | 92.4 | 79.3 | 73.6 |
| Two period | 16 | 89.5 | 75.5 | 67.5 | 35 | 84.6 | 58.7 | 49.9 | 18 | 90.0 | 64.4 | 57.5 |
| Three period | 0 | - | - | - | 18 | 87.2 | 53.4 | 44.7 | 3 | 95.7 | 88.1 | 84.6 |
| F-value | - | 1.72 | 0.64 | 1.50 | - | $2.17^{*}$ | 0.17 | 0.51 | - | 0.480 | $5.46^{***}$ | $5.46^{***}$ |
| **Credit receiver** | | | | | | | | | | | | |
| No | 29 | 92.6 | 73.2 | 67.8 | 98 | 89.6 | 56.9 | 52.2 | 73 | 91.8 | 76.9 | 70.5 |
| Yes | 24 | 93.6 | 86.0 | 80.5 | 32 | 87.6 | 62.1 | 54.5 | 18 | 89.5 | 75.1 | 68.4 |
| T-value | - | 0.23 | $2.4^{***}$ | $2.17^{**}$ | - | 0.77 | -0.79 | -0.62 | - | 0.75 | 0.34 | 0.37 |

***Note:*** *($^{*}$), ($^{**}$), ($^{***}$) denote levels of significance at 10, 5 and 1 percent respectively.*

## CONCLUSION

The study focuses on application of DEA method for estimation of efficiency and factor affecting efficiency of sheep fattening. Our analysis based on a sample of 285 sheep fattening units in three regions (cold, temperate and warm) of the Fars province in Iran. The technical, allocative and economic efficiencies of sheep fattening units were calculated by DEA method. The results of this study imply that there are different efficiency scores among sheep fattening unites so that the study has shown that the gap between the EE mean and the best efficient unit is about 30-48 percent in regions of survey.

However, at the cold, temperate and warm regions the TE means have been estimated 93.1, 88.7, 91.6 percent respectively. Also, the AE means were 79.0, 59.0, 76.9, and the EE means were 73.6, 52.3, 70.6 percent respectively. Moreover, in the other part of research, the effects of various socio-economic factors of the fatteners on different levels of the all types of efficiencies (TE, AE and EE) were studied. The results show a number of socio-economic factors that can only be addressed at the sheep fattening unit's level. The findings of investigation indicated that increasing of the education level, fattening size, number of fattening period in year and credits will be cause increasing of the economic efficiency or another efficiency component and increasing of bought lamb weight will be cause decreasing the economic efficiency or efficiency component of the sheep fattening in Iran. Thus, policy makers can use the study to make effective policies in order to enhance profitability and efficiency of sheep fattening industries.

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