A COMPARITION BETWEEN ORGANIC PRICES AND CONVENTIONAL FOOD PRICES

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Organic prices are rising for many of the same reasons affecting conventional food prices: higher fuel costs, rising demand and a tight supply of the grains needed for animal feed and bakery items. In fact, demand for organic wheat, soybeans and corn is so great that farmers are receiving unheard of prices. The price of organic animal feed is so high that some dairy farmers have abandoned organic farming methods and others are pushing retailers to raise prices more aggressively. Organic food is typically 20 percent to 100 percent more expensive than a conventional counterpart.

The methodology used is economic/financial evaluation, which considers the value of money over time (NCV- IRR analysis), regardless of an initial approximation of its viability through an estimate of growing costs.

Key words: *organic prices, NCV- IRR analysis*

The objective of the present report is to try to ascertain the economic and financial viability of organic growing systems, compared with conventional systems.

Increased interest in environmental issues has sparked a significant movement in favour of organic or ecological farming. This is because organic farming involves several environmentally friendly growing methods and also responds more effectively to consumers' growing interest in dietary health.

The agricultural producers of European Union have been demonstrating an interest in such farming systems, on the grounds that such systems meet the demands of modern society more effectively and are also likely to receive strong institutional support.

The conversion period from the conventional products to the ecological products is two years minimum. The conversion process to ecological agriculture has not been simple, by the lack of indicators concerning the market for such products.

This requires dynamic financial evaluation methods which consider the value of money over time since, these are economic activities with a time horizon of more than one year.

First concern will be to estimate the costs of organic farming compared with conventional farming and second, will then be to set up a frame of anticipated yields and prices.

After we have made the necessary general and specific assumptions, we shall calculate viability indicators: Net Current Value (NCV), Internal Rate of Return (IRR) and Recovery Period (RP).

MATERIAL AND METHOD

We have to define the elements making up the technical and economic parameters.

We're analyzed the conventional and ecological apples production of a Fileşti farm from the region of Galaţi, belonged the "Tilitrans Holdings" company. This farm has a surface area of 5 ha, but just on 0,5 ha is apples trees.

We took data from evidences belonging to few plots of analyzed farm, with the sole difference that on some plots they have used organic farming methods and on the others conventional methods.

The economic and financial evaluation, whose main indicators are Net Current Value, Internal Rate of Return and Recovery Period, suppose an initial series of generally accepted assumptions, designed to simplify the process of evaluation.

Those assumptions are:
- receipts and payments are recorded at the end of each year. In this way, we can prepare updated figures on an annual basis. Under normal inflationary conditions, in developed countries, this does not impose any significant limitations;
- the cost of capital may be used as an interest rate for the purposes of calculation;
- the technical and economic variables will ultimately define the economic parameters of the investment that we are going to evaluate. This is undoubtedly the most restrictive assumption used in evaluating the profitability of any farming asset, and especially of the asset that concerns us in this study. If there is anything that defines farming activity in general, and apples farming in particular, it is the necessity to assume risk, with respect both to one's own production (agronomic risk) and the prices one is able to charge (market risk);
- -in the case of already established crops, conversion to organic farming occurs in the tenth year, as is becoming common on farms changing to this growing system in the region under consideration in this study, with a two-year conversion period, fixed by current regulations. In the case of new plantings, note that another option to be borne in mind is to use conventional farming methods during the training period and perform the conversion during the first two years of the productive period. This is not the case in the present study, since most farms currently using organic farming methods have performed the conversion according to the method outlined abov;
- farming machinery is rented, because these are small farms, divided into small plots, and so renting is the customary practice;
- the planting frame is 5 x 3, since this is the frame that is becoming most popular for apples production in the region addressed by this study;
- two productive periods are used, covering the life of the farm: the training period and the full-production period, in which we estimate a constant average annual sold product (productive yield). The first period lasts for 5 years and the second for 20 years.

The indicators and how they are formulated:

Net Current Value (NCV) - is the difference between the cost of investment, which comprises both the cost of the planting proper and the discounted payments of the so-called training period, and the discounted cash flows, which represent the difference between receipts and payments. The formula used to obtain this value is the following:

For conventional farming:

$$NCV = -K_0 - \sum_{j=1}^{3} \frac{P_j}{(1+i)^j} + \sum_{j=4}^{25} \frac{q_j p_j - P_j}{(1+i)^j}, \quad \text{unde:}$$

K_0 = cost of investment.
P_j = payments made throughout the life of the investment.
q_j = production achieved.
p_j = price.
i = discount rate.

For organic farming:

$$NCV = -K_0 - \sum_{j=1}^{3} \frac{P_j}{(1+i)^j} + \sum_{j=4}^{9} \frac{q_j p_j - P_j}{(1+i)^j} + \sum_{j=10}^{14} \frac{q_{0j} p_j - P_{0j}}{(1+i)^j} + \sum_{j=12}^{25} \frac{q_{0j} p_j - P_{0j}}{(1+i)^j}$$

K_0 = cost of investment.
P_j = payments made with conventional growing system.
q_j = production achieved with conventional growing system.
p_j = price of product marketed as conventional.
P_{oj} = payments made with organic growing system.
q_{oj} = production achieved when growing system is organic.
p_{oj} = price of product marketed as organic.
i = discount rate.

Internal Rate of Return (IRR), which is defined as the interest rate that, as a discount rate, would give an NCV of zero.

For conventional farming:

$$0 = -K_0 - \sum_{j=1}^{3} \frac{P_j}{(1+i)^j} + \sum_{j=4}^{25} \frac{q_j p_j - P_j}{(1+IRR)^j}$$

For organic farming:

$$0 = -K_0 - \sum_{j=1}^{3} \frac{P_j}{(1+i)^j} + \sum_{j=4}^{9} \frac{q_j p_j - P_j}{(1+IRR)^j} + \sum_{j=10}^{14} \frac{q_{0j} p_j - P_{0j}}{(1+IRR)^j} + \sum_{j=12}^{25} \frac{q_{0j} p_j - P_{0j}}{(1+IRR)^j}$$

Recovery Period (RP), which is defined as the time needed to recover the cost of the investment.

For conventional farming:

RP = H, where $K_0 = \sum_{j=1}^{3} \frac{P_j}{(1+i)^j} + \sum_{j=4}^{H} \frac{q_j p_j - P_j}{(1+i)^j}$, unde:

H – recovery period
For organic farming:
RP = H, where

$$K_0 = \sum_{j=1}^{3} \frac{P_j}{(1+i)^j} + \sum_{j=4}^{H} \frac{q_j p_j - P_j}{(1+i)^j} + \sum_{j=10}^{H} \frac{q_{0j} p_j - P_{0j}}{(1+i)^j} + \sum_{j=12}^{H} \frac{q_{0j} p_j - P_{0j}}{(1+i)^j}$$

RESULTS AND DISCUSSIONS

In accordance with the methodology used and the economic parameters established on the basis of the general and specific assumptions, and the technical and economic elements of the project, we shall proceed to determine the selected indicators. In the case of the NCV and the Recovery Period, it is necessary to define the interest rate.

Because of the evolution in prices, due to inflation, on the one hand, and market imbalances between supply and demand, on the other, it is difficult to accept our initial decision not to include monetary variations in the flow of receipts and payments generated by the project.

With regard to organic farming methods, it cannot be denied that this form of agriculture is profiting from a series of subsidies which represent an extraordinary receipt that affects financial profitability, and thus the viability, of this option.

The selected profitability indicators were determined according to two working hypotheses:

- Hypothesis 1: Hypothesis of non-inflationary markets.
- Hypothesis 2: Hypothesis of saturated conventional markets.

Table 1

Results for apples on the non-inflationary markets

	Conventional system		Organic system	
	RIR	15,14%	RIR	14,22%
Discount rate	NCV	RP	NCV	RP
3%	3033534	9	2037657	10
4%	2045690	9	1046532	10
5%	1232448	9	398234	11
6%	976576	11	173826	12
7%	914532	11	103476	13
8%	867534	11	76849	14

Table 2

Results for apples on the saturated conventional markets

	Conventional system		Organic system	
	RIR	11,24%	RIR	9,32%
Discount rate	NCV	RP	NCV	RP
3%	1093584	11	98657	14
4%	545668	12	36545	15
5%	52456	12	17639	15
6%	34325	13	9232	16
7%	14522	14	6785	18
8%	7534	14	4512	21

Results according to Hypothesis 2 also show scarcely any differences, either for apples, although, under this hypothesis, profitability rates do fall slightly in all cases. Although they may still seem somewhat high, we must remember that we are not considering risk, since we accept the context of certainty.

Paradoxically, although prices of products sold as organic are significantly higher than those of conventional products, a significant proportion of those products are sometimes sold as conventional farming products (among fruits in general, the figure is around 10%). As long as organic production continues to grow, that proportion may increase if the appropriate marketing channels are not found.

This first analysis shows quite clearly the enormous sensitivity that variations in product prices, and thus variations in receipts, implies in terms of profitability rates, especially in the case of organic apples production, where a 20% fall in the price of this product would hit profitability so hard that it would fall to negative levels.

In order to express more clearly the comparison between organic and conventional farming of apples, we have provided, below, the profitability rates according to five different market hypotheses:

1. Markets with a very strong preference for organic farming (price differences between organic and conventional farming is 40%).

2. Markets with a strong preference for organic farming (price differences between organic and conventional farming is 30%).

3. Markets with preference for organic farming (between organic and conventional farming is 20%). This hypothesis is the one initially regarded, for the purposes of this study, as the closest to the present price scenario.

4. Markets with slight preference for organic farming (price differences between organic and conventional farming 10%).

5. Markets without preference for organic farming (no price differences between organic and conventional farming).

CONCLUSIONS

Economic comparison of organic and conventional apples farming should be performed in light of the fact that apples is a perennial crop, which means that the most appropriate methodology must take into account the entire useful life of the grove, as well as different market scenarios.

Production costs highlight the need for a higher price for the organic product, since the costs are greater - 27.9% and the yields are lower, especially during the conversion period -19.4%.

Due to the difficulty in predicting the evolution of markets and, in particular, that of the prices that organic products might reach, we had to simulate different price scenarios that would allow us to discern under what conditions the estimated profitability for organic farming would be higher or, at least, comparable.

Results indicate that only in a context of strong and very strong preference - that is, with prices for organic apples 30% and 40% higher than for conventional apples - can organic farming show higher profitability. In the case of the hypothesis of simple preference (initial hypothesis), which is the present situation, the profitability rates are, as we have already mentioned, in favor of conventional farming.

Organic apples growing will gain ground over the coming years, although how fast it grows will depend on the evolution of the market, and the practical impact that institutional support has on the apples -growing industry. In the short term, however, it does not seem that a major shift toward organic farming is justified.

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