ECONOMIC ANALYSIS OF FACTORS AFFECTING THE PROFITS AND QUANTITY MARKETED FROM THE BARLEY CROP

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ABSTRACT

The research aims to conduct an economic analysis to determine the factors affecting the profit achieved from barley crop production, as well as to study the production and price effect on increasing the marketing percentage of the crop. Data were obtained through a questionnaire randomly collected from 130 farmers from barley farmers in Wasit Province. The effect of the yield price, the average production costs and the quantity of production on the profit of the crop using the Evewis program was estimated to be the most influential factor in the profit, as the production increase by one unit, the profit will increase by 315203 dinars. when estimation the percentage of marketing function, the explanatory factors were the productivity, price, farm size and farmers family size, their treatments were 0.23, 0.08 and 0.05 respectively. The research concluded that the marketing administrative complexities and the dwarfing of the area and the low production exposure the farmers to economic pressure that made them sell their yield to the markets where the average price is lower than the quantity marketed and thus their profits. The research recommended the need to open marketing centers in each district and support inputs and provide them at specific times, especially high-productivity cultivars.

Keywords: Profit function, Marketing percentage, Barley crop.

تحليل اقتصادي للعوامـــل المؤثـــرة في الأربـــاح والكميـــة المسوقـــة من محصـــول الشعيـــــر

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المستخـلص

يهدف البحث الى اجراء تحليل اقتصادي لمعرفة العوامل المؤثرة في الربح المتحقق من انتاج محصول الشعير , وكذلك دراسة التأثير الانتاجي والسعري على زيادة النسبة التسويقية للمحصول . تم الحصول على البيانات من خلال استمارة الاستبانة جمعت بصورة عشوائية من 130 مزارعا من مزارعي الشعير في محافظة واسط . قدر تأثير سعر الناتج ومتوسط التكاليف الانتاجية وكمية الانتاج على ربح المحصول باستخدام برنامج evewis وتبين ان متغير كمية الانتاج من اكثر العوامل تأثيرا في الربح اذ زيادة الانتاج بمقدار وحدة واحدة فان الربح سيزداد بمقدار 315203 دينار . وعند تقدير دالة النسبة التسويقية اذ كانت العوامل التفسيرية الانتاجية و السعر وحجم المزرعة وحجم العائلة الفلاحية وجاءت معلماتها 0.23 , 0.08 , 0.05 على الترتيب . وخلص البحث الى ان التعقيدات الادارية وتقزم المساحة وانخفاض الانتاج عرض المزارعين الى ضغط اقتصادي جعلهم يبيعون حاصلهم الى الاسواق التي يكون فيها المتوسط السعري منخفض مما تقل الكمية المسوقة وبالتالي ارباحهم وعليه اوصى البحث بضرورة فتح مراكز تسويقية في كل قضاء ودعم المدخلات وتوفيرها بالأوقات المحددة لا سيما الاصناف ذات الانتاجية العالية.

كلمات مفتاحية : دالة الربح , النسبة التسويقية , محصول الشعير .

1. INTRODUCTION

The purpose of the administrative decisions takes by the farm manager is to achieve an increase in profit because profits have economic significance, because the hope of profit and fear of loss is the main catalyst for productors and on the basis of profit the decisions are taken [Ali, 1984. 335]. The basic assumptions on which the product is based are to maximize profits and achieve this aim by maximizing the difference between total revenue and total cost [Donald, 1981, 39]. The concept of profit has a relation between production and production elements (Input-

output). The costs are assumed to be a demonstration of each element of the production elements involved in the production process and estimated at the value of each unit of that component, This value should show the costs of opportunities, the surplus from the use of net profits called (Pure profit), which is supposed to fade in the long term [Al-Azi, 603.2000]. This profit is also based on the low post-harvest price and the quantity marketed. Barley is one of the most important grain crops in Iraq. It is the second largest crop after wheat in terms of production and area. It is ranked fourth after wheat, rice and maize. This crop is grown in different parts of Iraq to its withstand extreme cold and frost, It also bears the relative increase in soil salinity, so it is cultivated in the northern regions for rain dependence, Where barley is grown in large areas in Iraq, where the average cultivated area 4476242.5 acres during the period (1990-2014), The average production during the same period was 795786.4 tons with low productivity with an average of 177 kg / dunum [al-Anzi, 2017]. The barley is mainly used as animal feed because it contains a good protein content of 9.2%, Sometimes human food is introduced into the brewery industry and its seeds are used to produce feed using Hydroponic [Ali et al., 2011].

Research issue

In spite of the importance of the barley harvest, there are many productive problems associated with the cultivation of this crop, which reflected on its productivity, and consequently many farmers refrain from cultivating it. This may be attributed to several factors, namely the high input prices used in the production process, Lower average price in the post-harvest period and lower marketed quantity, as well as poor utilization of resources used in the production process resulting in low profits achieved and quantity marketed.

The objectives of Research

1) Study the most important factors affecting the profit function for the production of barley.

2) Studying the production and price effect on increasing the marketing percentage of the crop.

Research hypothesis

The research is based on the hypothesis that barley farmers suffer from economic pressure that makes them market their produce directly to the market at low prices, which affects the quantity marketed and profits.

2. MATERIALS AND METHODS

The study was based on a sample questionnaire for a random sample of barley farmers in Wasit in 2014, with 130 crop growers. The data were collected through interviews with sample farmers, which included different information on production, costs and revenues as they were evaluated and analyzed using computer And the Evewis statistical program.

3. RESULTS AND DISCUSSION

First: Profit function of barley crop

The purpose of the administrative decisions taken by the farm manager is to achieve an increase in profit and reduce the cost of production, And that the question of achieving an increase in profit comes from increasing production and raising prices and reduce production costs, was estimated model profit function based on the economic theory that the profit is equal to the total revenue (total revenue) minus from it (total costs) [Samiullah et al., 2014] as follows:

$$TI = TR - TC \quad (1)$$

$$TC = V_i * X_i \,, \, TR = \sum P_1 * Q_1 + \sum P_2 * Q_2$$

$$TC = \sum P_1 * Q_1 + \sum P_2 * Q_2 - \sum V_i * X_i \quad (2)$$

Where TI: Profit, TR: Total Revenue, TC: total cost, P1: production price, Q1: quantity of production, Vi: supplier price, Xi: quantity of supplier.

From two equations (1), (2) we obtain the profit function as in the following form:

$$TI = F (P,C,Q)$$

Based on the above, the profit function model [Tufail et al., 2012], [Zidane et al., 2016] can be described as follows:

$$TI = B_0 + B_1P - B_2C + B_3Q + U_i$$

;{**Table 1:** Results of profit function of barley production

Dependent Variable: PROFIT
Method: Least Squares
Date: 11/14/17   Time: 20:54
Sample: 1 130
Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRODUCTION	315203.8	5400.860	58.36179	0.0000
PRICE	40.74218	11.08185	3.676476	0.0003
AVERGCOST	-8.302853	1.048070	-7.922041	0.0000
C	-18809126	5703763.	-3.297670	0.0013

R-squared	0.967346	Mean dependent var	5236045.
Adjusted R-squared	0.966568	S.D. dependent var	9491216.
S.E. of regression	1735412.	Akaike info criterion	31.60167
Sum squared resid	3.79E+14	Schwarz criterion	31.68991
Log likelihood	-2050.109	Hannan-Quinn criter.	31.63753
F-statistic	1244.195	Durbin-Watson stat	1.535584
Prob(F-statistic)	0.000000		

Source: The work of researchers using the Evewis statistical program.

Economic Analysis

Table 1 shows that the reference of all variables is consistent with the logic of the economic theory. The parameters of the output price and the quantity of the output are indicated by a positive sign with the profit indicating the positive relationship. The mean parameter of the production costs came with a negative signal, which means that the relationship is negative with profit. Means that the increase in the price of output by one dinar per kilogram of barley crop with the survival of other factors fixed will lead to an increase in profit by 40.774218 dinars, and increase the average production costs by one dinar per kilogram one with the survival of other factors is fixed will lead to a decrease in profit can The increase in the production of the barley crop by one unit (ton) with the remaining factors constant which will lead to a profit increase of 315203.8 dinars, and the size of

parameters of the variables indicates that the quantity produced has a very significant impact on the increase in profit.

Statistical and standard analysis

The statistical tests show that all the parameters are significant at 1% level and that the model is significant as a whole by the value of the F test of 1244.19 This confirms the importance of the variables on one hand and the realism of the function on the other. The coefficient of determination 2R reached 0.96 which means that the studied variables explained for 96% of the variances and fluctuations in the level of profits and sample and the rest is due to other variables not included in the model. In order for the model to be acceptable, standard tests were performed and problems were detected (Multi Hetro, Auto) using the ARCH, LM and Kline tests. The model is shown absence these problems as shown in Table (2).

Table 2: Standard tests to detect second-degree problems.

Heteroskedasticity Test: ARCH				
F-statistic	2.174313	Prob. F(1,127)		0.1428
Obs*R-squared	2.171379	Prob. Chi-Square(1)		0.1406

				Correlation	
	PRODUCTION	PRICE	AVERGCOST		
PRODUCTION	1.000000	-0.055836	-0.154030		
PRICE	-0.055836	1.000000	-0.186659		
AVERGCOST	-0.154030	-0.186659	1.000000		

Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	2.617831	Prob. F(2,124)		0.0770
Obs*R-squared	5.266628	Prob. Chi-Square(2)		0.0718

Source: The work of researchers using the Evewis statistical program.

Second: Effect of some factors in the marketing percentage of barley crop.

Most of the farmers, especially in farms with small areas, suffer from some economic pressures, which prompts them to market their produce immediately after harvest to provide cash income that covers part of their accumulated needs of goods and services or to pay some of the debt they had to borrow to carry out production operations and buy part of the production resources timeframe, This makes their profits affected as well as the quantity marketed on which the classification of spaces between large and small as some areas have become self-sufficient, Therefore, the marketing percentage function was described, It was found that there are a number of factors affecting the marketing sample (productivity, price, farm size, family size). Therefore, we will take the following formula:

$$Y=b_0+b_1x_1+b_2x_2+b_3x_3+b_4x_4$$

where Y: Marketing percentage, X_1: Productivity, X_2: Price, X_3: The size of the farm and X_4: The size of the peasant family.

The function was estimated using the OLS method and using the Evewis program. It was found that the logarithmic half function is the best function to pass the economic, standard and statistical tests as shown in Table (3).

Table 3: Results of the marketing percentage function.

Dependent Variable: MARKETINGPERCENTG
Method: Least Squares
Date: 12/09/17   Time: 19:39
Sample: 1 130
Included observations: 130

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPRODICTIVITY	0.041853	0.013761	3.041389	0.0029
LNPRICE	0.233994	0.376893	0.620850	0.5358
LNFARMSIZE	0.084037	0.017240	4.874406	0.0000
LNFAMILYSIZE	-0.055792	0.019498	-2.861417	0.0049
C	3.755534	4.955547	0.757844	0.4500

R-squared	0.238796	Mean dependent var		0.693082
Adjusted R-squared	0.214438	S.D. dependent var		0.143150
S.E. of regression	0.126877	Akaike info criterion		-1.253502
Sum squared resid	2.012208	Schwarz criterion		-1.143212
Log likelihood	86.47761	Hannan-Quinn criter.		-1.208687
F-statistic	9.803392	Durbin-Watson stat		1.888643
Prob(F-statistic)	0.000001			

Economic Analysis

It is noted from Table (3) that the factor of productivity was positive and this is consistent with the logic of the economic theory, as the productivity increase by 1%, the marketing percentage increases by 0.04, and this is important because of the limited land because the marketing percentage varies according to production, so the percentage of marketing change in response to the change in Productivity and that this change depends on the flexibility of production, and that the flexibility depends on the level of production and the level of production determines the level of income. As for the price factor came positive as it parameter reached 0.233, which is one of the most influential factors in the marketing percentage, The size of the farm is one of the most influential factors in the marketing percentage after the price of 0.08. When the size of the farm increases by 1%, the marketing percentage will increase by 0.08. The quantity marketed and consumed varies according to the size of the farm and the size of the production depends to a large extent on the size Farm, confirming the strong relationship between the size of the farm and the productivity of resources used as if they were a single currency with two faces. Because of the small size, the production of these sizes will be low due to the dwarfing of areas and not benefiting from the benefits of large production and thus unable to transfer production from the need for household consumption to commercial consumption as

the increase in the volume of production in the unit area can only be achieved in farms capable of Absorbing modern production techniques. While the size of the family has a negative effect, With a 1% increase, the marketing percentage will be reduced by 0.05 as the family size increases. Household consumption increases and the marketing percentage decreases, but here the barley crop is consumed for livestock purposes.

Statistical and standard analysis

The statistical results of the estimated function show that the function was significant as a whole through the F test, which has a value of 9.8 and this confirms the reality of the function on the one hand and the importance of the variables studied on the other hand, The significance of the variables indicated by the t-test were all significant at 5% except for the price which was insignificant, The coefficient of determination 2R explained that the studied variables did not explain only 23% of the fluctuations in the marketing percentage and the rest is subject to other factors not included in the model, which is many, although the analysis contained part of them but deleted because they do not serve the objectives of the research, The second class problems were identified by the problem of the Instability of contrast homogeneity, the problem of the self-correlation and the problem of linear multiplicity. The tests revealed that the function is free from the problems mentioned according to the tests of the ARCH and LM and the matrix of tests.

Table 4: Standard tests to detect second-degree problems.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.640792	Prob. F(2,123)	0.5286
Obs*R-squared	1.340553	Prob. Chi-Square(2)	0.5116

Correlation			
	LNPRODICT...	LNPRICE	LNFARMSIZE	LNFAMILYSIZE
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LNPRODICT...	1.000000	-0.013015	0.112881	0.021463
LNPRICE	-0.013015	1.000000	-0.066110	-0.048689
LNFARMSIZE	0.112881	-0.066110	1.000000	0.692808
LNFAMILYSIZE	0.021463	-0.048689	0.692808	1.000000

Heteroskedasticity Test: ARCH

F-statistic	0.738917	Prob. F(1,127)	0.3916
Obs*R-squared	0.746212	Prob. Chi-Square(1)	0.3877

The research concludes that the low production of barley harvest due to the cultivation of non-good varieties is usually rounded out from last year's production and dwarfing areas make it difficult to take advantage of the advantages of large production and make the farms need financial liquidity and with administrative marketing complications and lower average price in the post-harvest In an economic situation that results in a decrease in the quantity marketed and consequently a decrease in profits, Therefore, the research recommends the need to support farmers with varieties of high productivity and fertilizer that can reduce the difficulty of horizontal expansion with the opening of marketing centers in each district contribute to increase the quantity marketed and increase profits at the same time.

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