RESEARCH ARTICLE **(Open Access)**

Impact of Apple Cultivar "Starking" Profit Rate with Average Market Rate in Retail Trade: Case of Albania

MERITA MARKU[1*], ARIF MURRJA[2]

[1]PhD Student, Faculty of Economics and Agribusiness, Agricultural University of Tirana, Tirana, Albania.

[2]Faculty of Economics and Agribusiness, Agricultural University of Tirana, Tirana, Albania.

Abstract

Nowadays, agricultural products are increasingly faced with the price fluctuation risk, which has become one of the main risks, after this affects income and welfare of all value chain stakeholders from the farmer to the final consumer. In order to measure this risk, the market risk management of agricultural products was assisted. In this study we have received the ''Starking'' apple retail trade of Dibra Municipality in Albania. The main purpose of this study is to analyze the impact of the gross profit rate of ''Starking'' apple cultivar retail trade with the average market rate. It was used the determination coefficient to evaluate their impact strength. Initially, the retail prices were found in the period of time January – December 2016, these data were received by the Statistic Office, Dibra Agriculture Directory. Data processing is carried out using Excel software. Referring to the data analysis, it indicated that among gross profit rates have no strong impact. These findings are useful not only for retail traders but also for wholesalers, farmers, policymakers and for the final consumer.

Keywords: Agricultural product market, Risk management, Gross profit rate, Determination coefficient.

1. Introduction

The apple market plays a very important role in the economic development of Albania, as it turns out that apples provide about 35% of income from orchards. Dibra County is one of the most favored geographical areas for apple cultivation. The apple market faces in its daily life with the risk of price fluctuations. Risk is a very important concept, not just for business but also for the individual, government and society as a whole. Many scholars and professors have studied different risk theory. Even though they express themselves in different forms, the purpose of risk in the economic or business context is the same. According to Holton, the risk is an exposure to a situation where the person is unsafe [3]. The meaning of the risk according to professors Murrja and Meco [1] is related to the use of funds, especially monetary and financial means, to provide profits or other forms of benefits such as dividends, interest income, income from rent. Once we know the risk we need to measure and value it through risk management. The risk management process is a decision-making process aimed at minimizing undesirable impacts that have potential losses for an individual or business entity [1]. The risk management process by different authors or researchers goes through 5 stages, such as: i) Identification; ii) Assessment, iii) Treatment, iv) Consultation and Counseling; and v) Control and Monitoring. We have to analyze this process in five different perspectives and concretely as:

a. Production risk, b. Financial risk, c. Market Risk d. Legal risk, e. Human Risks

Our focus is the analysis of the market risk management process. Factors that affect in market risk [1] are:

a. Price of products (products), b. Transportation Fee (Cost), c. Fuel Price, d. Interest rate, e. Domestic currency exchange rate with other currencies.

The above mentioned factors are the same for all types of businesses, whether industrial or agricultural. Due to the specificities of agricultural products, the enormous impact on market risk has the refrigeration storage costs. For example, apples that will be marketed throughout the year, they should not be kept only in refrigerated conditions, but also should be transported with freezer vehicles. However, our focus is the price of products (the ''starking'' apple price) and recognizing apple retail prices and market prices, we also find the gross profit rate. In this study, we used the determinant coefficient to measure the impact force of

*Corresponding author: Merita Marku; E-mail: merita_marku@yahoo.com
(Accepted for publication March 20, 2018)
***ISSN**: 2218-2020,*

the gross profit rate of ‘’Starking’’ cultivar retail trade with the market gross profit rate.

2. Material and Methods

The data

In order to measure the risk of the gross profit rate of ‘’Starking’’ cultivar and their impact on the market gross profit rate, we used and analyzed the following statistical data: apple retail prices for the 12 months of 2016 of Dibra Municipality (Dibra County [4] has 4 Municipalities: Bulqiza Municipality, Dibra Municipality, Klos Municipality, Mat Municipality, and in this study we received Dibra Municipality). In five days, each month, on different dates, daily retail prices are evidenced and recorded. There are altogether 60 retail price observations. These data would be given in Table A.1 in the Annex as an appendix to the dissertation (Source: Statistic Office, Dibra Agriculture Directory, 2016). If you want to measure the impact force of the market gross profit rate unto the gross profit of a commodity, use the determination coefficient.

The determination coefficient [2] is calculated as follows:

$$r^2 = \frac{b^2 \sum x^2}{\sum y^2}$$

The values of *b, x* and *y* are unknown. Initially to find this coefficient we need to find the data and apply the following formulas:

2.1 The apple retail prices

We used 60 observations (densities) for the whole period of 2016.

2.2 Measuring the risk of gross profit in the retail trade of Starking cultivars and their impact on the market rate.

Based on IAS.2 [5], gross profit is the difference in the sale price at the purchase price. Thus, it will not include: sales costs; administrative costs; expenditures from financial activity and other expenses. Also there are not included the losses from damage and decay etc. These losses are not noticed only in apple, but also in fruit and vegetables, they are generally high in percentage. In this study we will calculate the average gross profits of the market and Starking cultivars in retail trade.

2.3 Linking the gross profit rate of the "Starking" cultivar with the market rate (Regression Equation)

To explain the correlation between the profit rate in the retail trade of the "Starking" with the market rate, the regression equation applies. The linear regression analysis is enabled by the following equation [2]:

$$y = a + bx$$

where:

y-is the dependent variable (‘’Starking’’cultivar profit rate)

x-is the independent variable (market profit rate)

a-represents the intersection with the vertical axis (of the ypsilons)

b-represents the slope of the line

The formulas ***a*** and ***b*** [2] are as follows:

$$\boldsymbol{a} = \bar{y} - b\,\bar{x} \;\; and \;\; \boldsymbol{b} = \frac{n\sum xy - [(\sum x)(\sum y)]}{n\sum x^2 - (\sum x)^2}$$

where, n-number of observation cases.

Once we implement these steps we are ready to find the value of the determination coefficient.

2.4 Calculation of the determination coefficient [2]

$$r^2 = \frac{b^2 \sum x^2}{\sum y^2}$$

The values of r^2 when closer to number 1 the impact is strong and when they are farther than 1 the impact is poor.

3. Results and Discussion

The market risk of agricultural products is threatened by the fluctuation of their supply. Factors affecting the supply fluctuation in production of agricultural products are weather, disease and pests. The supply fluctuation affects directly in under or over production of agricultural products.

The following figure shows the total output per ton for the period 2012-2016. (Source: Statistic Office, Dibra Agriculture Directory). From Figure 1, we noticed the fluctuation of apple production, as from 2012 -2013 there has been an increase in production with 1412 tons of apples, then for the next two years 2014 and 2015 decline of production, and then its increase. This instability has come as a result of adverse weathering and/or impact of diseases and pests.

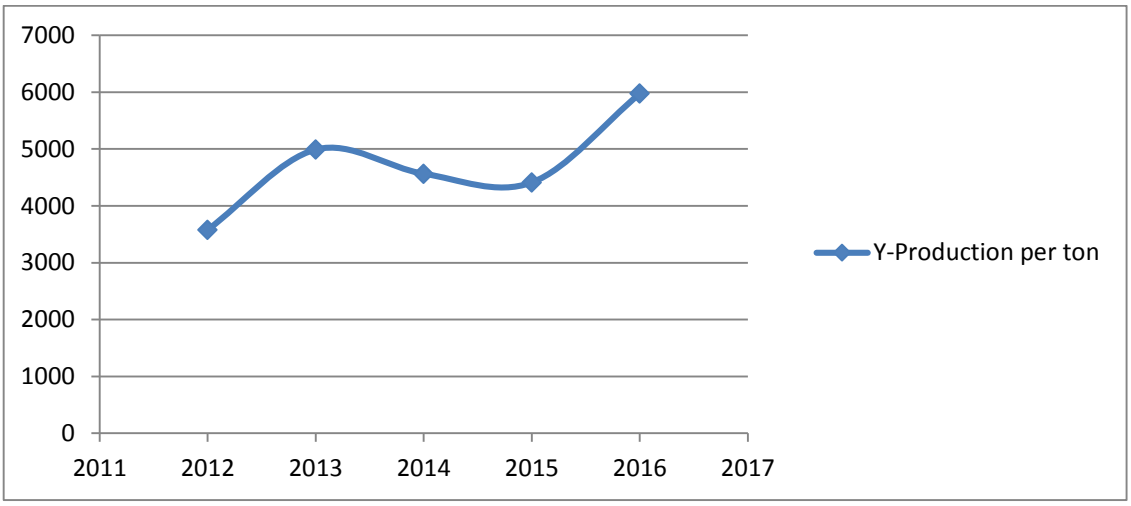

Figure 1. The fluctuation of total apple production in Dibra Municipality

3.1. Calculation of the apple retail prices

Table 1. shows that the minimum retail price is 55 All/kg and the maximum price is 150 All/kg. In this study we have a total of 60 observations or densities. The most frequent denser is 15 at the price of 130 All/kg.

Table 1. Calculation of retail prices by densities (All/kg)

No.	Price (x)	Density (f)
1	***2***	***3***
1	55	1
2	60	1
3	70	14
4	75	1
5	80	6
6	90	1
7	100	8
8	110	1
9	120	6
10	130	15
11	135	2
12	150	4
Amount (Σ)		**f=60**

3.2 Measuring the risk of gross profit in the retail trade of Starking cultivar and their impact on the market rate

Table 2 shows that although the average gross profit rate is 28.81% for both the retail trade and the market, there is a significant change in the potential profit rates. Possible rates of gross profit for retail trade of "Starking" cultivar are less concentrated around the average profit rate than the lowest possible values (7.88% to 28.81%) and the highest possible values (28.81% to 52.68%), while reverse occurs with the market. As retail trade fluctuations are greater, profit rates are more risky, while market fluctuations are lower, so profit rates are less risky. Specifically, the gross profit average of the market and the cultivar in retail trade are reflected in the Table 2.

3.3 The results of the regression equation

Columns 2 and 3 of Table 3 reflect the correlation of the ‘’Starking’’ cultivar profit rates in retail trade with the market profit rates for 2016. The data from this table help us to calculate the value of *a* and *b* and then the regression equation.

Table 2. Calculation of average gross profit rates (%)

Nr.	Average Gross Profit Rates		
	Market	**Average**	**Starking**
1	19.38	28.81	7.88
2	20.00	28.81	8.50
3	21.54	28.81	10.04
4	22.22	28.81	10.72
5	22.37	28.81	10.87
6	22.62	28.81	11.12
7	22.73	28.81	34.23
8	34.29	28.81	45.79
9	39.73	28.81	51.23
10	39.81	28.81	51.31
11	39.86	28.81	51.36
12	41.18	28.81	52.68
Amounts	**345.71**	**345.71**	**345.71**
Average	**28.81**	**28.81**	**28.81**

Table 3. Calculation of simple linear regression

No. (n)	Gross Profit Rates		x^2	y^2	x*y
	Market (x)	**Starking (y)**			
1	***2***	***3***	***4***	***5***	***6***
1	0.19	0.08	0.37	0.01	0.0153
2	0.20	0.09	0.04	0.01	0.0170
3	0.22	0.10	0.05	0.01	0.0216
4	0.22	0.11	0.05	0.01	0.0238
5	0.22	0.11	0.05	0.01	0.0243
6	0.23	0.11	0.05	0.01	0.0252
7	0.23	0.34	0.05	0.12	0.0778
8	0.34	0.46	0.12	0.21	0.1570
9	0.40	0.51	0.16	0.26	0.2035
10	0.40	0.51	0.16	0.26	0.2043
11	0.40	0.51	0.16	0.26	0.2047
12	0.46	0.53	0.21	0.28	0.2443
Amounts	**3.5091**	**3.4571**	**1.4655**	**1.4510**	**1.2187**
Aver. X	**0.2924**				
Aver. Y		**0.2881**			

Calculation of e *b*:

$$b = \frac{n\Sigma xy - [(\Sigma x)(\Sigma y)]}{n\Sigma x^2 - (\Sigma x)^2} = \frac{12\,(1.2187\,) - (3.509\,)(3.4571\,)}{(12\,)(1.4655\,) - (3.509\,)^2} = 0.4729$$

Calculation e *a*:

$$a = \bar{y} - b\bar{x} = 0{,}2881 - (0{,}4729\,) * 0{,}2924 = 0.1498$$

then:

$$y = 0.1498 + 0{,}4729 * x$$

The regression equation y = 0.1498 + 0.4729 * x serves as the predictor of the profit rate for the "Starking" cultivar in the future. For example, if the gross profit rate of the market is 20%, the gross profit from the retail trade of "Starking" cultivar will be:

$$y = 0.1498 + 0{,}4729 * 0.2 = 24\,\%$$

3.4 The impact analysis of the gross profit rate of "Starking" cultivar with the market profit rate

The determination coefficient is calculated as follows:

$$r^2 = \frac{b^2 \Sigma x^2}{\Sigma y^2} = \frac{0,2236 * 1,4655}{1,4510} = 0.2258$$

From the above $r^2 = 0.226$, the market profit rate has not a strong impact on the "Starking" cultivar profit rate because its value is far from 1, indicating that there is no high fluctuation between the gross profit rates.

4. Conclusions

This study is the first attempt to evaluate the impact of the gross profit rate of the ‘’Starking’’ apple cultivar with average market rate in retail trade using the January-December 2016 monthly data of Dibra Municipality. To evaluate this impact it was used the determination coefficient, which we divided into several steps: sales prices, gross profits, regression equation and determination coefficient.

During the data analysis the following value came out: $r^2 = 0.226$. From the study results that $r^2 = 0.226$ has not a strong impact, so the ‘’Starking’’ cultivar profit is not affected by the average market profit. This value is positive after fluctuations among profit rates are low, indicating that retail trade and market have not a big margin in the selling prices of ‘’Starking’’ cultivar, so market rules are respected. These findings are useful not only for retail traders but also for wholesalers, farmers, policymakers and for the final consumer. In the future research can be used other models like VAR to notice the apple price fluctuation in relation to other products.

5. References

1. Murrja A, Meço M & Mehmeti G: **Risk Management;** 2017: 111, 128, 220.
2. Murrja A, Meço M & Mehmeti G: **Risk Management.** In: Risk as Opportunity of Profit or Loss**,,**2017; 151-154.
3. Agalliu A. **Measurement of Credit Risk and Determining Factors in Credit Risk Indicators.** PhD Disertation. Alexander Moisiu University, Durrës, Albania. 2014: 15.
4. Counties of Albania: **Dibra County, Dibra Municipality**; in **https://sq.wikipedia.org/wiki/Qarqet_e_Shqipërisë**: 2017;1.
5. Inventories: **International Accounting Standard 2.** © IASCF . In www.kkk.gov.al/foto/uploads/File/SNK/IAS%202%20ALB%20final.pdf :2006; 1-15.