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IJNES

INTERNATIONAL JOURNAL of

NATURAL and ENGINEERING SCIENCES

Volume 2 Number 2 May 2008 ISSN 1307-1149

NOBEL SCIENCE AND RESEARCH CENTER
www.nobelonline.net

Published by;

Nobel Publishing and Nobel Science Research Center

nobel PUBLISHING

International Journal of Natural and Engineering Sciences 2 (2): 87-89, 2008
ISSN: 1307-1149, www.nobelonline.net

Factors Affecting the Success of Farmers in Cattle Farms in Turkey

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Received: February 04, 2008
Accepted: March 20, 2008

Abstract

This study was carried out to determine the factors affecting the success of cattle farms. The survey study has been conducted with 480 farmers in four cities (Erzurum, Agri, Van and Elazig), with 17 percent rate of total cattle number existing in Turkey. Out of these survey data, three different models have been formed for dairy farms, beef farms, and mix farms that raise cattle both for dairy and beef. According to regression results, in dairy farms, the success of the farmers is affected more by the change in the amount of concentrate food than other variables. Whereas, in cattle fattening farms, the most significant factors affecting the success of the farmer are education level, age of the farmer and change in the number of cattle.

Key words: Farmer success, Cattle farms. Econometric modelling

INTRODUCTION

In the farm holdings, success of the farm depends on consistency of decisions taken by farmer. How decisions -taken by farmer for a more profitable activity are consistent, farm is so successful and has profit at the end. The situation is the same for livestock farms being sub-sector of agriculture. Farming is a risky business. Agriculture sector has both economical and natural risks. However, enterprise diversification is a risk management strategy an individual farmer can use to reduce the adverse impact of wide fluctuations in yields and/or prices of specific commodities, whether due to natural causes such as weather or the impact of uncertainties derived from business cycles, wars, or other factors. Besides its risk-reduction benefits, diversification provides an opportunity to exploit the potential complementary and/or supplementary relationships between enterprises through improved utilization of the natural resources of the farm and management skills over the entire year [1]. Among agricultural activities, it is seen that animal production faces more risks. According to that condition, decisions taken by farmer takes consideration against risks that farmer comes face to face. In cattle farms, success of farmer depends on farmer's personal characteristics. Therefore, activity results acquired from farms are different.

Ilbery suggests "business diversification can be viewed as the outcome of a range of factors working both externally and internally on the farm household". Internal factors include farm and farm household characteristics that help to determine the nature of diversification, if any, undertaken by the farm business [2].

A common finding in the literature on farm diversification is the correlation between farm size and diversification. Findings by some researchers indicate large farms are more likely to be diversified [2,3,4] because they can exploit capital more effectively and more efficiently employ available labor. However, White and Irwin, using aggregate U.S. Census data to compare diversification across farm size classes, concluded that larger farms are more specialized based on the perceived benefits from economies of scale [5]. In analyzing data on 2 192 farms across three U.S. regions, Sun, Jinkins, and El-Osta (1995) distinguished between different stages of diversification which were found to influence the relationship between size and diversification [6].

In a study of California farmers, Pope and Prescott used net worth per acre cropped as a measure of financial risk. They found that farms with higher net worth are more specialized, and farm organization has an impact on diversification. Corporate farms were found to be more specialized than other farms. Further, the authors note that increased farm diversification places greater demands on management and coordination skills. Improved managerial skills, education, and training better prepare the farm operator to direct a farm which is more diversified. Another factor identified as critical in diversification is age of the operator. Because farmers tend to accumulate wealth over a lifetime, one would expect older farm operators to be less likely to engage in diversification since age and wealth are positively correlated. Based on this relationship, Pope and Prescott argue that wealthier farmers are less risk averse and hence less diversified, all else being equal [3].

Since cattle farm is an important branch of agriculture, in cattle farms, defining the characteristic effects of farm and farmer's decisions on activity result is an important factor. Both personal characteristics of farmer such as education level and age and decisions of farmer taken about using of inputs, amount of hay and concentrate feeds to feed animals in farm, number of workers, vaccination, medicine are factors that affect farmer's success.

The aim of this study is to determine the factors affecting success of farmers in Erzurum, Agri, Van and Elazig, in east of Turkey using the results of questionnaire obtained from farms. It is important to determine the factors affecting the success of farmers to improve agricultural policies. Policies can lead to discover the factors affecting the success of farmers positively. First, the characteristics of the successful farmers can be determined. Then, policies can be made to establish the farms having these characteristics (e.g., farmers having these characteristics can be supported to encourage them).

MATERIALS AND METHODS

There are 4 level II sub-regions in East Anatolian Region. For each of these sub-regions, it has been selected one city. In this selection, it has been taken into account the animal number as a livestock. This study is made in 4 cities (Erzurum, Agrı, Van and Elazıg), in East Anatolian Region. These cities represent East Anatolian Region in view of breeding cattle number. East Anatolian Region has the most proportion in the number of cattle existing in Turkey. In addition to, these cities (Erzurum, Agrı, Van and Elazıg) have 17 percent rate of total cattle number existing in Turkey [7].

In research and applications releated to agricultural farms, accounting records on farms of agriculture form the most significant data source. Accounting records are not registered in nearly complete part of the agricultural farms in Turkey. Research and applications about agriculture, generally, depend upon questionnaire data. Since are not accounting records, as general part of Turkey, in livestock farms of Erzurum, Agri, Van and Elazig, necesarry data for that research is gathered by using 480 questionnaires (Table 1).

Table 1. The number of the sample farm gattered questionnaires

Cities	The Number of Farmer
Erzurum	92
Agri	126
Van	106
Elazig	156
Total	480

In cattle farms, econometric model used in analysis of factors affecting farmer's success consists of gross production value of dairy cattle and gross production value of beef cattle and gross margin including both of them. Least squares method was used to estimate the model obtained from farms [8,9]. Model SHAZAM was estimated at econometric computer programme [10].

Functional style of estimated model is as below

gpcm = f (*age, lfe, twcdcı, vcdc, ocdc, cfcdc, hcdc, ndc* ***)***

gpvbc = f (*age, lfe, ctwbc, vcbc, ocbc, ccabc, hcabc, nbc* ***)***

gm = f (*age,lfe, ndc, nbc, cfcdc, hcdc, ccabc, hcabc, scdc, scbc* ***)***

Here,

gm **:** Gross Margin ($)

age **:** Age of farmer

lfe Level of Farmer's Education (illiterate: 1, primary school: 2, middle: 3, high: 4, university: 5)

gpdc**:** Gross production value of dairy cow ($)

scdc**:** special costs of dairy cattle breeding (temporary worker, veterinarian, vaccination, medine etc)

cfcdc**:** Concentrated feed consumed by dairy cattle (kg)

hcdc**:** Hay consumption of dairy cattle (kg)

ndc**:** number of dairy cow (per head)

twcdc**:** Temporary worker cost of dairy cattle ($)

vcdc **:** veterinarian cost of dairy cattle ($)

ocdc**:** other cost of dairy cattle (pad, heating, illuminating... etc)

gpvbc**:** Gross production value of beef cattle ($) ***scbc*****:** Special costs of beef cattle (worker, veterinarian, vaccination, medicine. etc).($)

ccabc**:** Consantrated consumption amount of beef cattle (kg)

hcabc**:** Hay consumption amount of beef cattle (kg)

nbc **:** number of beef cattle

ctwbc**:** cost of temporary worker of beef cattle ($)

vcbc**:** Veterinarian cost of beef cattle ($)

ocbc**:** other costs of beef cattle (pad, heating, illuminating... etc)

RESULTS AND DISCUSSION

Model of gross production value of dairy cattle farm is explained with high R^2 value as 0,918 (Table 2). When sings of coefficients are taken into considerations, it is realized that they are logical. Coefficient of temporary worker cost for dairy cattle farms and farmer's age was found to be negative. Increases in education level, cost of veterinarian, other costs, amounts of concentrate feed and hay increased gross production value in dairy cattle farms. Costs of temporary workers, amounts of concentrated and hay feed used for dairy cattle farm and number of dairy cattle variations are found statistically significant (P=0,05)

Table 2. Conclusions of estimate of gross production value model of dairy cattle breeding

R^2 = 0,918					
	Coefficient	Standard error	t	p-value	Elasticity
Age	-0.41	8.25	-0.05	0.960	-0.007
Lfe	258.80	172.40	1.50	0.136	0.200
Twcdc	-1.57	0.71	-2.20	0.030	-0.059
Vcdc	3.01	1.81	1.66	0.101	0.017
Ocdc	0.46	2.03	0.23	0.821	0.011
Cfcdc	0.61	0.03	18.60	0.000	0.213
Hcdc	0.02	0.21	0.07	0.941	0.004
Ndc	254.51	27.05	9.41	0.000	0.834

Sings of all parameters obtained from the model tried to be explained by 8 different factors, which affects gross production value of beef cattle, were found to be logical (Table 3). Increase in age of farmer decreased profit acquired from beef cattle breeding. Because, old farmers can not deal with that

fatiguing jobs, and their profit are less than young farmers. All of the factors, except for other costs of beef cattle were found significant. High T rate as 44,48 of education level parameter showed that this factor is more effective than other factors in explaining the model

Table 3. Estimated results of gross production value model of beef cattle breeding

$R^2 = 0,973$					
	Coefficient	Standard error	t	p-value	Elasticity
Age	-1.14	0.06	-17.80	0.000	-0.022
Lfe	133.79	3.01	44.48	0.000	0.112
Ctwbc	-31.65	3.87	-8.18	0.000	-0.643
Vcbc	13.09	2.53	5.17	0.000	0.085
Ocbc	-0.11	1.01	-0.11	0.916	-0.001
Ccabc	0.91	0.10	9.62	0.000	0.184
Hcabc	0.99	0.12	8.47	0.000	0.199
Nbc	674.41	46.95	14.36	0.000	1.212

In cattle farms the model is defined as a high value of R^2 such as 0,948 by 10 independent variations affecting gross production value (Table 4). In model, signs of independent variations are found to be logical. Age, education level number of dairy cattle, number of beef cattle, amount of concentrate and hay feeds are found statistically significant (P=0,05). It is seen that in Erzurum province where the questionnaire was made, education level of farmers in cattle farms is low. In examined farms, 15-45 age group consisted of 47,75 % of workable population.

Table 4. Estimated results of total gross production value model

$R^2 = 0,948$					
	Coefficient	Standard error	t	p-value	Elasticity
Age	-16.03	7.09	-2.26	0.024	-0.108
Lfe	353.54	125.50	2.82	0.005	0.103
Ndc	282.63	33.11	8.54	0.000	0.352
Nbc	366.55	98.58	3.72	0.000	0.230
Cfcdc	1.86	0.40	4.67	0.000	0.248
Hcdc	0.93	0.39	2.36	0.018	0.084
Ccabc	2.96	2.18	1.36	0.175	0.209
Hcabc	2.74	2.17	1.26	0.207	0.192
Scdc	-0.26	0.35	-0.76	0.448	-0.068
Scbc	-2.07	2.09	-0.99	0.322	-0.332

For farmers' success, existences of animal and breed race dispersion of these animals are important factors. In farms where the questionnaires were administered, the average number of cattle is 8,76. In farms, domestic, cross-breed and culture consisted of 32,6 %, 39,2 % and 28,2 % of total cattles, respectively. According to regression analysis results, as farmer age increased in dairy and beef cattle farms, acquired gross production value decreased.

When regression analysis result of total gross production value was examined, it was shown that when education level of farmer increases, his income statistically increases, too.

According to regression analysis, although increase in concentrate feed used for beef and dairy cattle nutrition had statiscally significant effect on farmer's income in a positive way. Farmer's income was not affected by an increase in hay usage.

Farmer's success is measured by farmer's income acquired from farm. To increase income of farmers who were made questionnaire can depend on decrease in number of local breeds consisting of an important part of cattle population. Increase in concentrate feed used for dairy and beef cattle nutrition in farms will increase farmer's income. Increasing education level, also, will affect farmer's success in a positive way.

In dairy farms, the success of the farmer is affected more by the change in the amount of concentrate feed than the other variables. Whereas, in cattle fattening farms, the most significant factors affecting the success of the farmer are education level, age of the farmer and change in the number of cattle.

Since younger farmers take higher risks and are open-minded to changes/innovations, they are more successful. When we look at the results of total gross product value regression analysis, as the education level increases the income of the farmer increases statistically significant, as well. We can interpret this positive relation between education level and income as increase in education level can lead up to more modern and conscious cattle/dairy farming.

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