Supplementary Materials

The marginal factor productivity (MFP)

Economics is “the science of choices in a context of scarce resources” (Herbert Simon, 1932). The understanding of human choices in contexts of scarcity of resources and the management of scarcity constitute the fulcrum, the stimulus, and the very limit of economic science. The "water and diamond paradox", which dates to Adam Smith and the discussions of the first marginalists, constitutes its emblematic synthesis. “Not everything that is very useful is always attributed a high value (for example, water) and, vice versa, not all things that have a high value are automatically very useful (think of diamonds)”. Furthermore, the concept of resource is a relative and dynamic concept, with a role and value that varies over time and space, depending on the social organization, the ability to use the resource itself, the availability, the quality, the benefits related economic aspects, the market in which it is inserted, the cultural value and the ethical value. What determines the economic value of a resource, and the related economic value evaluation methodologies is scarcity, measured at the margin. According to economic theory, in fact, value is determined by the choices of economic agents and by the scarcity of resources. In resolving the trade-off between the desired option and the constraint (determined by the scarcity of the resource), the economic agent establishes and determines economic value, often (but not always), measured and expressed in monetary terms, and always determined "at the margin”. It is not the total or average value that determines the value of, for example, a production input, but rather its incremental value (which can subsequently be “scaled up” to define the total value).

The economic value of marginal factor productivity (VPFM)

When it is not possible to estimate a production function, as for the case study in question, given the lack of relevant quantitative data and information, the marginal productivity was obtained from the calculation of the average productivity of the inputs (i.e. the unit productivity of the factors) of production (where the average productivity of the production factor (APF) is calculated by dividing the total production by the total quantity of production inputs considered, APF = Q/in), applying the well-known mathematical law that links marginal quantities to averages. Here is, in fact, a very clear relationship between average and marginal productivity. When average productivity is decreasing, the value of marginal productivity is lower than that of average productivity. When average productivity is increasing, marginal productivity is higher than average productivity. When average productivity is constant, marginal productivity is equal to average productivity. Generally, in the latter situation, the company produces in equilibrium conditions and has no incentives to vary total production. For the sake of analytical simplicity, we assume that the company under analysis finds itself in conditions of choice in which average and marginal productivity coincide.

Marginal costs values

The following values for selected input marginal costs were used.

	Labour	Energy	Water	Tools	Fuel	Nitrogen	Feed
Marginal Costs	30,000 per worker	0.25 per Kw	0.5 per m^3	2.74 per additional tool	1.79 per litre	0.73 per kg	2.3 per kg

Profit Maximization Conditions

Results of Profit Maximization Conditions were computed with the use of economic data provided by the firm that, in the period considered, amounted to 586,896 euros.