

Efficiency of factor input

The Profit and Net Profit show only whether or not the input of the factors labour, capital and land is efficient, but not how efficient the factor input is.

This chapter provides answers to the following questions:

- How high is the rate of capital return?
- How high is the rate of labour return?
- How high is the rate of return for utilized land?

To determine the efficiency of the factor input and to be able to compare the alternatives the difference between output and costs is referred to one unit of the factor, whereat the imputed costs for factors are not taken into consideration:

- DM per 100 DM of average used capital (= %)
- DM per 1 working hour (h)
- DM per 1 hectare of utilized land

The calculation of the factor return can be done as a matter of principle both for

- the total amount of used factors labour, capital and land (borrowed and own) and for
- the own factors (family labour, own capital, own land).

In the first case the costs for borrowed factors as well as opportunity costs are, therefore, not taken into account and it is divided by the total amount of used factors. In the second case only the opportunity costs of own factors are not taken into account and it is divided by the amount of own used factors.

The calculation of the factor return looks as follows:

$$\begin{aligned} & \text{Gross output (quantity of products} \times \text{price, direct payments)} \\ & - \text{all costs positions EXCLUDING the factor costs *)} \\ & = \text{Factor return per ha} \\ & / \text{Factor input per ha *)} \\ & = \text{Factor return per unit of factor input} \end{aligned}$$

*) borrowed + owned factors or only own ones

Interpretation

To be able to analyse the efficiency of factor input on the basis of the factor return the factor return should be compared with factor costs.

The factor input is profitable if the factor return is higher than the cost (or at least equal to them).

In the calculation example the efficiency of factor input is lower than the factor costs, the factor input is, therefore, not considered to be profitable in the long run. With reference to own factors it means that an alternative use could be more economically acceptable in the long run.

<u>Factor</u>		<u>Unit</u>	<u>Return</u>		<u>Costs</u>
Capital:	Total capital	%	2.5%	<	5.6%
	Own capital	%	0.8%	<	5.0%
Labour:	Total labour	€/h	7.37	<	10.15
	Family labour	€/h	7.00	<	10.00
Land:	Total land	€/ha	201.69	<	235.00
	Own land	€/ha	169.48	<	225.00

The imputed costs for total capital, total labour and total land result from the average values of the costs of borrowed factors and from the opportunity costs of own factors.

Long-term and short-term efficiency of factor input

Since the calculation is done on the basis of total costs (variable & fixed costs), all results are to be considered as a long-term efficiency of used factors. Analogically to the step-by-step calculation of the net profit in the Form 2 a short-term (that is: considering only variable costs with available fixed machinery and buildings capacities) calculation of the factor input efficiency can also be done. The indicators calculated in this way are well suited as a measure for the relative economic equisiteness of farm enterprises within the framework of the program planning of a farm with available fixed capacities.

The calculation of the short-term factor input efficiency together with calculation of all efficiency measures is shown in the calculation Form 5.

As to the factor capital it should be mentioned that in the calculation of a short-term capital return only the capital requirements for current assets are considered (unlike the total capital for a long-term capital return calculation).

Similarly, in the calculation of a short-term efficiency of labour input only labour time requirements for production (excluding general labour) are considered.

4.4 Threshold prices

The analysis of the profitability of a farm enterprise can also be done by comparing the price of the product with the unit costs of production.

The unit costs (average costs) are calculated by dividing the production costs by the production quantity.

If the costs are incurred not only by the production of one product but also by the production of several by-products, the value of the by-products must be considered in the determination of the production costs in order to achieve an adequate measure of comparison for the price of the main product. The same rule also applies if the direct payments (as non-marketable output) are included into the gross output. The reason for this correction can be easily explained:

From the above calculation it is clear that the (Net) Profit must be at least equal zero in order for the profitability limit to be reached.

The calculation of the Net profit looks (simplified) as follows: