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Determinants of cost of apple production in the area of Korca - an econometric approach

ALDONA MINGA[1]
Phd. Candidate
Agricultural University of Tirana, Albania
Dr. ILIR SOSOLI
Lector

Abstract:

The apple cultivation and production is one of the major segments in the Korca district. In the context of welfare, apple production and cultivation has an important role to farmers for income generation. The study is about determining the cost of apple production in the Korça region. One hundred and fifty families of farmers involved in cultivation and production of apple were selected using random multi-stage selection techniques. Well-structured questionnaires were the main tool for data collection. The data collected was analyzed using cost statistical analysis and multiple linear regressions.

Key words: apple, production, cost analysis, econometric model, farmer, Korça region

INTRODUCTION

Agriculture is still an important economic sector constituting around 22.5 percent of the GDP, providing the income base for most of the population and serves as an employment safety net.

[1] This study is part of the dissertation's topic of Msc. Aldona MINGA (PHD Candidate)

Out of the total population of the country, around 58% live in rural areas of which almost 50% are engaged in agriculture. Therefore most rural households in Albania survive with small-scale subsistence agriculture[2].

Agricultural products are part of the formation of the country's regional identity, with a wide range of environmental, natural and climatic changes.

The production of fruit trees in 2016 was 261 754 tons and was characterized by an increase of 7.6% compared to the previous year. The highest level of the orchard production is achieved in the south-eastern area of the country, in the Korça district.[3]

Data on the orchards production includes fruit trees and scattered fruit trees. The most important fruit trees in terms of production to total production are apples, which account for 38.9% of production.

000 ton

Nr	Descriptions	2012	2013	2014	2015	2016
1	Orchards	210,0	218,0	220,0	245,0	261,0
2	Olives	108,0	92,0	98,0	96,0	99,0
3	Citrus	18,9	20,0	21,0	30,0	40,0
4	Grapes	196,8	204,0	203,7	205,0	205,1

METHODOLOGY

The aim of the research problem

The aim of the research problem is to determine the factors that affect in cost of apple production which is expressed more in apple surface, in the combination of the apples surface with irrigation, in productions, in the quantity of fertilizers used, in works day, in the combination of type of orchard and the irrigation and to knows the measures by the farmers to make predictions about cost of apples production.

[2] FAO 2016 http://www.fao.org/3/a-au044e.pdf
[3] Vjetari I Statistikes 2017. INSTAT

Data

Sources with important information from where we collected the primary data are 150 farmers in Korça district. The study was conducted at econometric level. In this paper, we are focused on analysing the impact of the econometric production factors. Problem empirical analysis is based on the use of econometric statistical methods, using Eviews program.

Problem analysis

The main objective of the study is to identify and analyze the determinants of cost of apple production in Korça area.

The reviewed model in our study is the link between cost of apple productions and economic indicators. We have used the least squares regression of log output (value added) on a constant and the logarithm of labor and capital produce parameter estimates of a Cobb-Douglas production function.

• H1 - with the increase of the level in apple planted surface at farm level, the level of cost of apple production;

• H2 - with the increase of apple surface with irrigations, the level of cost of apple production increase;

• H3 – with the increase of production at farm level, the level of cost of apple production increase;

• H4 – with the increase of the quantity of fertilizers used at farm level, the level of cost of apple production increase;

• H5 – with the increase the days of work at farm level, the level of cost of apple production increase;

• H6 – with the increase of type of orchard and the irrigation, the level of cost of apple production increase;

$$\textbf{Log Y = B0 - Bi log X1 + B2 X2 + B3 log X3 + B4 log X4 + B5 log X5 - B6X6 + U}$$

Where

Y = Cost of apple productions

Xi = Apple surface

X2 = **SMU**- Is the combination of the apples surface with irrigation

X3 = Productions.

X4 = Quantity of fertilizes.
X5 = work day (days)
X6 = **TPU -** is the combination of type of orchard and the irrigation.
U = Disturbance term.
Bo, Bi . . . . B6 are the parameters to estimate. The above model was estimated by the Heteroscedacity method.

Table 1.

Dependent variable: l_Total cost HSC	Coefficient	Std. Error	t-ratio	p-value	
const	8.955	0.133228	67.2157	<0.00001	***
l_ Apple surface	-0.084	0.04102	-2.0357	0.04362	**
SMU	0.034	0.0043477	7.8944	<0.00001	***
l_Production	0.079	0.026571	2.9583	0.00362	***
l_Qfertilizes	0.549	0.0437747	12.5513	<0.00001	***
l_workday	0.275	0.0294377	9.3427	<0.00001	***
TPU	-0.027	0.00927936	-2.8819	0.00456	***

*** Level of significance 0.05;*
**** Level of significance 0.001;*

Sum squared resid	263.0101		S.E. of regression	1.356183
R-squared	**0.952437**		Adjusted R-squared	0.950441
F(6, 143)	477.2548		P-value(F)	6.44e-92
Log-likelihood	-254.9576		Akaike criterion	523.9151
Schwarz criterion	544.9896		Hannan-Quinn	532.4770

The regression coefficient is consistent with economic logic, which means that the correlation between the variables is co-existing. $\boldsymbol{R^2}$- The coefficient of determination 0.95 shows that 95 % of the general variation (% of the probability to alleviate productivity) is defined by the caused variation by the factors that we have specified in the model. $\boldsymbol{R}$- Correlation coefficient $\boldsymbol{R = \sqrt{0.95 =}\ 0.98}$, an indicator that is close to 1, which shows a strong positive linear connection between the possibilities to increase the cost of apple production with the independent variables.

As per F- value, the fitted regression model was statistically significant at 5% level.

CONCLUSIONS

The six variables includes apple surface, the combination of the apples surface with irrigation (SMU), production, quantity of fertilizes, work day miscellaneous expenditure significantly influence in the apple production. One percent increase in variables such as the combination of the apples surface with irrigation, productions, quantity of fertilizes and day work was capable of increasing the cost of apple production by 0.034 percent, 0.079 percent, 0.549 percent and 0.275 percent, the case of farmers of Korça region.

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