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The Investigation of Influential Factors on the Productivity of Broiler Farming Units (Case Study: Markazi Province)

[1]Sayed Nematollah Mosavi and [2]Sayed Mehrdad Dast Varz

[1]Department of Agricultural Economics, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran
[2]PhD Student, Agricultural Economy, Islamic Azad University, Marvdasht, Iran

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ABSTRACT

The general objective of present study is to investigate the influential factors affecting the productivity of broiler farming units in Markazi Province. In essence, the present study is a quantitative survey and applied in objective. Due to collection of the facts and data processing, the present study is also regarded as a descriptive survey. The transcendental production function was used to calculate the level of productivity in the desired units. In this regard, the independent quantative and qualitative variables such as the value of the feed, the broiler chicken and labor along with the hygiene costs were modelled based on which the dependent variable of productivity of production factors was estimated. Then, the Pearson test was used to determine the association of productivity with managerial features and the individual characteristics of managers. The results showed that there is a significant association between the age of managers and their education. There was a negative association between productivity and age while the reverse was the case for the association between productivity and education. Among the variables of planning skills and targeting, the information seeking, job, production and training skills were significant the associations of which with productivity were positive.

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INTRODUCTION

The increasing population of developing countries leads to rising demand for food. On one hand, the increased income will directly enhance the supply and demand cycle of food due to the relatively high income elasticity of food items. The simultaneous effect of these two factors is so significant that it challenges the production process in developing and developed countries and the agriculture section might not be able produce sufficient food. The scarce production resources resource can be used for those infrastructures which increase the level of production. Therefore, if the agriculture section cannot fulfill its assigned functions, the importation of food products will be inevitable as a result of which the production process becomes slow, the gap between supply and demand will rise and severe underdevelopment might continue. Due to the fact that the access to sufficient food is one of the basic rights of humankind, the governments have to implement detailed plans to improve the nutritional status of the public. Therefore, the provision of food security requires endeavors to provide access for all families to nutritional products, especially the vulnerable families and poor families. On the other hand, a major number of experts believe that rural and agricultural sections are have strategic significance among the other economic sectors.

In Iran, the poultry industry has a background of fifty years and it is one of the most investment-demanding industrial industries in the country. Therefore, the consideration of its economic aspects and productivity is highly significant. Of the measures which should be done in this regard, one could point to reduction in types and volume of wastes, especially animal waste, during different stages of production cycle of poultry industry which reduces the income and generates environmental problems.

Despite of the presumed significance of productivity, the managers of organizations in different sectors lack sufficient knowledge regarding the concept of productivity and measurement methods. As Sink (1985) stated,

Corresponding Author: Sayed Nematollah Mosavi, Department of Agricultural Economics, Marvdasht Branch, Islamic Azad University, Marvdasht, Iran

despite of the fact that the issue of productivity is regarded as a common subject of management circles in the present era it is less practically comprehended.

The endeavors to functionalize the association between inputs and outputs along with determination of the maximum achievable output lead to the design of parametric production functions in economic studies. Functions such as Cobb-Douglas and Leontief in the microeconomic theories are instances of such endeavors. Farrel (1957) first introduced a frontier method called "Farrel Productivity Frontier". He used mathematical equations to measure the distance of a decision-making unit from the above-mentioned productivity frontier as the productivity of that unit.

Udoh and Etim (2009) analyzed the technical productivity of 100 aviculture farmers through estimation of random frontier production function in one of the Nigeria states and reported the level of productivity as 0.62. The results showed that some factors such as technical equipment and experience exert significant effects upon the technical productivity.

Adepojo (2008) used the Cobb-Douglas random frontier production function and estimation of factors affecting productivity to verify the technical productivity of egg products in one of the states of Nigeria. The range of productivity was 24-93 percent the mean of which was 76 percent. Based on the findings of this study, the units that were closer to the city had higher productivity.

Research Hypotheses:

H.1-There is a significant difference of productivity among broiler farming units based on the managerial characteristics of managers.

H.2- There is a positive association between personal characteristics of managers and productivity of broiler farming units.

H.3- There is a positive association between managerial activities and productivity of broiler farming units.

Research Framework:

To measure the characteristics of managers of the aviculture units, a questionnaire designed by the researcher was used. The dependent variable for the present study is the productivity of broiler farming units of Markazi Province the measurement of which was done through a questionnaire designed by the researcher. Eviews, Excel and SPSS applications were used to sum up the values of each items of the dependent variables. The items were coded as Likert scale.

To measure the productivity, the estimation of production function was used and total productivity was determined through the estimated production function. To calculate the total productivity, the following equation was used:

$$\ln Y = \ln a_0 + \sum_{i=1}^{n} a_i \mathrm{Ln}(X_i) + \sum_{i=1}^{n} bXi \qquad (1.2)$$

In the above equation, Y refers to gross income of production unit, Xi is i^{th} input and b_i and a_i are respectively the coefficients of parameters in linear and logarithmic modes. The reason for using such a function form is its ability to measure the extension of production variable compared with inputs. The calculation of total productivity in this function can be done through equation 2.3.

$$MP_i = \frac{dy}{dxi} = Y\left(\frac{ai}{xi} + bi\right) \qquad (2.2)$$

The values of total productivity (MPi) and obtained product (Py) can be used to calculate the value of total productivity of each input.

$$VMP_i = Py.MP_i \qquad (2.3)$$

In this type of productivity, the mean value of production from an input is measured. To determine the mean productivity, the ratio of production to input might be used (APi = Y/Xi) which is a mistake. This equation is correct only when it is used for production of one item. To remove this defect, the shares of inputs in the final production should be distinguished from each other. Therefore, the mean productivity is determined through the following equation in which MPi is the final productivity and Ei is the value of production extension.

$$AP_i = MP_i / E_i \qquad (2.4)$$

In the present study, the calculation of partial productivity is followed by determination of total productivity so as to consider the mutual effects and substitution of factors, obtain a higher level of confidence and provision of realistic viewpoint of performance of units. To calculate the total productivity of all factors in the productive units, the following equation was used:

$$TFP_i = TR_i / \sum W_j(C_{ji}) \qquad (2.5)$$

In the above equation, TRi is the total received value, Cji is refers to current expenses and W_i denotes the coefficients of mean share of expenses for each input compared with total expenses of units.

The identification of economic features of broiler farming units is done through correlation tests. Non-parametric tests were used to determine the managerial features and measures. Excel Software was used to process the data and calculation of productivity for each production factor was done through Eviews Software.

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Estimation of Production Function:

To calculate productivity, the production function was used. To select the type of production function of broiler, the estimations of Cobb-Douglas and transcendental functions were used. In this regard, the independent quantative and qualitative variables such as the value of feed, value of labor, administrative and productive payments, capacity of aviculture units, hygiene expenses, other expenses, capital, age, experience and level of education were modelled and then, different tests were used to estimate model based on four variables of the value of feed, the value of broiler chicken, the value of labor and hygiene costs. The other variables were excluded due to the statistical insignificance of coefficients. The above four variables were used to estimate the function through Cobb-Douglas and transcendental functions.

The Cobb-Douglas estimation is shown in table 1.3. In this model, the function coefficients were production extensions. R^2 shows that 78 percent of changes is explained by four variables of consumed feed, broiler, labor and hygiene expenses.

Table 1.3: Estimation of Production Function in Cobb-Douglas Model.

Variable	Coefficient		t-statistic	Level of Significance
	Value	Sign		
Fixed Value	7.73	-	-6.18	5%
Logarithm of Feed Value	0.14	+	2.28	5%
Logarithm of Broiler Value	0.28	+	3.39	5%
Logarithm of Labor Value	0.22	+	2.25	5%
Logarithm of Hygiene Expenses	0.48	+	3.82	5%
n=92 F=79.13 D.W= 1.79 $\overline{R^2}$ =0.77 R^2 =0.78				

Source: Research Findings

Then, the transcendental production function was estimated the results of which are shown in table 3.2.

Variable	Coefficient		t-statistic	Level of Significance
	Value	Sign		
Fixed Value	6.18	-	-1.57	5%
Logarithm of Feed Value	0.42	+	3.47	5%
Logarithm of Broiler Value	0.68	+	3.71	5%
Logarithm of Labor Value	0.14	-	-0.54	5%
Logarithm of Hygiene Expenses	0.01	+	0	5%
Value of Feed	0.01	-	-2.74	5%
Value of Broiler in Each Cycle	0.01	-	-3.03	5%
Value of Labor	0.01	+	1.16	5%
Hygiene Expenses	0.01	+	1.27	5%
n=92 F=51.58 D.W=2.23 $\overline{R^2}$ =0.82 R^2 =0.83				

Source: Research Findings

To select the proper production function, the test of significant difference between Cobb-Douglas, transcendental functions and bound F-test were used. In this regard, the following equation was used because the transcendental function has four new variables.

$$F = \frac{(0.83-0.78)/4}{(1-0.83)/(92-8)} = 6.18 \qquad (3.1)$$

The total and mean productivity of production factors:

1-Feed:

As observed before, the mean productivity of consumed feed for the intended 92 broiler farming units was 0.607. Based on the purchase price of feed, the mean value of total productivity of feed in the intended units was 2674391120 Rial.

Table. 3.3: Partial Productivity of Feed in Broiler Farming Units through Transcendental Function.

Quantity	Mean	Maximum	Minimum
Mean Productivity	0.607	0.947	0.389
Total Productivity	69791	300000	17000
Value of Total Productivity (VMPX)	267439112	1149600000	65144000
VMPX/PX	199730	858551	48651

Sources: Research Findings

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2-Broiler:

The mean productivity of broiler for the 92 broiler farming units was 2.609 which ranges from 1.75 to 3.5. It should be noted that this value has been defined based on the loss of broiler chickens in this units. The total productivity of broiler chicken was 63093880. This means that adding one unit of broiler chicken can averagely add 630938800 Rial to the income of broiler farming unit. Due to the fact that the mean price of each broiler chicken is 11860 Rial, the addition of more broiler chickens will be economically profitable based on the above value.

Table 3.4: Partial Productivity of Broiler Chicken in the Aviculture Units (Transcendental Function).

Quantity	Mean	Maximum	Minimum
Mean Productivity	2.609	3.5	1.75
Total Productivity	16465.6	750000	4000
Value of Total Productivity (VMPX)	63093880	487400000	15328000
VMPX/PX	53199	410961	12924

Source: Research Findings

3-Labor:

The mean productivity of labor is 19474.73. The maximum and minimum productivity of labor were respectively 5000 and 47500 (in average).

Quantity	Mean	Maximum	Minimum
Mean Productivity	19474.73	47500	5000
Total Productivity	2.12	4	2
Value of Total Productivity (VMPX)	8124	15328	7664
VMPX/PX	0.002	0.003	0.0018

Source: Research Findings

4-Hygiene:

The mean productivity of hygiene for all samples was 0.0048 which ranged from 0.0083 to 0.002. The mean value of total productivity in the intended sample was 8700946 which means that usage of an additional unit for hygiene issues will averagely add 8700946 units to the final product.

Table 3.6: Productivity of Hygiene and Treatment in Intended Broiler Farming Units (Transcendental Function).

Quantity	Mean	Maximum	Minimum
Mean Productivity	0.0048	0.0083	0.002
Total Productivity	8700946	28500000	2400000

Source: Research Findings

As shown in table (3.7), the comparison of mean and total productivity of production inputs in Cobb-Douglas function shows that maximum values of mean and total values of productivity are associated with hygiene and labor.

Table 3.7: Comparison of Total and Mean Productivity of Inputs in Cobb-Douglas Function (In Average).

Production Factors	Total Productivity	Mean Productivity
Feed	0.29	2.10
Broiler Chicken	2.51	9.12
Labor	5.12	22.8
Hygiene	9.52	19.75

Source: Research Findings

As shown in the following table, the comparison of mean and total values of productivity for the production inputs as determined through transcendental function show that maximum levels of mean and total productivity are associated with hygiene and labor.

Table 3.8: Comparison of Average Values of Mean and Total Productivity of Inputs through Transcendental Function.

Production Factors	Total Productivity	Mean Productivity
Feed	69791	0.607
Broiler Chicken	16465.6	2.609
Labor	2.12	19474.73
Hygiene	8700946	0.0048

Source: Research Findings

Productivity of All Production Factors:

The equation used for the transcendental function is the following:

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$$TFP_i = \frac{X1}{0.57X2+0.13X3+0.06X4+0.06X8} \quad (3.2)$$

In the above equation, *X1* is the received value of broiler sale. X2, X3, X4 and X8 respectively refer to the prices of feed, broiler, labor and hygiene issues the coefficients of which show their mean share in the total costs of units.

Based on the results, the mean value of total productivity for the intended productive units is 87.2. In average, one-unit (Rial) additional expense in the broiler farming unit leads to 87.2 unit increase (Rial) for the producers. The least value of total productivity for production factors is 86.1 and the maximum value is 33.4.

Table 3.9: Total Productivity of Broiler Farming Units through Transcendental Function.

Quantity	Mean	Maximum	Minimum
Total Productivity	2.87	4.33	1.86

Source: Research Findings

Findings of Managerial Characteristics:

1-Planning Skills and Targeting:

The results of the following table show that the respondents believe that mean level of their competency and productivity in managerial skills is 3.24 which is higher than the average. The analysis of skills showed that the respondents had the highest level of competency in planning during difficult situations and following such plans whole the least level of competency among them was observed regarding prediction of production in a cycle of broiler farming.

Table 3.10: Frequency Distribution of Viewpoints of Respondents regarding Competency in Planning and Targeting .

Row	Item	Mean	Standard Deviation
1	Do you have a plan for difficult situations and to what extent do you follow it?	3.95	0.64
2	To what extent you can predict the necessary inputs for a definite broiler farming cycle?	3.52	0.69
3	To what extent you can plan for production domain and define your short- and long-term objectives?	3.42	3
4	To what extent you can properly estimate the production costs during a cycle of broiler farming?	2.97	0.95
5	To what extent you can properly estimate the income of production during a cycle of broiler farming?	2.91	0.92
6	To what extent you can properly predict the production during a cycle a broiler farming?	2.72	0.94
	Mean	3.24	0.83

Sources: Research Findings

2-Accounting and Financial Management:

The analyses show that the mean level of respondents' competency in this field is 3.25 which shows their moderate level of skills. In this regard, the ability to register and calculate the initial investment is a top priority while the ability to establish an effective and proper accounting system is the last priority due to lack of sufficient training.

Table 3.11: Frequency Distribution of Viewpoints of Respondents regarding Competency in Accounting and Financial Management

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to register and calculate the value of initial investment in broiler farming unit?	3.61	0.64
2	To what extent you have the ability to register the value of consumed items in broiler farming unit?	3.43	0.70
3	To what extent you have the ability to purchase large values of materials to get discounts?	3.27	0.71
4	To what extent you have the ability to register the level of production in broiler farming unit?	3.26	0.79
5	To what extent you have the ability to register and calculate the values of profit and loss in broiler farming unit?	3.22	0.84
6	To what extent you have the ability to follow trainings to improve your financial management skills?	3.17	0.85
7	To what extent you have the ability to effectively use different financial and credit resources?	3.08	0.74
8	To what extent you have the ability to create an effective accounting system?	2.97	4.19
	Mean	3.25	1.18

Sources: Research Findings

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3-Marketing Skills:

The following table shows that the ability to select the best time to sell the products is the top-ranked competency among marketing skills as verified from the viewpoints of respondents. In this regard, mean value of respondents' ability in this field of management was 3.04 which shows their moderate level of ability.

Table 3.12: Frequency Distribution of Viewpoints of Respondents regarding Competency in Marketing Management

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to select the best time to sell the products?	3.44	0.70
2	To what extent you have the ability to directly provide products to consumers (instead of slaughterhouse)?	3.25	0.83
3	To what extent you have the ability to analyze the supply and demand as well as the price of eggs?	3.00	0.75
4	To what extent you are familiar with the role of forums in direct sale of products?	2.95	0.76
5	To what extent you can analyze the governmental policies regarding your market?	2.85	0.75
6	To what extent you are familiar with modern methods of packing?	2.75	0.80
	Mean	3.04	0.76

Sources: Research Findings

4-Knowledge Skills:

As shown in table (3.13), the mean values of respondents' competency in this field of management was in a moderate to high level. The ability collect data of modern technologies of the market has the least level among the directors and managers of broiler farming units for which the most significant reason is the low level of education of managers in these units.

Table 3.13: Frequency Distribution of Viewpoints of Respondents regarding Competency in Knowledge Skill .

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to search for newer methods to do the procedures?	3.19	0.70
2	To what extent you have the ability to collect information on prices of input items and market?	3.17	0.82
3	To what extent you have the ability to collect information on the state policies of market?	2.98	0.90
4	To what extent you have the ability to collect information regarding state policies of modern technologies?	2.98	0.77
	Mean	3.08	0.80

Sources: Research Findings

5-Skills of Rationality in Decision Making:

The results of table (3.14) shows that the ability of managers in rational decision-making is moderate to high. To measure this skill, six items were used and the results show that managers regard themselves as more competent in quick identification of production problems and proper attention to solving them compared with other characteristics.

Table 3.14: Frequency Distribution of Viewpoints of Respondents regarding Competency in Rational Decision-making .

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to quickly identify the production problems and properly solve them?	3.68	0.64
2	To what extent you have the ability to quickly analyze unprecedented situations?	3.53	3.06
3	To what extent you have the ability to effective use production consultants (economy, veterinary, nutrition, etc.)?	3.42	0.60
4	To what extent you have the ability to apply the best managerial methods in production operations of broiler farming unit?	3.31	0.64
5	To what extent you have the ability to make correct decisions during the application or awareness of new technologies?	3.20	0.72
6	To what extent you have the ability to make correct decisions on the technologies which should be reviewed or used?	3.16	0.84
	Mean	3.38	1.08

Sources: Research Findings

6- Skills of Mobilizing Resources:

The ability to complete activities in the best possible time and with the lowest duration and highest performance was reported as the highest competency among the skills of mobilizing resources which was verified through the answers of directors of broiler farming units.

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Table 3.15: Frequency Distribution of Viewpoints of Respondents regarding Competency in Skills of Mobilizing Resources .

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to execute activities in the least possible time, the lowest period of time and with the highest performance?	3.46	0.06
2	To what extent you have the ability to use the materials with the lowest prices to obtain maximum productivity?	3.19	0.65
3	To what extent you have the ability to select technologies and methods which can enhance the usage of resources?	3.06	0.62
4	Mean	3.24	0.62

Sources: Research Findings

7-Risk-taking Skills:

The data analysis showed that the ability of respondents in risk-taking skill is in a moderate to high level. As shown in the following table, the ability to properly use the insurance of agricultural and livestock insurances is in a high level while the low level of essentiality of risk-taking shows the high level of risk aversion among the managers of production units.

Table 3.16: Frequency Distribution of Viewpoints of Respondents regarding Competency in Risk-taking Skill .

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to properly use insurances of agricultural and veterinary products?	4.02	0.88
2	To what extent you have the ability to save and deposit in emergency financial accounts?	3.97	0.89
3	To what extent you have the ability to predict and develop strategies to inhibit the threats against production?	3.54	0.65
4	Do you agree that “risk-taking is sometimes essential”?	3.33	0.78
5	To what extent you have the ability to effectively manage financial and production risks?	2.99	0.71
	Mean	3.57	0.78

Sources: Research Findings

8-Communicational Skills:

The results of data analysis show that the mean value of respondent’s communicational skills is 3.81 which shows a middle to high level. Among the verified characteristics in this field, communication with others about the problems to attain proper solutions and ability to help the employees to improve their competencies and skills are respectively high ranked in the answers of respondents. On the other hand, the ability to authorize to do definite procedures has the lowest value which shows that managers of broiler farming units follow traditional management styles and they have failed to realize the measures of participatory management. The ability to establish good relationships with buyers and vendors has the third top position which implies attention to clients and significance of human relation management.

Table 3.17: Frequency Distribution of Viewpoints of Respondents regarding Competency in Communicational Skill .

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to establish relationships with others to solve existing problems and obtain proper results?	4.01	0.43
2	To what extent you have the ability to help the employees to improve their skills and competencies	3.97	0.45
3	To what extent you have the ability to establish good and favorable relationships with buyers and vendors?	3.96	0.46
4	To what extent you have the ability to establish good, precise and honest relationships with others?	3.92	0.40
5	To what extent you have the ability to create a balance between the skills of employees and their job requirements?	3.83	0.48
6	To what extent you have the ability to pay attention to the viewpoints of other individuals in regard to management issue of the unit?	3.83	0.60
7	To what extent you have the ability to define distinctive tasks for each employee?	3.80	0.54
8	To what extent you have the ability to listen to the viewpoints of employees and realize their suggestions to improve production?	3.78	0.55
9	To what extent you have the ability to transfer experiences and knowledge to new employees in the broiler farming unit?	3.76	0.47
10	To what extent you have the ability to avoid the dominative behaviors in relationship with employees?	3.67	0.47
11	To what extent you have the ability to authorize others to do the associated affairs?	3.40	0.85
	Mean	3.81	0.52

Sources: Research Findings

9-Occupational and Production Skills:

The mean value of manager's ability in realizing occupational and production skills is 3.70 which shows their high to very high level of competency in this regard. Most of the items underlying this field of skills were in proper levels. In this regard, the ability to prepare the saloon before the arrival of a new shipment of broiler chickens, ability to run the seed holders and water tanks have the best status.

Table 3.18: Frequency Distribution of Viewpoints of Respondents regarding Occupational and Production Skills.

Row	Item	Mean	Standard Deviation
1	To what extent you have the ability to prepare saloon before arrival of a new shipment of broiler chickens?	4.04	0.62
2	To what extent you have the ability to manage the seed holders?	4.03	0.67
3	To what extent you have the ability to manage the water tanks?	4.02	0.62
4	To what extent you have the ability to manage the physical setting (air-conditioning, setting temperature, light and humidity)?	3.98	0.58
5	To what extent you have the ability to control density in the broiler farming unit?	3.73	0.64
6	To what extent you have the ability to manage the accession and raising of broiler chickens?	3.69	0.72
7	To what extent you have the ability to control the hygiene conditions through essential treatment measures?	3.61	0.78
8	To what extent you are familiar with laws of job and insurance?	3.18	0.69
9	To what extent you have the ability to ration the broiler farming unit?	3.15	0.88
10	Mean	3.70	0.69

Sources: Research Findings

As shown in table (3.19), the managers have the highest ability in communicational skills and the least level of competency in marketing skills.

Table 3.19: Frequency Distribution of Respondents' Viewpoints of Management Characteristics.

Row	Domain	Mean	Standard Deviation
1	Communicational Skills	3.81	0.52
2	Competency in Occupational and Production Skill	3.70	0.69
3	Competency in Risk-taking Skill	3.57	0.78
4	Competency in Rational Decision-making Skill	3.38	1.08
5	Accounting and Financial Management Skill	3.25	1.18
6	Competency in Skill of Mobilizing Resources	3.24	0.62
7	Planning and Targeting Skill	3.24	0.83
8	Competency in Knowledge Skill	3.08	0.80
9	Competency in Marketing Skill	3.04	0.76

Sources: Research Findings

10-Categorization of Competencies of Directors of Broiler Farming Units:

To group the competencies of directors of the desired broiler farming units, the method of distance between standard deviation and mean is used (Feli et.al, 2008; Tavasoli et.al, 2008)

A= Low: A< Mean-SD

B=Moderate: Mean- SD <B< Mean

C=Good: Mean< C< Mean+ SD

D=Excellent: Mean+ SD < D

In this regard the mean value of managerial ability is 3.47 and its standard deviation was 0.27. The above formulas were used to group the directors of broiler farming units. Most of the directors were in a range of moderate (35 percent) to high (27 percent).

Table 3.20: Grouping Directors of Broiler Farming Units based on Competencies in Managerial Skills.

Level of Competency	Frequency	Percentage	Cumulative Percentage
Low	16	17	17
Moderate	35	38	55
High	24	27	82
Excellent	17	18	100

Source: Research Findings

11-Ananlysis of Influential Managerial Factors upon Productivity:

Due to the fact that the variables of productivity, age, experience, education and competency are relative and interval variable, the Pearson test was used to verify the association of two interval variables, two relative variables, one relative variable and one interval variable. This test was done through SPSS Software. The Pearson Test was used to determine the association between productivity and managerial characteristics the results of which are shown in the following.

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Table 3.21: Pearson Test of Association between Productivity and Manager's Characteristics through Transcendental Function

Variable	Pearson Correlation Coefficient	Decision Variable
Education	0.095	0.366
Age	-0.040	0.707
Experience	-0.118	0.264
Planning and Targeting	-0.094	0.374
Accounting and Financial Management	0.088	0.404
Marketing Skill	-0.017	0.871
Communicational Skill	0.052	0.621
Rational Decision-making Skill	-0.166	0.114
Resource Mobilization Skill	-0.012	0.909
Risk-taking Skill	0.005	0.965
Relationship Skills	-0.034	0.746
Occupational and Production Skill	-0.001	0.991
Training Skill	0.027	0.800

Source: Research Findings

4-Conclusion and Further Suggestions:

Based on the results of present study, only 32 percent of the verified units have managers with B.A degree or higher. The educational degree of others was diploma or lower. Over 60 percent of managers were higher than 41 years old. Due to the negative association between the age of managers and productivity, it is recommended to employ managers with lower ages.

The analysis of input items for the broiler farming units showed that feed is the most important factor of production with a share of 57 percent of total expenses. On the other hand, the cost of buying one broiler chicken consists 13 percent of total costs. In general, the results of present study showed that the mean level of competencies of directors of broiler farming units is 3.81 which is in a range of moderate to high level so that 59 percent of respondents were in this range.

Based on the results of present study, the following recommendations are suggested to improve the productivity of broiler farming units:

1- Proper procedures should be applied for employing technical managers so that their technical abilities can be completely utilized. In this regard, holding specialized compact courses for the managers of broiler farming units can be useful.

2- As stated before, hygiene has the highest coefficient and effect among other factors. This factor can increase the production level of broiler farming units. Therefore, it is suggested that such units in different towns sign contracts in cumulative manner and consult with specialists of livestock diseases so that during difficult situations, they can act in a more integrated manner.

3- The associated organizations, especially Agricultural Jihad Organization should pay attention to training for managers of broiler farming units. An educational-promotional course for efficient management of these units should attend to the following items: 1-production and marketing as two complementary concepts 2-education of applied managerial skills based managers' techniques of administration 3-consultation of production affairs based on production history, performance and analysis of profitability as well as accounting records and evaluation of available production resources 4-ability of managers' entrepreneurship skill, interests and authorities should be integrated with those of their peers to help them take the special market opportunities.

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Annex 1: Estimation of Transcendental Production Function through EViews Software

Dependent Variable: LY				
Method: Least Squares				
Date: 12/05/13 Time: 01:07				
Sample: 1 93				
Included observations: 92				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.419699	2.358863	-0.177924	0.8592
LDAN	-0.028497	0.256279	-0.111197	0.9117
LJOJ	0.841613	0.265271	3.172654	0.0021
LKAR	2.244351	2.133141	1.052134	0.2958
LBEH	0.215403	0.221327	0.973233	0.3333
DAN	2.86E-06	4.06E-06	0.705088	0.4827
JOJ	-1.92E-06	1.77E-05	-0.108449	0.9139
KAR	-0.873012	0.876438	-0.996091	0.3221
BEH	-2.30E-08	2.61E-08	-0.882732	0.3799
R-squared	0.937525	Mean dependent var		10.51947
Adjusted R-squared	0.931503	S.D. dependent var		0.514528
S.E. of regression	0.134662	Akaike info criterion		-1.079398
Sum squared resid	1.505103	Schwarz criterion		-0.832701
Log likelihood	58.65231	Hannan-Quinn criter.		-0.979829
F-statistic	155.6912	Durbin-Watson stat		1.487944
Prob(F-statistic)	0.000000			

Annex 2: Estimation of Total Productivity through Variables of Personal and Managerial Characteristics of Managers through EViews Software

Dependent Variable: TFP				
Method: Least Squares				
Date: 10/22/13 Time: 07:38				
Sample: 1 92				
Included observations: 92				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.071676	7.837770	1.029843	0.3063
A	-0.952050	1.238097	-0.768962	0.4442
AM	1.103184	0.654423	1.685735	0.0958
BM	-1.182538	0.884799	-1.336504	0.1853
RP	0.769384	0.766121	1.004259	0.3184
MT	0.485780	0.822392	0.590691	0.5564
MM	-0.041514	0.500568	-0.082933	0.9341
MI	0.409652	0.690910	0.592916	0.5550
MB	-1.247670	0.990506	-1.259629	0.2116
SEN	-0.077105	0.076649	-1.005955	0.3175
TAH	-0.251635	0.420106	-0.598980	0.5509
TAJ	0.085263	0.062147	1.371960	0.1740
TG	-0.315670	0.537262	-0.587553	0.5585
TH	0.143006	0.763988	0.187183	0.8520
R-squared	0.124570	Mean dependent var		3.354600
Adjusted R-squared	-0.021335	S.D. dependent var		3.032539
S.E. of regression	3.064718	Akaike info criterion		5.217056
Sum squared resid	732.6146	Schwarz criterion		5.600807
Log likelihood	-225.9846	Hannan-Quinn criter.		5.371941
F-statistic	0.853775	Durbin-Watson stat		2.230339
Prob(F-statistic)	0.603298			

Annex 3: Estimation of Productivity through Personal Characteristics of Managers through EViews Software

Dependent Variable: TFP				
Method: Least Squares				
Date: 10/22/13 Time: 07:40				
Sample: 1 92				
Included observations: 92				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
SEN	-0.101949	0.065891	-1.547246	0.1254
TAJ	0.089820	0.055773	1.610460	0.1109
TAH	-0.289385	0.406626	-0.711674	0.4785
C	7.758168	3.302583	2.349121	0.0211
R-squared	0.043517	Mean dependent var		3.354600
Adjusted R-squared	0.010909	S.D. dependent var		3.032539
S.E. of regression	3.015952	Akaike info criterion		5.088213
Sum squared resid	800.4452	Schwarz criterion		5.197856
Log likelihood	-230.0578	Hannan-Quinn criter.		5.132466
F-statistic	1.334564	Durbin-Watson stat		2.295071
Prob(F-statistic)	0.268310			

Annex.4: Pearson Test of Association between Productivity and Characteristics of Managers through SPSS Software

Correlations

		tfp	tah	sen	taj	th	mm
tfp	Pearson Correlation	1	.144	-.141	-.059	.177*	.104
	Sig. (1-tailed)		.085	.090	.288	.046	.161
	N	92	92	92	92	92	92
tah	Pearson Correlation	.144	1	-.509**	-.535**	.101	.050
	Sig. (1-tailed)	.085		.000	.000	.168	.317
	N	92	92	92	92	92	92
sen	Pearson Correlation	-.141	-.509**	1	.752**	-.127	-.131
	Sig. (1-tailed)	.090	.000		.000	.114	.106
	N	92	92	92	92	92	92
taj	Pearson Correlation	-.059	-.535**	.752**	1	-.039	-.058
	Sig. (1-tailed)	.288	.000	.000		.355	.292
	N	92	92	92	92	92	92
th	Pearson Correlation	.177*	.101	-.127	-.039	1	.310**
	Sig. (1-tailed)	.046	.168	.114	.355		.001
	N	92	92	92	92	92	92
mm	Pearson Correlation	.104	.050	-.131	-.058	.310**	1
	Sig. (1-tailed)	.161	.317	.106	.292	.001	
	N	92	92	92	92	92	92
mb	Pearson Correlation	.062	.058	-.254**	-.189*	.057	.276**
	Sig. (1-tailed)	.279	.292	.007	.035	.294	.004
	N	92	92	92	92	92	92
mi	Pearson Correlation	.155	.024	-.227*	-.018	.124	.283**

	Sig. (1-tailed)	.071	.410	.015	.434	.120	.003
	N	92	92	92	92	92	92
tg	Pearson Correlation	.020	.075	-.052	.009	.048	.123
	Sig. (1-tailed)	.424	.237	.311	.464	.325	.121
	N	92	92	92	92	92	92
bm	Pearson Correlation	.015	.029	-.090	-.065	.085	.257**
	Sig. (1-tailed)	.443	.393	.196	.271	.211	.007
	N	92	92	92	92	92	92
rp	Pearson Correlation	.112	.099	-.190*	-.196*	.352**	.292**
	Sig. (1-tailed)	.144	.173	.035	.031	.000	.002
	N	92	92	92	92	92	92
a	Pearson Correlation	.120	.022	-.163	.049	.265**	.167
	Sig. (1-tailed)	.127	.418	.061	.323	.005	.055
	N	92	92	92	92	92	92

Correlations							
		mb	mi	tg	bm	rp	a
tfp	Pearson Correlation	.062	.155	.020	.015	.112*	.120
	Sig. (1-tailed)	.279	.071	.424	.443	.144	.127
	N	92	92	92	92	92	92
tah	Pearson Correlation	.058	.024	.075**	.029**	.099	.022
	Sig. (1-tailed)	.292	.410	.237	.393	.173	.418
	N	92	92	92	92	92	92
sen	Pearson Correlation	-.254	-.227**	-.052	-.090**	-.190	-.163
	Sig. (1-tailed)	.007	.015	.311	.196	.035	.061
	N	92	92	92	92	92	92
taj	Pearson Correlation	-.189	-.018**	.009**	-.065	-.196	.049
	Sig. (1-tailed)	.035	.434	.464	.271	.031	.323
	N	92	92	92	92	92	92
th	Pearson Correlation	.057*	.124	.048	.085	.352	.265**
	Sig. (1-tailed)	.294	.120	.325	.211	.000	.005
	N	92	92	92	92	92	92
mm	Pearson Correlation	.276	.283	.123	.257	.292**	.167
	Sig. (1-tailed)	.004	.003	.121	.007	.002	.055
	N	92	92	92	92	92	92
mb	Pearson Correlation	1	.493	.287**	.128*	.353	.094**
	Sig. (1-tailed)		.000	.003	.111	.000	.187
	N	92	92	92	92	92	92
mi	Pearson Correlation	.493	1	.303*	.279	.340	.219**
	Sig. (1-tailed)	.000		.002	.003	.000	.018
	N	92	92	92	92	92	92
tg	Pearson Correlation	.287	.303	1	.166	.180	.116
	Sig. (1-tailed)	.003	.002		.057	.043	.135
	N	92	92	92	92	92	92
bm	Pearson Correlation	.128	.279	.166	1	.288	.123**
	Sig. (1-tailed)	.111	.003	.057		.003	.122
	N	92	92	92	92	92	92
rp	Pearson Correlation	.353	.340	.180*	.288*	1**	.023**
	Sig. (1-tailed)	.000	.000	.043	.003		.413
	N	92	92	92	92	92	92
a	Pearson Correlation	.094	.219	.116	.123	.023**	1
	Sig. (1-tailed)	.187	.018	.135	.122	.413	
	N	92	92	92	92	92	92

Correlations			
		mt	Am
tfp	Pearson Correlation	.147	.166
	Sig. (1-tailed)	.080	.057
	N	92	92
tah	Pearson Correlation	.023	.073
	Sig. (1-tailed)	.415	.244
	N	92	92
sen	Pearson Correlation	-.144	-.318**
	Sig. (1-tailed)	.085	.001
	N	92	92
taj	Pearson Correlation	.072	-.201**
	Sig. (1-tailed)	.247	.027
	N	92	92
th	Pearson Correlation	.230*	-.077
	Sig. (1-tailed)	.014	.232
	N	92	92
mm	Pearson Correlation	.188	.136
	Sig. (1-tailed)	.036	.099

	N	92	92
mb	Pearson Correlation	.240	.157
	Sig. (1-tailed)	.011	.068
	N	92	92
mi	Pearson Correlation	.365	.200
	Sig. (1-tailed)	.000	.028
	N	92	92
tg	Pearson Correlation	.192	.074
	Sig. (1-tailed)	.033	.242
	N	92	92
bm	Pearson Correlation	.255	.219
	Sig. (1-tailed)	.007	.018
	N	92	92
rp	Pearson Correlation	.142	.172
	Sig. (1-tailed)	.089	.051
	N	92	92
a	Pearson Correlation	.310	.143
	Sig. (1-tailed)	.001	.086
	N	92	92
*. Correlation is significant at the 0.05 level (1-tailed).			
**. Correlation is significant at the 0.01 level (1-tailed).			