



APPLICATION OF THE “COST-VOLUME-PROFIT’ ANALYSIS IN THE AGRICULTURAL SECTOR – PROBLEMS AND SOLUTIONS

Teodora Roupska¹

Abstract: The “Cost-Volume-Profit” (CVP) analysis is a well known Management Accounting tool applicable in industrial companies. It can be applied successfully in agrarian companies, but it is necessary to identify fixed and variable costs (in Bulgaria it isn’t done), made for raising animals or growing plants, because the agrarian production is made from biological assets. The costs made for plants or animals are different. Besides the same cost in the individual companies are able to be classified differently depending on its particular manifestation. The “Cost-Volume-Profit” analysis can easily be used to base agrarian companies’ management decisions as in the other companies – by computing break-even point, by computing margin of safety and etc. In our empirical study it is possible to compute the break-even point in units in two versions. In the first the unit is an animal and in the second – a kilogram of meat. The received results proved that to organizing a profitable pig farm in Bulgaria it is necessary to have more than 898 animals.

INTRODUCTION

The “Cost-Volume-Profit” analysis is a well known Management Accounting tool. It helps the managers understand the interrelationship between cost, volume and profit in the enterprises. CVP analysis is a tool for many business decisions. It can be applied successfully in agrarian companies.

We present the results of our research for practicability of CVP analysis in agrarian companies in this paper. We are focusing on possible problems and proposing solutions. CVP analysis is possible only for activity based on managing current biological assets in agrarian companies, due to the analysis’s limitations.

Not the most highly qualified accountants work in Bulgarian agrarian companies (We make a study of 50 agrarian companies. 63 accountants are working here. 10 have bachelor’s degree, 4 – master’s degree and the others graduated secondary economic schools.). That is why it is impossible to use sophisticated Management Accounting’s tools in Bulgarian agrarian companies. The average age of the 63 accountants is about 57 years. This fact is important, because till 1995year, Management Accounting has not studied in Bulgaria.

THEORIRICAL STUDY

To apply the CVP analysis it is necessary to establish information about fixed and variable costs (Shim, & Siegel, 2000, p.156), inherent in a specific case. We have made a study of 50

¹Asst. Prof. Teodora Roupska, Ph. D, Department of Accounting and Analysis, University of National and World Economy, Sofia, Republic of Bulgaria, email: troupska@abv.bg

agrarian companies. They are located in different parts of Bulgaria. There is no information about fixed and variable costs in any one of them, because it isn't necessary for the financial statements (for Statement of Comprehensive Income and Balance Sheet). This problem can easily be solved. Simultaneously while the accountants record transactions for Financial Accounting's purposes, create the information for the purposes of the Management Accounting, or they prepare two separate information streams, which serve different purposes. This can be done easily by a computer program through which information from the accounts used for the completion of the financial statements is reflected for the purposes of Management Accounting. Each cost is classified as fixed or/and variable. We offer to create special reports for each type of activity in agrarian enterprises.

Typically for agricultural production is that it comes from the management of biological assets. Consequently, the costs that are incurred in connection with it are closely related to biological assets, of which it is produced (Ricketts, & Ricketts, ,2009,p.262). Statements, which will be filled, will be for cost of cultivation of the biological assets. They should have different content due to the different costs made for different biological assets – living animal and plant . We offer the statement for biological assets – living animals to contain the following:

Statement for fixed and variable costs for biological assets – living animals

Table № 1

Manufacturing costs	Total costs	Fixed cost	Variable costs
1. Material <ul style="list-style-type: none"> • Fodders • Litters • Medicines • Water • Others 			
2. Payable to other companies <ul style="list-style-type: none"> • Veterinary surgeons • Electricity • Insurance • Others 			
3. Depreciation			
4. Labour and social insurance			
5. Others			
6. Costs for acquiring of biological assets			
7. Overhead			
Total			

It is necessary to prepare a separate statement for each kind of living animals raised in a company, because they have different economic-biological features. It determines the specificity of the costs that occur in connection with their raising. In individual companies the same costs may be present in different rows in the report. For example, if there is a veterinary who works in a company, the cost for him/her will be direct labour cost. But if the agrarian company has a contract

for veterinary surgeon with a veterinary clinic the cost has to be present as a cost payable to other companies.

If the agrarian company has its own water source, the costs for the water are direct material cost. But if it comes from another company the costs are classified as payable to other company.

We offer the statement for biological assets – living plants to contain the following:

Statement for fixed and variable costs for biological assets – living plants

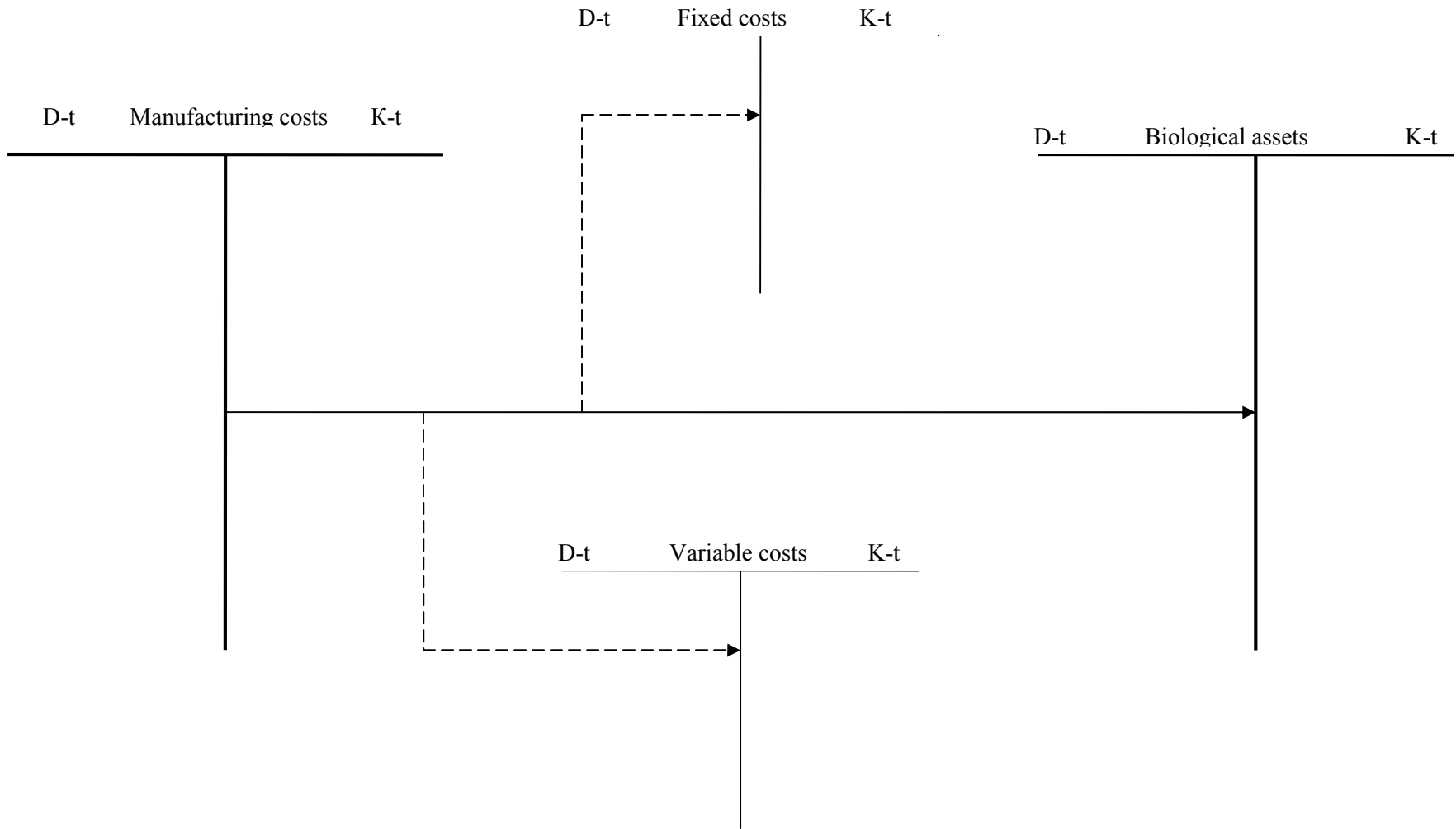
Table № 2

Manufacturing costs	Total costs	Fixed cost	Variable costs
1. Material <ul style="list-style-type: none"> • Seeds • Composts and fertilizers • Water • Preparations for plant protection (Chemicals) • Oil • Others 			
2. Payable to other companies <ul style="list-style-type: none"> • Rents • Agricultural aviation • Scientific agriculturist service • Insurance • Others 			
3. Depreciation			
4. Labour and social insurance			
5. Others			
6. Overhead			
Total			

Table № 2

As for the biological assets living animal, the costs made for various plants are different, and a separate report should be prepared for each one of the plants growing on the farm – wheat, maize, sunflower and etc.

The relationship between accounts is shown on the following figure (the scheme is analogous to biological assets of plant and animal origin):



EMPIRICAL STUDY

Enterprise "A" is an agrarian company. 4224 fattening pigs are raised in it (The information is posted in the accounting journals). When they reach an optimum weight of 90 kg they are expected to be sold. When they enter the fattening unit (department of fattening) they are young animals - current biological assets. The young pigs are transferred to the animals for fattening at the age of four months, at an average weight of 40 kg per animal. Then they are subjected to a special diet for fattening, for a five month period (150 days). The average weight of an animal is 90 kg at the end of the period.

A statement for fixed and variable costs for pigs contains the following:

Table №3

Manufacturing costs	Total costs TC	Fixed cost FC	Variable costs VC
2. Material	457 901		457 901
• Fodders	349 103		349 103
• Litters	63 360		63 360
• Medicines	26 611		26 611
• Water	18 827		18 827
• Others			
2. Payable to other companies	17 140		17 140
• Veterinary surgeon	15 340		15 340
• Electricity	1 800		1 800
• Insurance			
• Others			
3. Depreciation	10 000	10 000	
4. Labour	64 000	4 000	60 000
5. Social insurance	45 000	2 813	42 187
6. Others	600		600
7. Costs for obtaining biological assets	268 960		268 960
8. Overhead	2 500	2 000	500
Total	866 101	18 813	847 288

To compute break-even point we compute the average costs per unit (living animal or kilogram meat).

Compute: $\frac{847288}{4224} = 200,59$ levs (the result is in Bulgarian currency) variable costs per unit

living animal.

We can compute variable costs per unit kilogram meat (average weight of animal is 90 kilograms): $\frac{200,59}{90} = 2,23$ levs variable costs per unit kilogram meat.

90

$$\begin{aligned} \text{After that we compute BE in units (living animal)} &= \frac{a}{m} = \\ &= \frac{18813}{221,56 - 200,59} = \frac{18813}{20,97} = 897,14 \text{ animals} \approx 898 \text{ animals} \end{aligned}$$

To compute BE in units when the unit is kilogram meat:

$$\text{BE in units (kilogram meat)} = \frac{a}{m} = \frac{18813}{2,46 - 2,23} = \frac{18813}{0,23} = 81\,795,652 \text{ kilograms meat}$$

To compute BE in levs

BE in levs = BE in units (kilogram meat) . p,

where p is the sell price per units. We are using statistical data for prices. Sale price for producers is 2 461, 76 per ton meat. Or 81 795,652 kg : 1 000=81,7957 tons.

BE in levs = 81,7957 ton . 2 461,76 levs =

= 201 361, 38 levs

The received results break up the illusion to organizing the profitable small farm (for example with 50 animals only). The myth that it is possible is very popular in Bulgaria. Unfortunately, many people understand that too late – when they lose money and time.

REFERENCES

1. Ricketts, C., & Ricketts, K., (2009) "Agribusiness Fundamentals & Applications", (2-nd ed.). New York, Delmar Cengage Learning.
2. Shim, J., & Siegel, J., (2000) "Modern Cost Management & Analysis", (2-nd ed.) New York, Barron's Business Library.